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MORACEAE: FICEAE

(C.C. Berg & E.J.H. Corner†)[1]

FOREWORD

> "Are all botanists crazy? I began to think that anyone who would bother with such a genus as *Eugenia* must be a bit off; to say nothing of those who like to play with *Ficus*." (from a letter of Merrill to Lam, 23 August 1949).

Corner (1967: 24) summarized his studies on *Ficus* as follows: Since 1930, when he began to study *Ficus* of the Malay Peninsula, he examined nearly every collection, totalling 21,000, that has been made in Asia and Australasia, and has seen over 300 species in their wild state. He reduced the 2600 specific names to c. 480. These results have been summarized in a check-list (Corner 1965).

The results were more extensively and detailed laid down in a treatment of the genus for Flora Malesiana. It was submitted in February 1972 and comprised also most of the smaller genera of Moraceae. Treatments of *Artocarpus* and allied genera were submitted by Dr. F.M. Jarrett about 10 years later. Because of disagreements between Dr. E.J.H. Corner (main author) and Dr. C.G.G.J. van Steenis (editor) nothing happened with the manuscript until Dr. C.C. Berg (first author) was asked by the successor of the editor, Dr. C. Kalkman, to use his experience from the studies on African and neotropical Moraceae to get the manuscripts updated for publication, as agreed upon, initially in cooperation with Dr. Corner.

The task proved to be far more extensive and demanding than including recent collections and new data from recent publications (as Corner 1969, 1970a, 1970b, 1972, 1975; Go 1998; Jarrett 1975; Kochummen 1998; Weiblen in Laman & Weiblen 1998). Taxonomic decisions had to be revised (species united or reinstated and the number of varieties strongly reduced), subdivisions to be remodelled, descriptions to be rewritten (moving the accent from floral parts to vegetative ones), keys to be reconstructed, and the introduction to be changed and extended. The revision of the manuscripts is largely based on the material available at L (of which the older collections were identified by Dr. Corner). Some collections, mainly types, have been borrowed from other herbaria. Checking upon nomenclature and cited literature has been done to a limited extent.

The final shaping of the taxonomy of the Malesian *Ficus* flora is entirely the responsibility of the first author, but carrying out the work by using less than three years working time, would not have been possible without the impressive founding research and sorting out of herbarium material by Dr. Corner.

References: Corner, E.J.H., Check-list of Ficus in Asia and Australasia with keys to identification. Gard. Bull. Singapore 21 (1965) 1–186. — Corner, E.J.H., Ficus in the Solomon Islands and its bearing on the Post-Jurassic history of Melanesia. Philos. Trans., Ser. B, 253 (1967) 23–159. — Corner,

1) With contributions by P. Baas (wood anatomy) and J.M. Langeveld & R.W.J.M. van der Ham (pollen morphology). Most of the original drawings are by R. van Crevel and some by E.J.H. Corner. Reviewing the introduction by F. Kjellberg (Montpellier) and by J.-Y. Rasplus (Montferrier-sur-Lez) is gratefully acknowledged.

E.J.H., The complex of Ficus deltoidea; a recent invasion of the Sunda Shelf. Philos. Trans., Ser. B, 256 (1969) 281–355. — Corner, E.J.H., Ficus subg. Ficus. Two rare and primitive pachycaul species. Philos. Trans., Ser. B, 259 (1970a) 353–381. — Corner, E.J.H., New species of Streblus and Ficus (Moraceae). Blumea 18 (1970b) 393–411. — Corner, E.J.H., New taxa of Ficus (Moraceae). Blumea 20 (1972) 427–432. — Corner, E.J.H., New taxa of Ficus (Moraceae) 2. Blumea 22 (1975) 299–309. — Go, R., A new species of Parartocarpus (Moraceae) from Sabah. Sandakania 12 (1998) 1–5. — Jarrett, F.M., Four new Artocarpus species from Indo-Malesia (Moraceae). Blumea 22 (1975) 409–410. — Kochummen, K.M., New species and varieties of Moraceae from Malaysia. Gard. Bull. Singapore 50 (1998) 197–219. — Laman, T.G. & G.D. Weiblen, Figs of Gunung Palung National Park (West Kalimantan, Indonesia). Trop. Biodiversity 5 (3) (1998) 245–297.

FICEAE

Ficeae Gaudich., Voy. Freyc. (1826) 510; Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8 (1847) 77, 138; Miq. in Mart., Fl. Bras. 4, 1 (1852) 83; Bureau in DC., Prodr. 17 (1873) 282, 287; Benth. & Hook., Gen. Pl. 3 (1880) 346; Engl. in Engl. & Prantl, Nat. Pflanzenfam. 3, 1 (1888) 88; Dalla Torre & Harms, Gen. Siph. (1900) 122; Corner, Gard. Bull. Singapore 19 (1962) 210; C.C. Berg, Proc. Kon. Ned. Akad. Wetensch. C, 91 (1998) 360.

Trees, shrubs, or climbers, monoecious or (functionally) dioecious, often with aerial adventitious roots (hemi-epiphytes and root-climbers), rarely with uncinate hairs, usually with waxy glandular spots on the lamina beneath and/or in the nodes of leafy twigs. *Leaves* spirally arranged, distichous, (sub)opposite (or subverticillate); stipules fully amplexicaul to lateral, mostly free. *Inflorescences* with an urceolate receptacle, entirely enclosing the flowers (even at anthesis), bisexual or (functionally) unisexual, pronouncedly protogynous, the orifice more or less tightly closed by bracts; interfloral bracts present; staminate flowers with (2–)3–5 (or more) tepals, stamens 1–5, pistillode absent or present; pistillate flowers with (2–)3–5 (or more) scarious tepals, these free or connate, ovary free, styles different in length (heterostyly), stigmas 1 or 2, various in shape. *Fruit* a drupelet or an achene. *Seed* with endosperm, embryo (almost) straight with flat and equal or ± curved with conduplicate cotyledons.

FICUS

Ficus L., Gen. Pl., ed. 5 (1754) 482; Sp. Pl. (1753) 1059; Gasp., Giorn. Bot. Ital. 2 (1844) 209–219; Miq., London J. Bot. 6 (1847) 514–587; 7 (1848) 64–78, 109–116, 221–236, 425–471 (monogr.); Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 214–235, 260–300 (list Old World spp.); King, Ann. Roy. Bot. Gard. Calc. 1 (1887/1888) 1–185 (monogr. Indo-Mal. spp.); Renner, Bot. Jahrb. Syst. 39 (1907) 319–448 (anat.); Diels, Bot. Jahrb. Syst. 67 (1935) 144–235 (spp. papuan.); Elmer, Leafl. Philipp. Bot. 9 (1937) 3427–3431; Sata; Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 1–405 (monogr.); Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 1–65 (sect. *Covellia* & *Neomorphe*); Gard. Bull. Singapore 10 (1939) 82–161 (subg. *Synoecia*); 17 (1960) 368–485 (subg. *Urostigma*, *Pharmacosycea* & *Ficus*); 18 (1960) 1–69 (subg. *Ficus*, contnd.); 18 (1961) 83–97 (addenda); 19 (1962) 385–401 (addenda); 21 (1965) 1–186 (check-list); Blumea 18 (1970) 393–411, 20 (1972) 427–432, 22 (1975) 299–309 (addenda); Kochummen, Gard. Bull. Singapore 50 (1998) 197–219; C.C. Berg, Blumea 48 (2003) 167–178, 289–301, 529–550, 551–571, 573–597, 49 (2004) 154 (errata), 155–200, 461–462 (additions & corrections), 463–480.

Pella Gaertn., Fruct. 1 (1788) 143 (subg. *Urostigma* subsect. *Urostigma*).

Gonusuke Raf., Sylv. Tellur. (1838) 58 (subg. *Sycomorus* subsect. *Sycocarpus*).

Necalistis Raf., Sylv. Tellur. (1838) 58 (subg. *Sycidium* sect. *Sycidium*).

Oluntos Raf., Sylv. Tellur. (1838) 58 (subg. *Urostigma* sect. *Americana*).
Perula Raf., Sylv. Tellur. (1838) 58 (subg. *Urostigma* subsect. *Conosycea*).
Tremotis Raf., Sylv. Tellur. (1838) 58 (subg. *Sycomorus* subsect. *Neomorphe*).
Varinga Raf., Sylv. Tellur. (1838) 58 (subg. *Synoecia* subsect. *Plagiostigma*).
Mastosuke Raf., Sylv. Tellur. (1838) 59 (subg. *Urostigma* subsect. *Malvanthera*).
Rephesis Raf., Sylv. Tellur. (1838) 59 (subg. *Urostigma* sect. *Galoglychia*).
Sycomorphe Miq., Ann. Sci. Nat. Bot., Sér. 3, 1 (1844) 35 (subg. *Sycomorus* subsect. *Sycocarpus*).
Caprificus Gasp., Giorn. Bot. Ital. 2 (1844) 209 (subg. *Ficus*).
Tenorea Gasp., Giorn. Bot. Ital. 2 (1844) 214 (subg. *Synoecia* subsect. *Plagiostigma*).
Urostigma Gasp., Giorn. Bot. Ital. 2 (1844) 214 (subg. *Urostigma*).
Visiania Gasp., Giorn. Bot. Ital. 2 (1844) 216 (subg. *Urostigma* subsect. *Stilpnophyllum*).
Covellia Gasp., Giorn. Bot. Ital. 2 (1844) 217 (subg. *Sycomorus* subsect. *Sycocarpus*).
Galoglychia Gasp., Giorn. Bot. Ital. 2 (1844) 217 (subg. *Urostigma* sect. *Galoglychia*).
Cystogyne Gasp., Giorn. Bot. Ital. 2 (1844) 218 (subg. *Sycomorus* subsect. *Sycocarpus*).
Erythrogyne Vis. ex Gasp., Giorn. Bot. Ital. 2 (1844) 219 (subg. *Ficus* subsect. *Frutescentiae*).
Sycomorus Gasp., Giorn. Bot. Ital. 2 (1844) 219 (subg. *Sycomorus*).
Plagiostigma Siebold & Zucc., Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4, 1 (1844) 154, nom., non Presl. (subg. *Synoecia* subsect. *Plagiostigma*).
Macrophthalmia Gasp., Rendiconti Reale Accad. Sci. Fis. 25 (1845) 83 (subg. *Urostigma* subsect. *Stilpnophyllum*).
Pharmacosycea Miq., London. J. Bot. 6 (1847) 525 (subg. *Pharmacosycea*).
Pogonotrophe Miq., London J. Bot. 6 (1847) 525 (subg. *Synoecia* subsect. *Pogonotrophe).*
Synoecia Miq., London J. Bot. 7 (1848) 469 (subg. *Synoecia*).
Bosscheria Teijsm. & de Vriese, Natuurk. Tijdschr. Ned.-Indië 23 (1861) 212 (subg. *Sycomorus* sect. *Bosscheria*).
Stilpnophyllum (Endl.) Drury, Handb. Ind. Fl. 3 (1869) 225 (subg. *Urostigma* sect. *Stilpnophyllum*).
Dammaropsis Warb., Bot. Jahrb. Syst. 3 (1891) 296 (subg. *Sycomorus* sect. *Dammaropsis*).

Trees, shrubs or climbers, often with adventitious roots (aerial in hemi-epiphytes and root-climbers), monoecious or (gyno)dioecious (functionally 'male' and 'female'); with milky and white, sometimes coloured or watery, latex, 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* spirally arranged, 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 (basal bracts, mostly 2 or 3); 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). *Figs* 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 cotyledons or ± curved with conduplicate cotyledons.

DISTRIBUTION

The genus is pantropical, extending to subtropical (or warm temperate) regions. It comprises c. 735 species, of which c. 120 in America, c. 105 in Africa (continent, Madagascar and other Indian Ocean islands, and the Arabian Peninsula), and the others in the Asian-Australasian region; 367, including five introduced ones, occur in Malesia; for the distribution in Malesia see Table 1.

America has two endemic sections, subg. *Pharmacosycea* sect. *Pharmacosycea* and subg. *Urostigma* sect. *Americana*, both with affinities to the Asian-Australasian sections of these subgenera, but not to the African *Ficus* flora. Subgenus *Urostigma* sect. *Galoglychia* is endemic to Africa (Madagascar, adjacent Indian Ocean islands, and the Arabian Peninsula). It is quite distinct from the Asian section, but shows affinities to sect. *Stilpnophyllum*, centred in Australia. Subgenus *Sycomorus* subsect. *Sycomorus*, is, in contrast to the majority of the subgenus, monoecious and subendemic to Africa (and Madagascar, adjacent Indian Ocean islands, and the Arabian Peninsula); *Ficus racemosa* is the only Asian species of this subsection and ranges from Sri Lanka and Pakistan to Australia. All other *Ficus* species of the African continent belong to groups centred in Asia, the species of more or less dry types of African vegetation are linked to groups represented in western Asia (subg. *Urostigma* subsect. *Urostigma*, subg. *Pharmacosycea* subsect. *Pedunculatae*, subg. *Sycidium* sect. *Sycidium*, and *F. heterophylla*/*montana*-groups). There are two species occurring both in Africa and Asia: *F. exasperata* Vahl and *F. palmata* Forssk.; *F. carica* extends to the Mediterranean. Like in other genera, the Madagascan species not belonging to (sub)endemic African groups tend to show affinities to Malesian groups.

Three centres are found in the periphery of the extensive Asian-Australasian region: New Caledonia with the *F. austrocaledonica*-group of subg. *Pharmacosycea*, Australia with subsect. *Malvanthera* of subg. *Urostigma*, the Sino-Himalayan subregion with subsect. *Frutescentiae* of subg. *Ficus* and subsect. *Plagiostigma* (and subsect. *Pogonotrophe*) of subg. *Synoecia*. Two major groups of species can be recognized in Malesia:

Table 1. Indigenous or naturalized (**F. hirta*) Malesian species. Uro = subg. *Urostigma*; Pha = subg. *Pharmacosycea*; Fic = subg. *Ficus*; Soe = subg. *Synoecia*; Syc = subg. *Sycidium*; Syo = subg. *Sycomorus*; ( ) = uncertain number.

	Uro	Pha	Fic	Soe	Syc	Syo	Total
Sumatra	32 (33)	5	13	14	16	14 (15)	94 (97)
Malay Peninsula	43	4	13	15	10	14	99
Java	28	5	7*	11	15	8 (9)	74 (75)
Borneo	38 (40)	4	20	25 (26)	26	25	138 (141)
Philippines	25	5	8	13	20	16	87
Celebes	18 (20)	7	9	6	22	16 (17)	78 (81)
Lesser Sunda Islands	12	4	1	3	8	6	34
Moluccas	14 (15)	4	5	7 (8)	16	23	79 (81)
New Guinea	18	14	2	24	29	51	139

a western Malesian group, dominated by species of the subgenera *Ficus*, *Synoecia*, and *Urostigma*, and with a clear centre in northern Borneo, and an eastern Malesian group, dominated by the subgenera *Pharmacosycea*, *Sycidium*, and *Sycomorus*, with a clear centre in eastern New Guinea. The two groups meet in the Philippines. The Sino-Himalayan region harbours some odd species or groups of species: *F. elastica* is clearly related to the Australian species of subsect. *Malvanthera*, *F. auriculata* and the closely related *F. hainanensis* Merr. & Chun are both related to the New Guinean species of subsect. *Neomorphe*. *Ficus henryi* Diels is probably related to the mainly New Guinean *F. conocephalifolia*-group of subg. *Sycidium*, and furthermore *F. griffithii* (Miq.) Miq. (subsect. *Sycocarpus*), *F. semicordata* and two allied species constituting sect. *Hemicardia* (subg. *Sycomorus*), and *F. laevis* of the monotypic subsect. *Pogonotrophe* (subg. *Synoecia*) without close relatives.

All groups comprise one or some species with very wide distribution, e.g. subg. *Ficus* with *F. hirta* and *F. lamponga*, subg. *Pharmacosycea* with *F. albipila* and *F. nervosa*, subg. *Sycidium* with *F. subulata* and *F. tinctoria*, subg. *Sycomorus* with *F. racemosa* and *F. variegata,* subg. *Synoecia* with *F. disticha* and *F. punctata*, and subg. *Urostigma* with *F. microcarpa* and *F. virens*.

Most species have more or less coherent ranges of distribution, a few are evidently disjunct in their distribution: *F. anastomosans* occurring on limestone in Thailand and Myanmar and in Celebes; *F. opposita* in New Guinea and Australia and in an islet in the Sunda Strait (between Java and Sumatra); and *F. subpisocarpa* ranging from S Japan to Taiwan and Cambodia and in Ceram (Moluccas). The general patterns of distribution and of diversification strongly suggest that the genus originated in eastern Gondwana with currently the two main centres in western Malesia (with northern Borneo as a hotspot) and the Sino-Himalayan region linked to it and eastern Malesia (with New Guinea as a hotspot) and the Pacific region linked to it. More or less isolated from centres are the Africa 'block' with the morphologically more or less distinct subdivisions sect. *Galoglychia* and subsect. *Sycomorus*, and the Australian 'block' with subsect. *Malvanthera*. The occurrence of two sections in the Neotropics is the more peculiar as they show clear morphological relations to Asian-Australasian groups.

AGE AND FOSSIL RECORDS

As suggested by Corner (1967) and confirmed by estimates based on molecular studies the origin of the genus dates back beyond 90 millions years ago when the mutual relation between *Ficus* and *Agaonidae* was probably established (Machado et al. 2001), thus before the break-up of Gondwana (Weiblen 2002). It is doubtful whether fossils ascribed to *Ficus* and periods before the Eocene really belong to the genus (Collinson 1989).

References: Collinson, M.E., The fossil history of Moraceae, Urticaceae (including Cecropiaceae), and Cannabaceae; in: P.R. Crane & S. Blackmore, Evolution, systematics, and fossil history of the Hamamelidae. 2 'Higher Hamamelidae' (1989) 319–339. — Corner, E.J.H., Ficus in the Solomon Islands and its bearing on the Post-Jurassic history of Melanesia. Philos. Trans., Ser. B, 253 (1967) 23–159. — Machado, C.A., E. Jousselin, F. Kjellberg, S.G. Compton & E.A. Herre, Phylogenetic relations, historical biography and character evolution of pollinating wasps. Proc. Roy. Soc. London, Ser. B, 268 (2001) 685–694. — Weiblen, G.D., How to be a fig wasp. Ann. Rev. Entomol. 47 (2002) 299–330.

INTRODUCED SPECIES

Relatively few species have been introduced in Malesia, all of them from other parts of Asia; the earliest introduction (in Java, Blume 1825) is probably that of *F. hirta* subsp. *hirta* from China. It might be possible that some 'popular' African species as *F. cyathistipula* Warb., *F. lyrata* Warb., and *F. natalensis* Hochst. have been introduced more recently and are not yet represented in herbaria. Many more Asian species of the area have been introduced elsewhere in the world, most frequently and abundantly common species like *F. altissima*, *F. benghalensis*, *F. benjamina*, *F. drupacea*, *F. elastica*, *F. microcarpa*, and *F. religiosa*, but also some rare species as *F. celebensis* (see also Condit 1969). In some places, as Florida, Manila, Rio de Janeiro and Sicily, the abundance of species like *F. microcarpa* and *F. religiosa* allowed pollinators (that arrived by plane?) to establish (Nadel et al. 1992; Ramirez 1994; De Figueiredo et al. 1995) and the *Ficus* species to naturalize. Introduction may also lead to unusual pollination and hybridisation of species of different sections and subgenera (Ramirez & Montero 1988; Ramirez 1994).

References: Blume, C., Bijdrage (1825). Leiden. — Condit, I.J., Ficus: the exotic species (1969). University of California. — De Figueiredo, R.F., J.C. Motta Jr. & L.A. da Silva Vasconcellos, Pollination, seed dispersal, seed germination and establishment of seedlings of Ficus microcarpa, Moraceae, in southeastern Brazil. Revista Bras. Biol. 55 (2) (1995): 233–239. — Nadel, H., J.H. Frank & R.J. Knight, Escapes and accomplices: the naturalization of exotic Ficus and their associated faunas in Florida. Florida Entomol. 75 (1992) 2938. — Ramirez B., W., Hybridization of Ficus religiosa with F. septica and F. aurea (Moraceae). Rev. Biol. Trop. 42 (1994) 339–342. — Ramirez B., W. & J. Montero S., Ficus microcarpa L., F. benjamina L. and other species introduced in the New World, their pollinators (Agaoidae) and other wasps. Rev. Biol. Trop. 36 (1988) 441–446.

ECOLOGY

The species of *Ficus* are mainly tropical. Comparatively few are subtropical and but two can be regarded as subtemperate, namely *F. carica* of southern Europe and Asia Minor, and *F. sarmentosa* Buch.-Ham. ex Sm. of Japan, Korea, and China. These two species may reach the latitude of 40° N in Europe and Japan but in general the limits of the genus lie between the latitudes of 35° N and S. In Asia *F. heteromorpha* Hemsl. occurs to c. 35° N as in China (Shensi and Honan) and in southern Korea *F. erecta*. In Australia *F. coronata* Colla occurs in Mallacoota in Victoria (37° 30' S). In Africa the genus ranges from Egypt (*F. sycomorus* L.) and Algeria (*F. cordata* Thunb. subsp. *salicifolia* (Vahl) C.C. Berg) to the Cape of Good Hope (*F. sur* Forssk.). In America from southern Florida (*F. aurea* Nutt. and *F. citrifolia* Mill.) and north-western Mexico (*F. petiolaris* Kunth) to Uruguay and northern Argentina (*F. luschnathiana* (Miq.) Miq.).

The megatherm nature of the genus is also reflected in its altitudinal distribution. Most of the tropical species occur in lowland and submontane zones below 1500 m. A small number occur in the montane zone between 1500 and 2400 m, but above this there are few records. Thus some Andean species have been collected at 3000 m (*F. andicola* Standl.) or even at 3200 m (*F. cuatrecasana* Dugand). *Ficus oleifolia* has been found at 3200 m on Mt Kinabalu (Borneo). In New Guinea, *F. endochaete*, *F. quercetorum*,

and *F. saccata* are montane species, typical of the *Nothofagus* forests up to 2400 m. Most species belong to vegetation subject to an ever-wet climate, but there are several which seem to be indifferent to the distribution of rainfall and can extend into the typical monsoon climate. Here they are not necessarily restricted to riversides and wells (the sumbers of East Java), but they are found also in places where soil dries out, such as teak forests. Among these are *F. albipila*, *F. punctata*, and *F. subcordata*, all of which thrive also in rainforest. A few species, however, seem characteristic of drier climates, such as *F. brachypoda* and *F. opposita*.

The role of *Ficus* in Malesian vegetation is important because almost every vegetation or biotype below the subalpine zone has one or more common species, important both to construction of vegetation and to food-supply of animals.

The genus is absent in mangroves, but some species, as *F. microcarpa*, can often be found in brackish swamp. Many species occur in fresh water swamps, in western Malesia, e.g. *F. callophylla*, *F. consociata*, *F. crassiramea*, and *F. sundaica*. In western Malesia, large terrestrial trees with the capacity to produce tall trunks are not common. Those found in this region are *F. variegata* of subg. *Sycomorus* and some species of subg. *Pharmacosycea*, *F. magnoliifolia* and *F. nervosa*. However, in New Guinea such trees, often buttressed and more than 30 m tall, make up a considerable proportion of the forest. They are species of subg. *Pharmacosycea*, subg. *Sycidium*, and subg. *Sycomorus* (sect. *Adenosperma* and subsect. *Neomorphe*). The smaller trees of these subgenera and subg. *Ficus* are mostly species of riversides and belong to the understories of the forest. Others are more characteristic of open places, particularly landslips, whence they come to abound in secondary vegetation at altitudes up to 1500 m. This secondary vegetation in Borneo, is characterized by a great abundance of flagelliflorous (geocarpic) species of sect. *Sycocarpus* (subg. *Sycomorus*), and of species of subsect. *Auratae* (subg. *Ficus*). Several secondary growth species, in particular those of subsect. *Eriosycea* (subg. *Ficus*), such as *F. fulva*, *F. grossularioides*, *F. hirta*, and *F. padana*, may behave as weed-trees and may form almost pure stands.

Hemi-epiphytic species often invade villages, orchards, and town-gardens, establishing themselves on trees and walls (Fig. 1). They can also often be found on limestone hills, rocky cliffs, and rocky headlands by the sea.

The root-climbers of subg. *Synoecia*, seem mostly to require a shade-phase to establish themselves. They do not participate in the initial tangle of climbers which so often develop in early stages of secondary forest.

Several species are rheophytic and can thus be found in and along swift rocky streams (see p. 27). *Ficus* is scarce on very sterile soil, such as the leached sands of padang and kerangas, probably because of the need of an ample nutrient supply to ensure by flower-production the maintenance of the pollination system. Species adapted to nutrient-poor conditions are *F. deltoidea* and *F. oleifolia*, which both can be holo-epiphytic and are distinct by the phenology of the fig production. *Ficus* can play an important role in colonisation of volcano islands, as demonstrated for the Krakatau Islands between Java and Sumatra and Long Island near Papua New Guinea (Thornton et al. 1996; Shanahan et al. 2001).

Fig. 1. A hemi-epiphytic fig species on an abandoned altar in Bali. Photo L. van der Pijl.

References: Shanahan, M., R.D. Harrison, R. Yamuna, W. Boen & I.W.B. Thornton, Colonization of an island volcano, Long Island, Papua New Guinea, and an emergent island, Momot, in its caldera lake. V. Colonization by figs (Ficus spp.), their dispersers and pollinators. J. Biogeogr. 28 (2001) 1365–1377. — Thornton, I.W.B., S.G. Compton & C.N. Wilson, The role of animals in the colonization of Krakatau Islands by fig trees (Ficus species). J. Biogeogr. 23 (1996) 577–592.

WOOD ANATOMY

(P. Baas)

Wood anatomy — The wood anatomy of miscellaneous *Ficus* species has been described and pictured in many publications (of which only few, mainly from Malesia, are cited below, but see Gregory 1994 for a full bibliography). Koek-Noorman et al. (1984) studied 25 species of *Ficus* from throughout its geographical range. Vu-Cong Quy (Sosef et al. 1998: 614) summarized the wood anatomy of 5 Malesian species in IAWA numerical codes. Throughout its range the wood anatomy of *Ficus* is quite uniform as summarized below.

Growth ring boundaries are absent or faint. *Heartwood* is not differentiated in colour from the sapwood. The *texture* of the wood is medium to coarse due to the broad parenchyma bands and wide vessels. *Vessels* are diffuse, of low density (2–12 per mm^2), solitary and in short radial multiples. Perforations are simple; intervessel pits are alternate and 6–12 μm in diameter; vessel-ray and vessel-axial parenchyma pits are coarse and often have reduced borders. Thin-walled tyloses are occasionally present. The *fibres* have simple to minutely bordered pits confined to the radial walls and are almost always non-septate and fairly thin-walled. *Axial parenchyma* is abundant and typically in broad bands (3–15 cells wide) that are partly associated (paratracheal),

partly independent (apotracheal) from the vessels. Vessels outside the parenchyma bands have narrow vasicentric parenchyma sheaths. The *rays* are heterocellular and of two sizes: low uniseriates and tall multi(2–9)-seriates which occasionally have sheath cells. Prismatic *crystals* are of variable occurrence in the marginal ray cells and axial parenchyma. Radial *latex tubes* are present in most species, but are commonly only few and far between tangential sections; their diameter (in TLS) ranges from equal to that of the ray cells to almost as wide as the multiseriate rays. The wood anatomical character combinations of *Ficus* (very broad parenchyma bands, nonseptate fibres, crystal distribution and few and wide vessels) support its fairly isolated position in the Moraceae according to Koek-Noorman et al. (1984).

Latex-tubes — Septate latex-tubes permeate the tissues of all parts of the plant, but they may be absent from sclerenchymatous bundles and from clusters of sclerotic cells in the cortex. The tubes branch but do not anastomose; they are not pitted, and rarely have much thickened or lignified walls. They are widest in the pith and narrower towards the cortex. The direction is mainly longitudinal, or along the veins in the leaves, but just below a node transverse and oblique branches from the latex-tubes in the pith and cortex enter the petiole, stipules, and axillary bud. Also, at intervals along the stem in some species, a latex-tube in the pith may curve out, or send a branch, transversely in a xylem-ray to the phloem where it turns apically and grows longitudinally with or without one or two longitudinal branches: a few branches may also curve down and end blindly. It seems that the latex-tubes in the rays of the secondary xylem and phloem extend by intercalary growth in such a way that they pull upon the walls of the ray parenchyma cells abutting on them, causing these walls to be directed inwards (centripetally) in the xylem and outwards (centrifugally) in the phloem. In the leaf there are two states, but it is doubtful if they have systematic value. Either latex-tubes follow the main veins with few excursions into the mesophyll, if any at all, or they follow the minor veins as well with copious extensions into the mesophyll. In all cases the tubes terminate blindly with simple ends.

Vreede (1949) has given a general account of the structure of the latex system in *Ficus*. For the chemistry of latex, particularly the occurrence of waxes, see Ultée (1922). Most species have white milky sap (latex). It is clear yellow in *F. lanata*, *F. magnoliifolia*, and *F. sagittata*, and pale yellow to buff in others as *F. fistulosa*, *F. lepicarpa*, and *F. septica*. In *F. trachypison* it turns yellow on exposure. In a few the milky sap is scant or serous.

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LEAF ANATOMY

Introduction — The importance of microscopic structure of the leaf in the classification of *Ficus* was first shown by Renner (1907) and emphasized again by Grambast (1954). Subgenera, series, and even subseries may be distinguished but rarely do the differences extend to the specific level. Nevertheless, as the same leaf-form often occurs in different series, the microscopic structure can be a check, if not a guide, to the identification of sterile material. The diversity is, in fact, so great that *Ficus* should be a warning against use of such microscopic characters for generic distinction. Thus, subsect. *Eriosycea* (subg. *Ficus*) lacks cystoliths which are otherwise distinctive of the genus. Some species of subg. *Sycidium* sect. *Palaeomorphe* are distinct by tissue of the leaf between the epidermal layers permeated with fibres excurrent from the bundle-sheaths, much as in the Sapindaceae genus *Billia* Peyr (Hardin 1957). True idioblasts occur in some American species of subg. *Urostigma* but not in the Asian or Australasian. The thin, featureless lamina of *F. chartacea* would hardly be deemed congeneric with the thick lamina of *F. xylophylla* with lignified hypodermis and sunken stomata. Also, the xeromorphic lamina of species of sect. *Kissosycea* with stomata aggregated in pits and the papillate epidermis of *F. macilenta* might be considered fundamentally different from the gyrose plicae of the cuticle in *F. annulata*, yet both are closely allied with species devoid of these peculiarities.

Technique — With practice, the microscopic examination of the lamina, living or dried, is simple and rapid. A razor-tip maybe used, but a better instrument is a fine scalpel with short oblique edge, 2–3 mm long, of razor-sharpness, like an oblique chisel: shavings of the upper and lower sides of the lamina should be pushed off under the binocular dissecting microscope. The tip of the instrument should be dipped in dilute potash (5%) before applying to the lamina, and the shavings should be mounted in the same: it clears the tissue and enables one to focus into the mesophyll in the thicker parts, and such shavings can be removed from the potash and mounted permanently into polyvinyl alcohol (Metcalfe & Richardson 1949). Transverse sections are rarely needed for identification. All parts of the lamina have the same construction, except the very edge, and it is usually convenient to take shavings near the midrib. Good herbarium material, regardless of age, will show the structure clearly, but bad material, with decayed mesophyll, may be impossible to manipulate and will show, at best, merely epidermal features.

Cuticle — In several groups (listed on pp. 20, 21), the cuticle is more or less striate, particularly around stomata and cystoliths. In a few species of subg. *Urostigma* the striations are magnified into prominent gyrations on the underside of the lamina, so as almost to conceal the stomata. This feature may indicate affinity, but *F. depressa* is so close to *F. annulata* that the absence of gyrations in *F. depressa* may be the only means for distinguishing sterile material (Fig. 2).

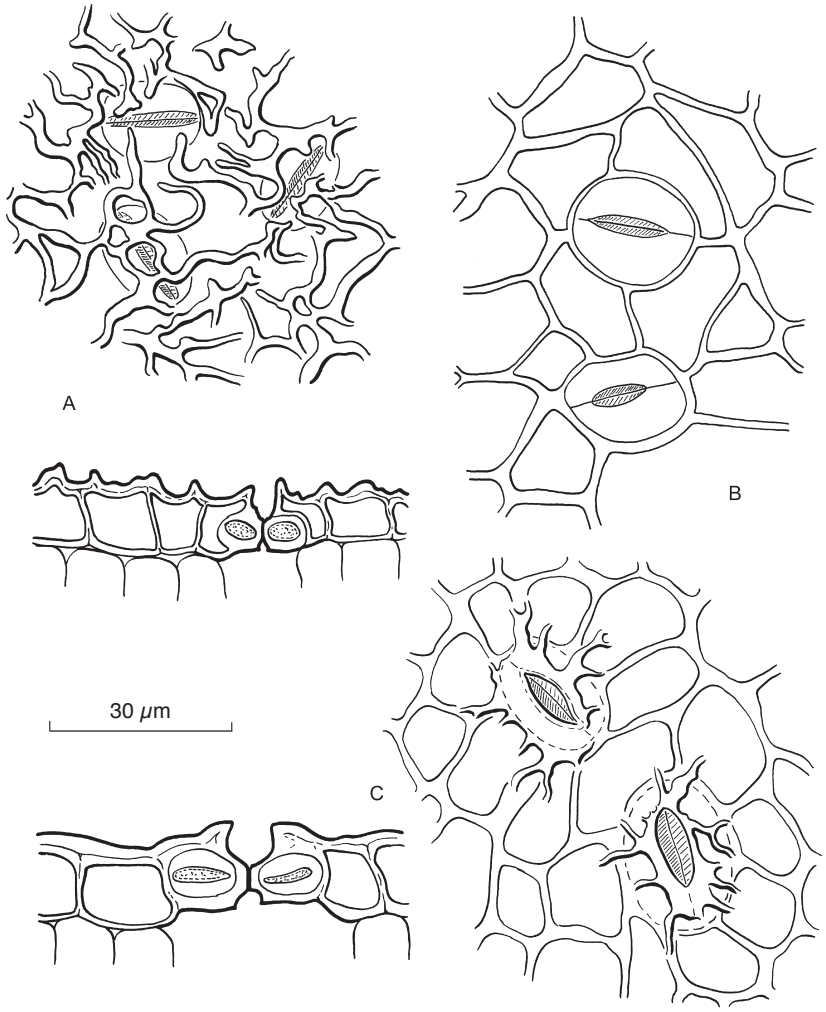

Fig. 2. Cuticle of A. *F. annulata*, with strong ridges obscuring the stomata; B. *F. depressa*, smooth; C. *F. globosa*, with ridges round the stomata.

Epidermis — The cells are usually polygonal, and are always so when there is a hypodermis, but in some species those of the lower epidermis may have the undulate outline typical of the dicotyledons. Some species show both states in different collections, and the differences may be a matter of circumstances, shade and humidity favouring the sinuous outline (Watson 1942). The more numerous the layers of the hypodermis, the smaller the epidermal cells. In sect. *Kissosycea* a small rectangular crystal generally occurs in each epidermal cell. In several species of different groups there may be a striking sphaerocrystal, or spherical aggregate of crystals, in some epidermal cells on one of the sides of the lamina, e.g. in subg. *Ficus* sect. *Ficus*, subg. *Sycidium* sect.

Palaeomorphe (p.p., excl. *F. obscura* and related species with sclereid-like fibres in the lamina, see below), subg. *Urostigma* sect. *Stilpnophyllum*, and in some species of subg. *Pharmacosycea*. Except, however, in sect. *Sycidium*, the systematic value of these crystals is uncertain. In hard laminas, the epidermal cells may be silicified, as in sect. *Kissosycea*, sect. *Sycidium*, and sect. *Adenosperma*. In a few species the lower epidermal cells project papillae, generally with striate cuticle, and the lower epidermis appears minutely pruinose under a hand-lens (see list on pp. 20, 21).

Hypodermis — This feature, though it may be strikingly developed, is not of great systematic value. If the hypodermis is several layers thick (2–4), the cells diminish in size from the innermost layer towards the surface. The coriaceous lamina of subg. *Urostigma* has usually a well-developed hypodermis on both sides, though thicker on the upper side, but subsect. *Urostigma* (apart from *F. hookeriana* Corner and *F. orthoneura* H. Lév. & Vaniot) has no hypodermis. The layer is generally absent from sect. *Sycocarpus* and is characteristically absent from sect. *Palaeomorphe* (p.p., excl. *F. obscura* and related species with sclereid-like fibres in the lamina, see below); indeed the absence of hypodermis is one of the microscopic means of distinguishing *F. subulata* and *F. virgata*.

Palisade-tissue — In thick laminas there may be 2–4 rows of palisade-cells. Also, some species have long, and others short palisade-cells. These details may be environmental effects. The coriaceous laminas of subg. *Urostigma*, held obliquely to the light, may have a row of short palisade-cells on the lower side.

Mesophyll — Variations in thickness of the lamina, particularly among allied species, are generally caused by varying thickness of the mesophyll, which either has more cells in the thick laminas or the cells have longer arms. This is the cause, for instance, of the thick lamina of *F. xylophylla*.

Vascular bundle sheath — This feature can be determined only in transverse sections, but there are three points which have systematic value: in some species the sheath of fibres around the bundle is U-shaped and open to the upper side. In others as *F. religiosa* and allied species (subsect. *Urostigma*), subg. *Pharmacosycea* (except *F. albipila* and the Madagascan *F. assimilis* Baker), sect. *Rhizocaldus* (except *F. laevis*), and sect. *Palaeomorphe* p.p., the sheath is closed. Then thirdly the vascular bundle, regardless of the nature of the sheath, may be trabeculate, that is connected to the upper epidermis by collenchyma, as it always is on the lower epidermis. It is the trabeculate condition which causes the venation to be finely raised on the upper side of the dried lamina. These differences refer to the ultimate reticulations or, at least, to the veins smaller than the intercostals, for the larger veins are generally trabeculate. Concerning details of vein-length and vein-endings from the physiological point of view see Philpott (1953).

Mesophyll-fibres — In *F. obscura* and allied species (see subsect. *Palaeomorphe*), the fibres of the vascular bundle sheath grow out into the mesophyll and palisade tissues and pervade them like slender snakes. They are sclereid-like and mostly simple, but occasionally branched. They are not isolated idioblasts. Any small bit of lamina, cleared in potash, will at once show if they are present.

Stomata — Except for the water-stomata in the hydathodes on the upper side of the lamina, the stomata are limited to the lower side. Developmentally they belong to the anomocytic ranunculaceous kind (Grambast 1954); that is, the mother-cell is formed by unequal division of an epidermal cell and comes to be surrounded by 3–7 epidermal cells without special accessory cells. In size the stomata may vary much, evidently according to environmental conditions, and variations in the same lamina are in part,

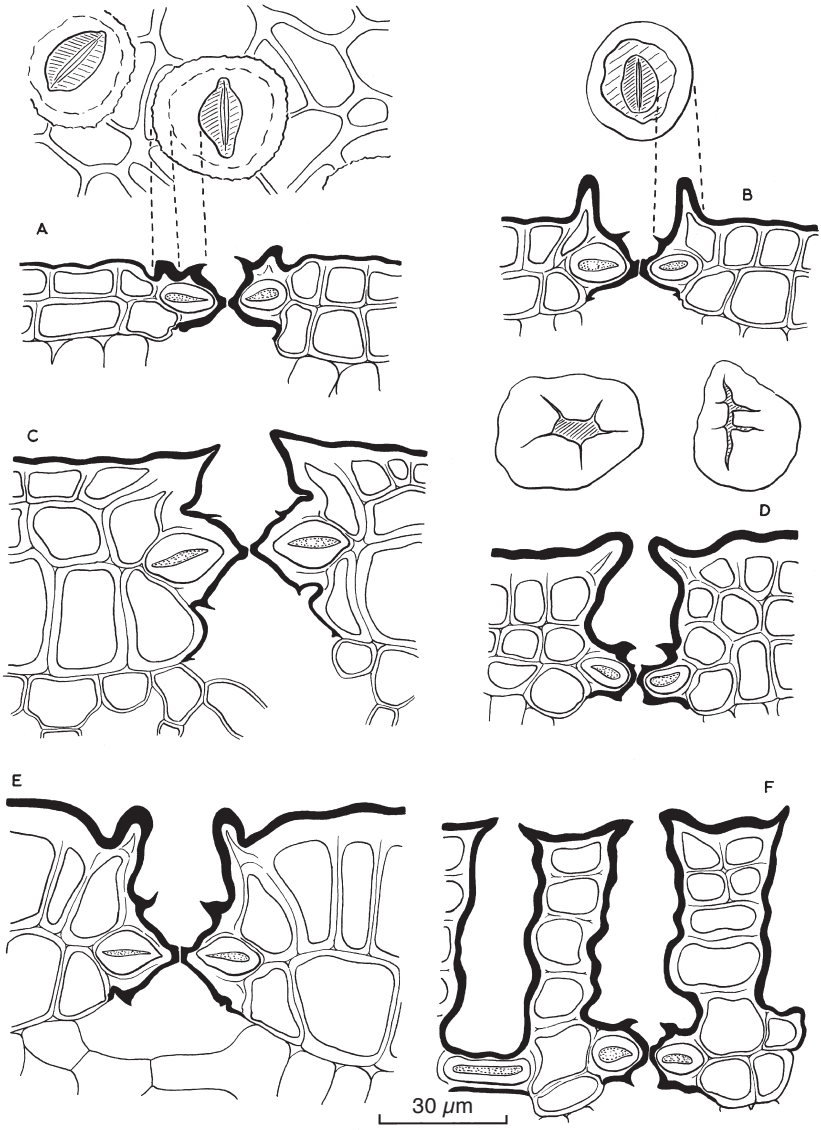

Fig. 3. Stomata of subg. *Urostigma*, more or less deeply sunken according to the development of the hypodermis. A. *F. subgelderi*; B. *F. consociata*; C. *F. sundaica*; D. *F. rhizophoriphylla*; E. *F. microsyce*; F. *F. glandifera*.

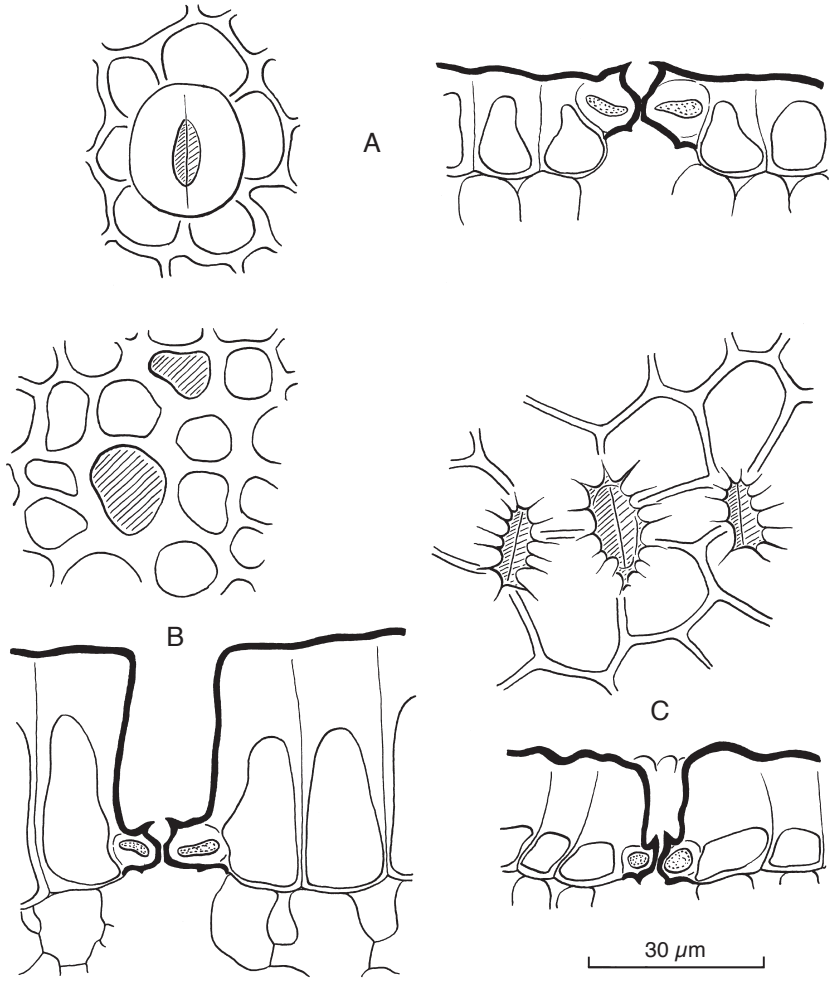

Fig. 4. Stomata of subg. *Sycidium*, sunken by the development of the epidermis. A. *F. tinctoria* subsp. *gibbosa*, superficial; B. *F. tinctoria* subsp. *gibbosa*, sunken; C. *F. leptodictya*, with grooves round the stomatal opening.

at least, caused by differences in time of development, for the earliest stomata, along the veins, are larger. In subg. *Urostigma*, the stomata are mostly sunken in connection with the development of the lower hypodermis, and an annular ridge of cuticle often forms an outer chamber (Fig. 3). In other subgenera the sinking of the stoma is caused by elongation of epidermal cells, without hypodermis, so that the stomata lies at the bottom of a cylindrical pit (Fig. 4). In some climbers (subg. *Synoecia*) the stomata are superficial but clustered and the cluster is sunk in a pit (foveola) so that the areolae appear minutely foveolate (Fig. 5). The same occurs in a few hemi-epiphytic species with sunken stomata. The condition is not to be confused with that in *F. pumila* where thick bulging veins hide the areolae.

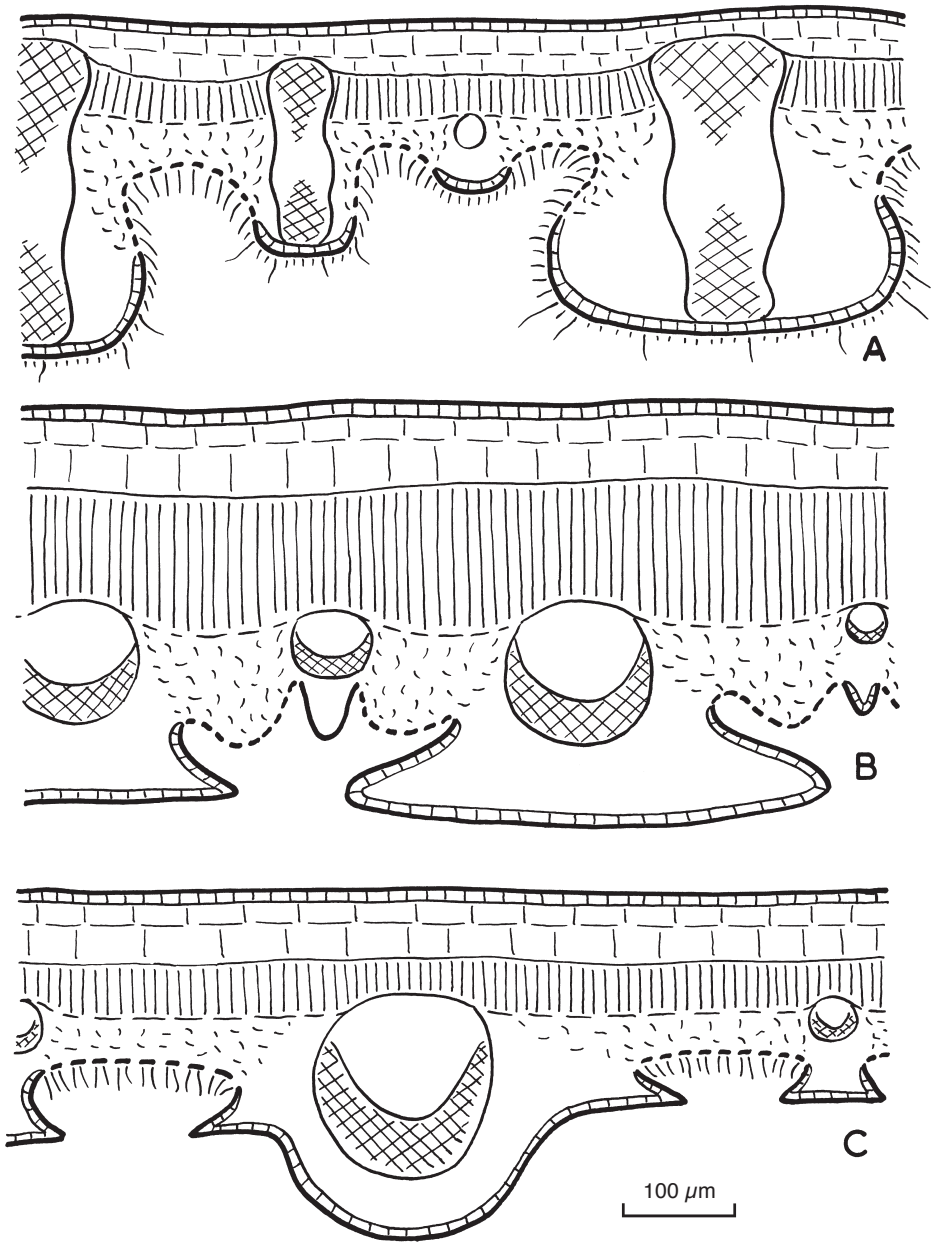

Fig. 5. Structure of foveolate laminas in subg. *Synoecia*, with stomatal pits, showing epidermis, hypodermis, mesophyll, vascular bundles, and their fibrous sheaths. A. *F. pumila*; B. *F. excavata*; C. *F. supperforata*.

Crystals — In addition to those mentioned for the epidermis, sphaerocrystals often occur in the mesophyll or palisade, but they seem rarely to be diagnostic. Rectangular crystals in the cells of the bundle-sheaths distinguish subsect. *Urostigma* among Asian and Australasian species of subg. *Urostigma*, but the characters seem not to hold for the African and American species.

Gland-hairs — These submicroscopic structures (which seem not to have glandular functions) are to be found on young parts and they are often caducous from the adult. In a few species, as *F. disticha*, *F. pantoniana*, and *F. sagittata* (all of subg. *Synoecia*),

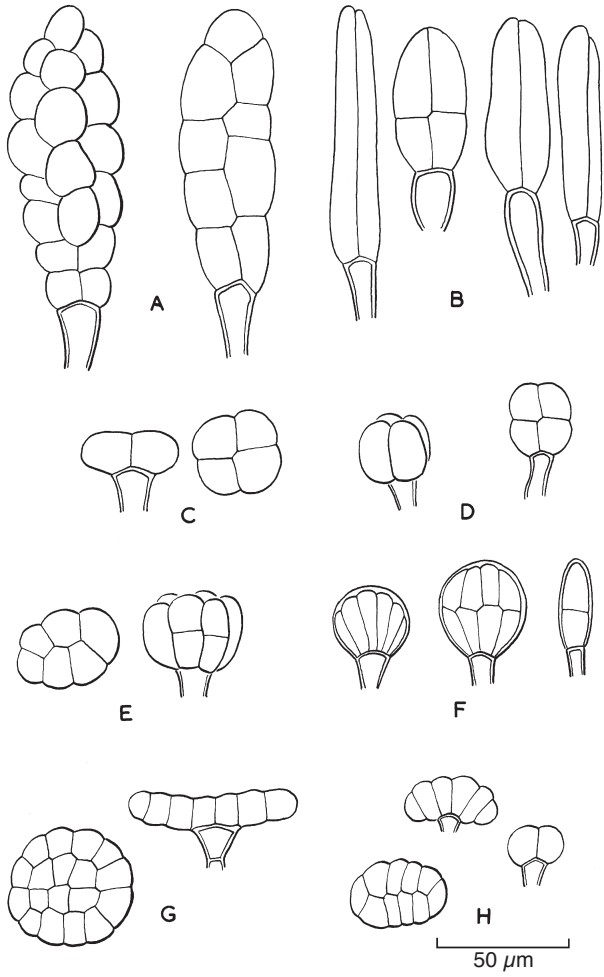

Fig. 6. Pluri- to multicellular trichomes (gland-hairs). A. Multicellular and elongate, *F. langkokensis*; B. pluricellular and cylindrical to ellipsoid-capitate, subg. *Urostigma*; C. pluricellular, cruciate, and discoid-capitate, *F. melinocarpa*; D. pluricellular, cruciate, and globose-capitate, sect. *Sycidium*; E. multicellular and globose-capitate, *F. trachypison*; F. pluricellular, flabellate, and globose-capitate, *F. variolosa* Benth. (from China); G. pluricellular and peltate, *F. punctata*; H. pluricellular and subpeltate, *F. sagittata*.

they are large and abundant enough to form a fine reddish scurf or powder. Their shape and cell-number are systematic, but their investigation incomplete, and the following classification is given with reservation. In all cases they arise from single epidermal cells which, as the stalk-cells, may become embedded in the hypodermis, and their characters lies in the head borne on the stalk. The brown scurf on young parts of *F. globosa*, the Australian *F. rubiginosa* Vent. and *F. macrophylla* Pers., and a few other species of subg. *Urostigma* is caused by dense moniliform multicellular trichomes. There are four kinds of capitate multicellular and pluricellular trichomes (gland-hairs):

1) Elongate, cylindrical to sublimate, 1- or 2-celled, or to ellipsoid with 4 cells (Fig. 6b): subg. *Urostigma*.
2) Capitate, subglobose or ellipsoid, 2-celled or divided into 4 cells either cruciately (Fig. 6c) or transversely (Fig. 6d), often with transitions to larger subglobose heads with 5–16 cells (Fig. 6e): subg. *Pharmacosycea*, and all dioecious subgenera, except groups mentioned under 3) and 4).
3) Flabellate, divided into 3–8 cells radiating from the stalk in one longitudinal plane (Fig. 6f): subg. *Ficus* subsect. *Frutescentiae*, *F. disticha* and allied species (sect. *Kissosycea*), subg. *Sycidium*, *F. conocephalifolia*-group p.p., and *F. goniophylla*.
4) Peltate or subpeltate, many-celled in a plane more or less at right angles to the stalk (Fig. 6g, h): subg. *Synoecia*, several groups, but not subsect. *Plagiostigma* (with capitate gland-hairs).

Cystoliths — Strictly, this is the name for the pedestal and internal secretion produced by it in the special enlarged epidermal cells which have been called lithocysts (Renner 1910). The distinction is necessary because lithocysts may be recognized with no cystoliths, and cystoliths may form in hair-bases or ordinary epidermal cells. However, custom has been followed in the descriptions, and the familiar word cystoliths has been used to imply lithocysts. Except for subg. *Urostigma*, the lithocyst is generally a cell with a short spike to the interior, as if an abortive hair. This spike may, in fact, be enlarged into a hair with, or more often without, a cystolith. Thus it is generally concluded that lithocysts are modified hairs. A few species, indeed, have only hairs, as *F. erecta* and *F. opposita*, while their close allies have normal lithocysts with cystoliths as well as hairs. In subg. *Urostigma* the lithocysts are most highly developed and never spike-like; commonly they are deeply immersed by the hypodermis in the palisade or mesophyll, but they arise from epidermal cells in the young leaf (Fig. 7; Pundir 1977). In all cases, small epidermal cells (pericentral cells) radiate from the lithocyst and give it a rosette-like appearance in surface-view. In subg. *Urostigma* there are usually 5–8 pericentral cells, in other subgenera 8–20 (even up to 50 in large lithocysts of subg. *Sycidium*); in lithocysts transitional to hairs it can be seen that these pericentral cells are homologous with those making the base of the pustulate or muriculate hair. Most detailed work on cystoliths has been done on *F. elastica*, grown in greenhouses (Fig. 8). The cystolith develops as a stalk growing into the cell from the outer wall. It secretes the head at the top of the stalk and both lie external to the cytoplasm of the cell, which is thus invaginated and separated from the cystolith by a membrane. The lithocyst remains alive throughout the life of the leaf (Ajello 1941). The pedestal is composed of cellulose and crystalline silica (Eschrich 1954). The head consists of uneven concentric layers of cellulose

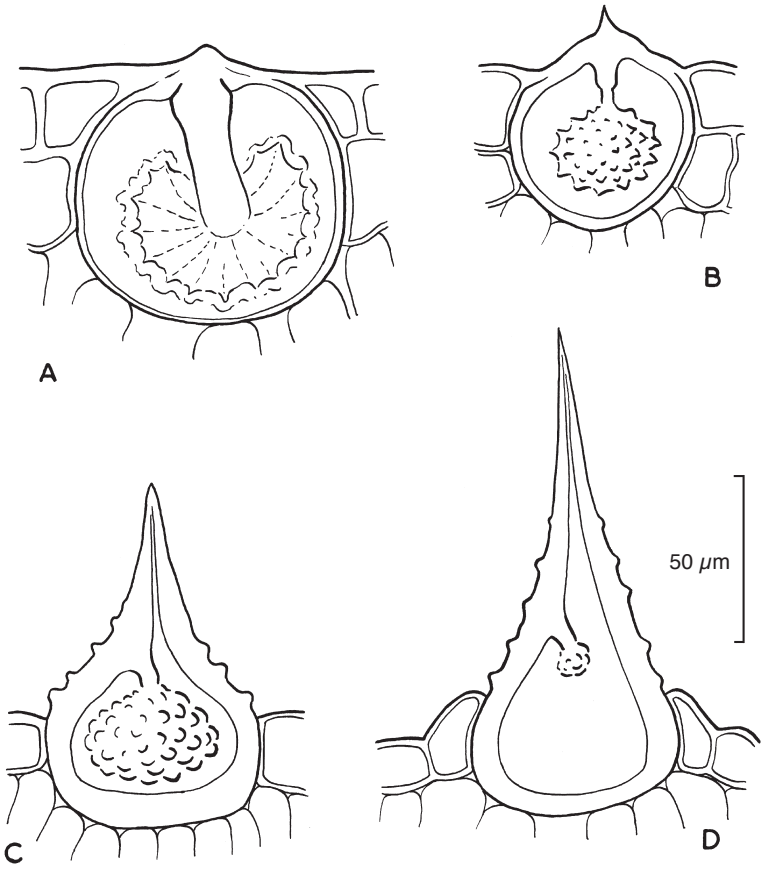

Fig. 7. Cystoliths. A. *F. microdictya*, with stout peg; B. *F. vasculosa*, spicate; C. *F. ampelas*, papillate; D. *F. trachypison*, transitional to hair.

impregnated with calcium carbonate and, to a much less extent, with silicate. The head becomes variously lobed and botryoidal, and is crossed by fine radiating strands, also of cellulose, from the top of the pedestal (Zimmermann 1891). In *F. elastica*, according to Hiltz (1950), the calcium carbonate is in the form of calcite, rendered stable in aqueous solution by the presence of silicate, as a silico-carbonate. Experiment indicates that the cystoliths indeed secrete lime and that this is connected with illumination, the cystolith being little developed in darkness (Stahl 1920; Freisleben 1933). There are various differences in the shape of the head which may be specific, but in view of the environmental effects the subject needs careful investigation. In *F. microdictya* (New Guinea) and *F. theophrastoides* Seem. (Solomon Islands and Fiji) the cystolith may consist mainly of an extremely stout pedestal, like an inwardly directed dagger (Fig. 7). It is characteristic of subg. *Sycidium* sect. *Sycidium* that the lithocysts are papillate with microscopic warts like the hairs (Fig. 7). Cystoliths are usually visible as minute pustules or points in dried laminas, sometimes even with a hand-lens.

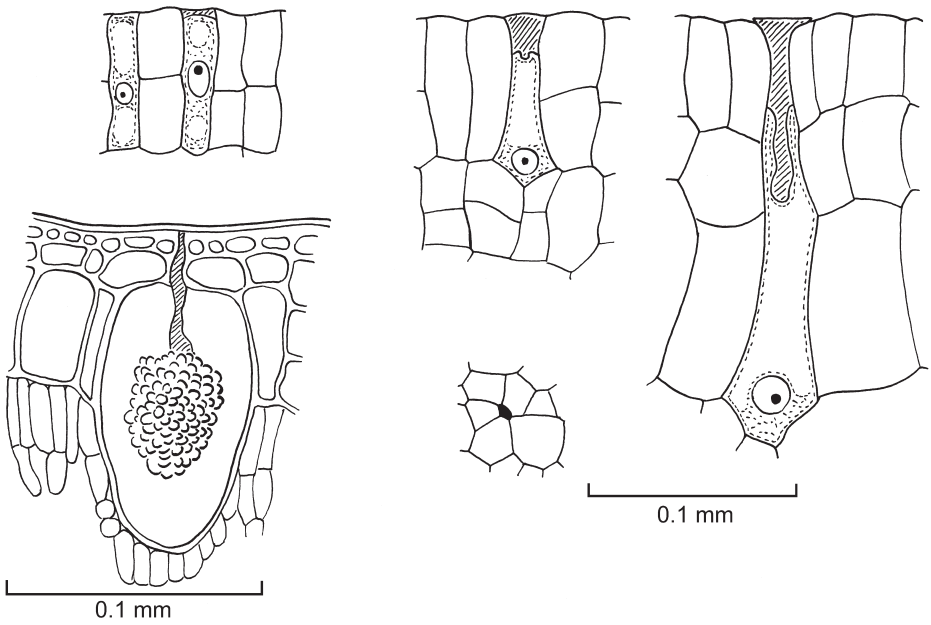

Fig. 8. Development of cystolith of *F. elastica* (after Ajello 1941).

The following list is a useful summary of the diagnostic occurrence of cystoliths in the laminas in Asian and Australasian species.

1) Cystoliths none — subg. *Urostigma* subsect. *Conosycea* (some species) and subsect. *Malvanthera* (some species); subg. *Ficus* subg. *Eriosycea* for the greater part; subg. *Synoecia* subsect. *Trichocarpeae* (*F. trichocarpa*).
2) Cystoliths only on the upper side of the lamina — subg. *Urostigma* subsect. *Urostigma* (*F. amplissima* and *F. rumphii*), subsect. *Conosycea* (some species) and subsect. *Malvanthera* (some species); subg. *Synoecia* subsect. *Pundulifoliae* (*F. araneosa*).
3) Cystoliths on both sides of the lamina — subg. *Urostigma* subsect. *Conosycea* for the greater part and sect. *Stilpnophyllum* for the greater part; subg. *Pharmacosycea* sect. *Oreosycea* (*F. albipila*-group p.p. and *F. austrocaledonica*-group p.p.); subg. *Synoecia* sect. *Kissosycea* (p.maj.p.) and sect. *Rhizocladus* (p.p.); subg. *Sycidium* sect. *Sycidium* (p.p.) and sect. *Palaeomorphe* (*F. tinctoria*-group and *F. subulata*-group p.p.); subg. *Sycomorus* sect. *Adenosperma* (p.p.), sect. *Dammaropsis* (p.p.), and sect. *Sycocarpus* (p.p.).
4) Cystoliths only on the lower side of the lamina — subg. *Urostigma* subsect. *Urostigma* (p.maj.p.); subg. *Pharmacosycea* sect. *Oreosycea* (p.maj.p.); subg. *Ficus* sect. *Ficus* and subsect. *Eriosycea* (the Sino-Himalayan *F. langkokensis* Drake and *F. tuphapensis* Drake); subg. *Synoecia* sect. *Kissosycea* (p.p.) and sect. *Rhizocladus* (p.p.); subg. *Sycidium* sect. *Sycidium* (p.p.) and sect. *Palaeomorphe* (p.maj.p.); subg. *Sycomorus* sect. *Sycomorus*, sect. *Hemicardia*, sect. *Adenosperma* (p.p.), sect. *Dammaropsis* (p.p.), sect. *Papuasycea*, sect. *Bosscheria*, and sect. *Sycocarpus* (p.p.).

Hydathodes — On living leaves of most species there occur small white, yellow or orange spots on the upper side of the lamina between the midrib and the margin. They are hydathodes, around which a thin film of dried excretion can generally be seen. They have a simple epidermis on which are crowded motionless stomata (water-stomata). Internally, parenchymatous cells lead without intervention of palisade tissue to a plexus of tracheids in the areolae containing the hydathode. No systematic value is yet attributable to the hydathodes. The yellow or orange colour of many is evidently due to caroteen (Molisch 1916). In *F. elastica* it is said that they occur only on sapling leaves (Kamerling 1913).

Waxy glands (or waxy glandular spots) — These are rounded epidermal patches, 2–4 mm width, on the underside of the lamina or on the twig on the node (see p. 34). Living, they may be paler or darker than the surrounding tissue, and when dried, they vary from yellowish to dark brown or blackish. They consist mainly of modified epidermis, the cells being narrower, higher, thinner-walled, and more crowded, even in 2 or 3 rows, and they have denser contents than normal. They do not contain starch or reducing sugars, but secrete a thin layer of wax. Hence, they are not extra-floral nectaries but wax-glands (Renner 1906; Zimmermann 1932). Small ants may habitually visit the glands and eat the wax (*F. deltoidea*, *F. hirta*, *F. montana*, and *F. septica*, according to Renner 1935).

Small parrots (*Loricus pusillus* G.R. Gray) have been seen feeding on waxy glands of *F. glaberrima* in Java and the glands are found to contribute substantially to the nutrition of the animals. They nip off the thin waxy epidermis which they are able to digest, and over the scar a new, but non-secretory epidermis is developed from the underlying collenchyma without detriment to the leaf (Heide 1928).

Survey of special microscopic features of the lamina

1) Stomata sunken: subg. *Urostigma*; subg. *Synoecia*; subg. *Sycidium* (*F. ampelas* p.p., *F. coronulata* Miq. from Australia, *F. tinctoria*, and *F. tonsa*); subg. *Sycomorus* sect. *Adenosperma* (*F. verticillaris* Corner p.p. from the Solomon Islands and *F. umbonata*).
2) Hairs microscopically twinned, long, brown: subg. *Urostigma* (*F. bracteata* and *F. consociata*).
3) Hairs septate: subg. *Synoecia*.
4) Hairs coarsely papillate: subg. *Sycidium* sect. *Sycidium* (*F. conocephalifolia*-group, *F. gryllus* Corner from the Solomon Islands, *F. riedelii*, and *F. tsiangii* from China); subg. *Sycomorus* sect. *Bosscheria* and sect. *Hemicardia*.
5) Lower epidermal cells bulging as papillae, often with striate cuticle: subg. *Urostigma* (*F. lowii*); subg. *Ficus* (*F. macilenta*); subg. *Synoecia* sect. *Rhizocladus* subsect. *Plagiostigma*.
6) Cuticle of lower epidermis gyroso-plicate, at least round the stomata, the epidermal cells not papillae-form: subg. *Urostigma* (*F. annulata*, *F. globosa*, and some species from India and the Sino-Himalayan region, *F. arnottiana* (Miq.) Miq. var. *subcostata* Corner, *F. costata* Aiton, *F. hookeriana* Corner, and *F. orthoneura* H. Lév. & Vaniot).

7) Cuticle more or less striate: subg. *Ficus*; subg. *Synoecia* sect. *Rhizocladus* subsect. *Plagiostigma*; subg. *Sycidium* sect. *Sycidium*; subg. *Sycomorus* sect. *Adenosperma*.
8) Cystolith characters: see p. 19.

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MORPHOLOGY

The genus is so diverse in many respects that it is comparable with a large family.

Major differentiating characters (the morphological characters that distinguish *Ficus* from (most) other genera of Moraceae) are:

1) The flowers remain entirely enclosed in an urceolate receptacle (syconium) also during anthesis.
2) Heterostyly (imperfect or perfect): the stigmas lined up (in monoecious taxa due to differences in length of the pedicel (or also shape of the ovary)).
3) Pedicels of pistillate flowers are distinctly different in length in the same inflorescence.
4) The number of staminate flowers (per inflorescence or per plant) is small in relation to the number of pistillate flowers.
5) Membranous tepals of the pistillate flowers (also present in *Broussonetia*).
6) Formation of a continuous, often coherent layer of stigmata (synstigma).
7) Waxy glandular spots on the lamina beneath and/or on the nodes of leafy twigs.

Other differentiating characters:

8) Pronounced protogyny: the staminate flowers are at anthesis when in the same inflorescence the seeds are (nearly) ripe.
9) The perianth (and interfloral bracts + internal bristles) remains intact in spite of loss of their protective function.

Several of the generic features of the flowers and inflorescences are essential for the pollination system. They may be regarded as pre-adaptations to protection against damage by insect larvae rather than as adaptations to pollination. Also the watery to gelatinous liquid in the syconia (figs) of many species of subg. *Sycomorus* probably has (had) a protective function, and possibly even delayed male anthesis. Anthesis of pistillate flowers ahead of staminate ones in a bisexual inflorescence is not unusual in Moraceae, as in simple cymose inflorescences the pistillate flowers are formed on the proximal axes and the staminate ones on distal axes. The interval between female and male anthesis is normally some days and the interval of some weeks in *Ficus* is peculiar. Coincidence of anthesis of staminate and pistillate flowers in a not (yet) fully closed receptacle would have given opportunities to penetrate among flowers.

Habit — The genus shows a wide range of life- and growth-forms.

Terrestrial shrubs and trees — Most forest-forms occur in the genus except for the herbaceous one. The nearest approach is the suffrutescent habit seen in the ground-covering subshrub *F. griffithii* (Miq.) Miq. (from Myanmar and Thailand) and *F. suffruticosa* (from New Guinea), members of subg. *Sycomorus*. Small shrubs, as *F. heterophylla*, *F. montana*, and *F. repens* Roxb. ex Willd. of sect. *Sycidium* and several species of subsect. *Frutescentiae* link the suffrutescent species to truly woody shrubs of more than 1 m tall as can be found in most subgenera.

Their allies are small trees with a tendency to flower precociously, even at a height of 50 cm. Between them and lofty trees reaching the forest-canopy there are, again, all intermediates. The tallest trees occur in subg. *Pharmacosycea*, as *F. albipila* and *F. magnoliifolia*, which reach 35 m in height, and *F. polyantha*, up to 45 m high. Trees of such dimensions also occur in subg. *Sycomorus* (sect. *Adenosperma* and sect. *Sycomorus*). These subgenera also comprises some species of similar stature in America and Africa.

Pachycladous (or in Corner's terminology pachycaul) trees with stout twigs, large leaves, and sparse branching are few: some species of subg. *Sycomorus*, as *F. pseudopalma* (Philippines), *F. dammaropsis* (New Guinea), *F. saccata* (New Guinea), *F. theophrastoides* (Solomon Islands and Fiji), and some New Caledonia species of subg. *Pharmacosycea*.

Between these and the leptocladous (leptocaul) trees with slender twigs, small leaves, and profuse branching, there are many intermediates in all degrees of transition, many of which show the sympodial *Terminalia*-habit of branching, implying that the first internode(s) of lateral branches are very short, the next one very long, and the subsequent ones becoming gradually shorter, therefore the leaves become more or less clear tufted at the end of the branches from where also the next branches develop; the proximal nodes usually do not bear normal leaves, only stipules. This way of branching

is found in most subgenera, more or less prominently so in subsect. *Frutescentiae* of subg. *Ficus*, sect. *Adenosperma* of subg. *Sycomorus*, and subsect. *Glandulosae* of subg. *Pharmacosycea*. It is absent in subg. *Synoecia* and subg. *Urostigma*. Plants with such branching are commonly small trees or shrubs. They are light-loving in early stages of forest-succession and they come to abound in secondary forest and open country. Rhythmic growth without very long proximal internodes is found in many species of subg. *Sycidium* sect. *Sycidium* and is characteristic for subsect. *Urostigma*. In these groups the distal internodes of the season's growth are very short and bear only stipules, which are usually (sub)persistent, and may in subsect. *Urostigma* form scaled terminal buds. The parts with very short internodes mark the successive elongations of the branches. In subsect. *Urostigma*, rhythmic growth is often accompanied by deciduousness.

Hemi-epiphytes — Nearly 300 species are (potentially) hemi-epiphytic (banyans or strangling figs) world-wide. This is the life-form characteristic of subg. *Urostigma* (Fig. 1) and it is found in species of subg. *Sycidium* (sect. *Palaeomorphe*, clearly in *F. tinctoria* and *F. virgata*, less clearly in other species of the section). The seeds germinate on branch, trunk, or aerial root, in a crevice or hole, often brought there by ants. Because of the need of light for germination, seedlings are in general found at about 20–25 m above the forest-floor. Soon after germination the hypocotyl swells, becoming tuber-like. This thickened part fixes the seedling in the crevice or hole. The primary root-system soon ceases to develop and becomes replaced by a secondary system of adventitious roots (Prósperi 1998). This produces the extensive aerial root-system, with one (or more) leading root(s) towards the soil and additional roots to anchor the young plant and the leading root(s), and subsequently often results in a system of anastomosing roots forming a basket-work around the branch and trunk the host-tree (Corner 1940; Rao 1966). The upper part of the young fig tree grows slowly until the root-system has reached the soil and provides the plant with sufficient nutrients, reproduction may start then. Thickening of the basket-work of roots is supposed to obstruct sap streams in the trunk and 'strangle' the host-tree. This might be so, but killing by starvation, taking most of the nutrients from the soil and overshadowing the crown of the host-tree, is probably more effective. Many hemi-epiphytic *Ficus* species do not develop secondary root-systems strong enough to overpower host-trees. Fig trees that manage to kill a host-tree in high forest often fall down with the host-tree if the point of gravity of its superstructure is not in line with the trunk of the host-tree. There are few very powerful *Ficus* species of which the root-system can build additional support beyond the trunk of the host-tree, making a wide ('tripod') infrastructure keeping the superstructure upright after the trunk of the host-tree has been destructed. Hemi-epiphytic fig trees that establish closer to the soil, as along rivers or in open vegetation, will more easily kill host-trees and often survive. The diversity of *Urostigma* hemi-epiphytes as with regard to growth form and ecology in lowland rain forest in northern Borneo is described by Harrison et al. (2003).

Hemi-epiphytic species can also be found on rock-surfaces (or man-made walls) as hemi-epilithic trees (Fig. 1, 9). Some African species, *F. abutilifolia* (Miq.) Miq. and *F. tettensis* Hutch., are as 'rock-splitters' even specialized in living on rocks. In the 'banyan' fig trees, of which *F. benghalensis* is the most characteristic representative,

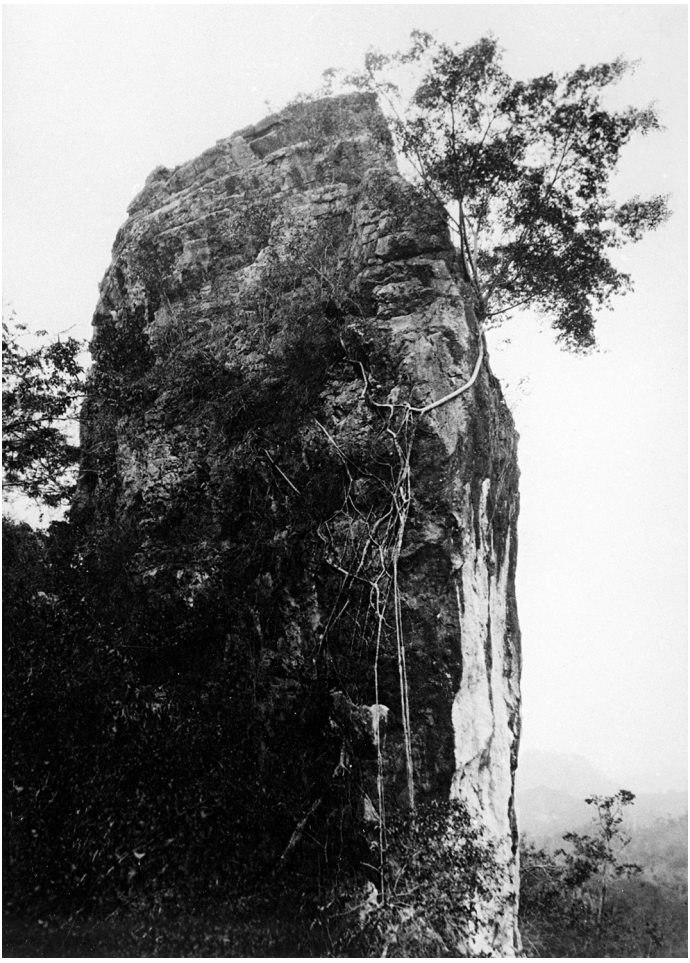


Fig. 9. A hemi-epiphytic fig tree beginning to establish itself on a limestone cliff near Bandung, Java. Photo L. van der Pijl.

adventitious roots drop from the branches, if close near the trunk as a kind of stilt-roots, or if at some distance of the trunk, as pillar roots supporting horizontally growing branches.

The hemi-epiphytic species of subg. *Sycidium* sect. *Palaeomorphe* are not able to produce a strong secondary root-system. The seedlings establish up to some meters from the soil. *Ficus tinctoria* and *F. virgata* form trees, in the latter species up to 30 m tall. The root-systems connecting them to the soil can become extensive. The other species of this section, such as *F. parietalis*, *F. pisifera*, and *F. sinuata*, are predominantly shrubs, being mostly connected with a single tap-root to the soil. Their habit may vary from hemi-epiphitic shrubs to terrestrial shrubs, small trees, scramblers, or climbers. The light requirements for germination are in this group of hemi-epiphytes clearly different than in general for those of subg. *Urostigma*.

Six types of root-systems have been recognized by Fedorov (1959) based on his studies in southern China (Fig. 10):

1) the meshy basket-form sheath, the roots anastomosing but leaving large meshes;
2) the solid-wall basket-form sheath in which the anastomosing roots coalesce more or less completely;
3) the longitudinal ribbed sheath, formed by coalescence of mostly vertically descending roots with little basket-work;
4) the banyan-type which drops numerous adventitious roots from the braches and thus develops a quantity of pillar-roots;
5) the tripod-type, formed when the host is small and its trunk slating so that some roots pass down the trunk and another descends vertically, the result being a sort of tripod when the host has disappeared;
6) the ladder-type, formed when the fig tree develops on a low branch of the host and its radical trunk acquires a ladder-like form leanings against the trunk of the host.

Not all trees are equally suitable as host trees for fig trees; factors that play a role are tree structure in relation to access of light into the crown, frequency of suitable sites for establishing of seedlings, and features of the bark (Michaloud & Michaloud-Pelletier 1987).

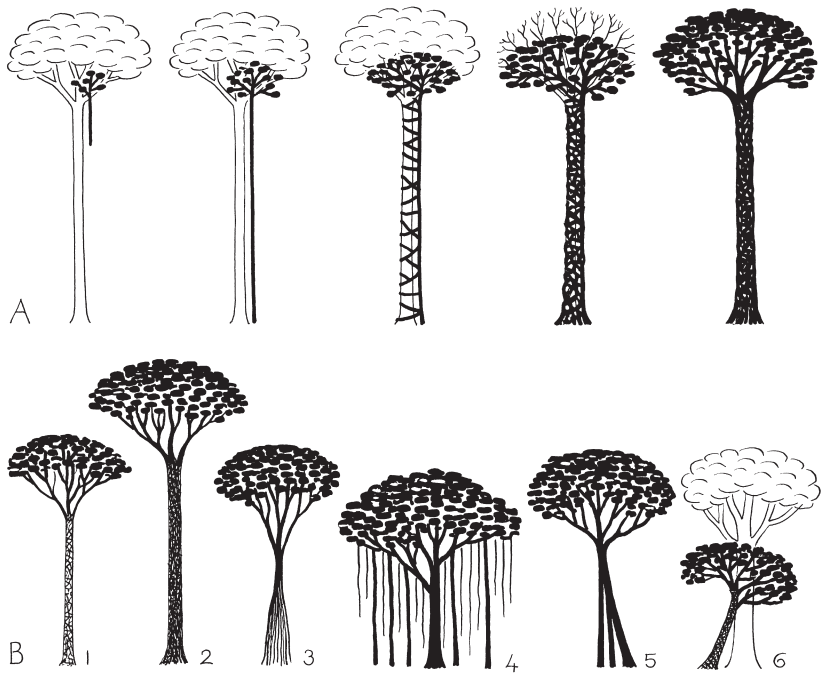


Fig. 10. Hemi-epiphytism in subg. *Urostigma*. A. Development from an epiphytic bush to an independent tree by means of descending and basketing roots (after Corner 1940). B. Forms of root-trunk: 1. meshy basket-form; 2. solid-wall basket form; 3. longitudinally ribbed sheath; 4. banyan-type; 5. tripod-type; 6. ladder-type (after Fedorov 1959).

Climbers — Nearly 100 species of *Ficus* are climbers. The majority are species of subg. *Synoecia*, characterized by sterile stems climbing with short aerial roots and leaves (bathyphylls) quite distinct from those (acrophylls) of the fertile branches without roots and produced when the climber has reached the canopy (Fig. 11, 12). Another group of climbers is constituted by species of subg. *Sycidium* sect. *Palaeomorphe*. They have lax looping stems and branches, which may be attached to supporting trees with aerial adventitious roots and develop satellite shrubs. Such climbers may also use rock surfaces as support and are creepers rather than climbers. Moreover, individuals of *F. oleifolia* (subg. *Ficus*) can be subscandent. *Ficus globosa* and *F. microsyce* and other species of subsect. *Conosycea* (subg. *Urostigma*) are predominantly lianescent, and species of subg. *Urostigma* can exhibit that habit, such as *F. depressa* and *F. sumatrana*. Climbing figs are rare in Africa and America. Some *Urostigma* species are lianoid, climbing with lax whip-like branches: *F. lingua* De Wild. & T. Durand (Africa) and *F. schippii*

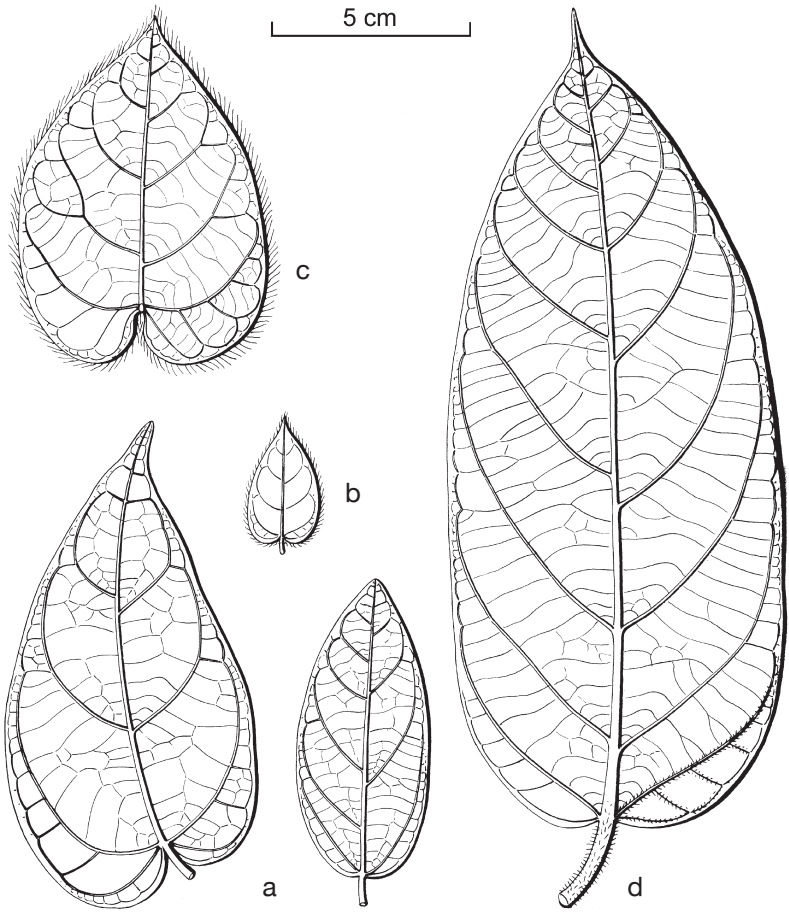


Fig. 11. Bathyphylls and acrophylls in subg. *Synoecia*. a. Bathyphylls and b. acrophyll of *F. recurva* var. *ribesioides*; c. bathyphyll and d. acrophyll of *F. villosa*.

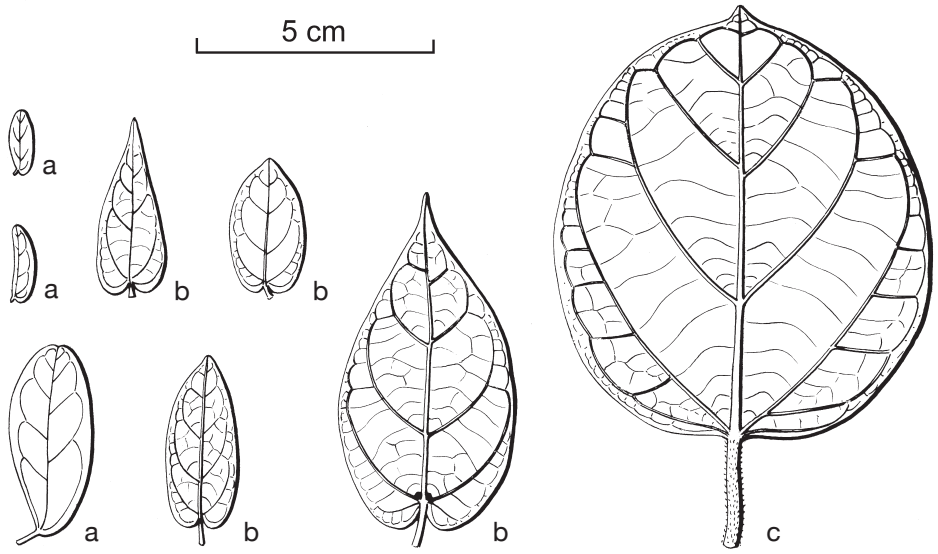


Fig. 12. Bathyphylls and acrophylls in subg. *Synoecia*. a. Bathyphylls and acrophylls of *F. punctata*; b. bathyphylls and c. acrophyll of *F. trichocarpa*.

Standl. (America). One of the African *Sycidium* species, *F. asperifolia* Miq., is a shrub of which the branches can be subscandent. An unusual life-form is described for the American member of subgenus *Pharmacosycea*, *F. crassiuscula* Standl., starting as a rooting climber and becoming hemi-epiphytic, establishing close to the soil (Daniels & Lawton 1991, 1993).

Creeping shrubs — Some species are creeping shrubs: *F. tikoua* Bureau (China) and *F. vaccinioides* King (Taiwan). Stems of *Synoecia* species are often initially on the forest floor before reaching a subject (tree trunk) to climb. Moreover, some species of sect. *Palaeomorphe* (subg. *Sycidium*) are more often creepers than climbers.

Rheophytic shrubs — Some species are rheophytic, low bushy shrubs (with creeping stems) in rocky beds of quickly running streams; their leaves are often lanceolate to linear (see Van Steenis 1981). Species which always or facultatively exhibit this life-form belong to several subgenera: *Ficus* (e.g. *F. ischnopoda*), *Pharmacosycea* (e.g. *F. subtrinervia* and *F. cataractarum* Bureau from New Caledonia), *Sycidium* (e.g. *F. bambusifolia* Seem. from Fiji), and *Sycomorus* (e.g. *F. arbuscula*) and occur from the Sino-Himalayan region to New Caledonia. The two species of subsect. *Macrostyla* (subg. *Sycomorus*), *F. macrostyla* from Borneo and *F. squamosa* Roxb. from the Sino-Himalayan region, are not only adapted to this life-form by habit, but also by the construction of the diaspores (fruits). In the genus *Ficus*, this life-form is confined to the Asian-Australasian region with the exception of the Madagascan *F. polyphlebia* Baker (pers. comm. J.-Y. Rasplus) and possibly also *F. torrentium* H. Perrier. Whether the recently described neotropical *F. salicaria* C.C. Berg (Berg 2004) is rheophytic is to be confirmed.

Holo-epiphytic shrubs — Facultative holo-epiphytism is found in *F. deltoidea* and *F. oleifolia*, often in the former species, sometimes in the latter. Both are species of nutrient-poor substrates.

Indumentum — The genus has a wide range of types of trichomes. Unicellular hairs being short or long, rigid or weak, straight, undulate, crinkled or uncinate, smooth or papillate, septate or aseptate, placed in a socket of supporting epidermal cells (indicated in descriptions as a swollen base) or not (Fig. 13). Rigid hairs may have silicified walls (Beyrich 1942); such hairs may appear stinging, though actually merely irritating, because they break off and remain in the skin. Irritating hairs (or bristles) are known from *F. cucurbitina* (subg. *Urostigma*), *F. halmherae* (subg. *Ficus*), and *F. odoardii*

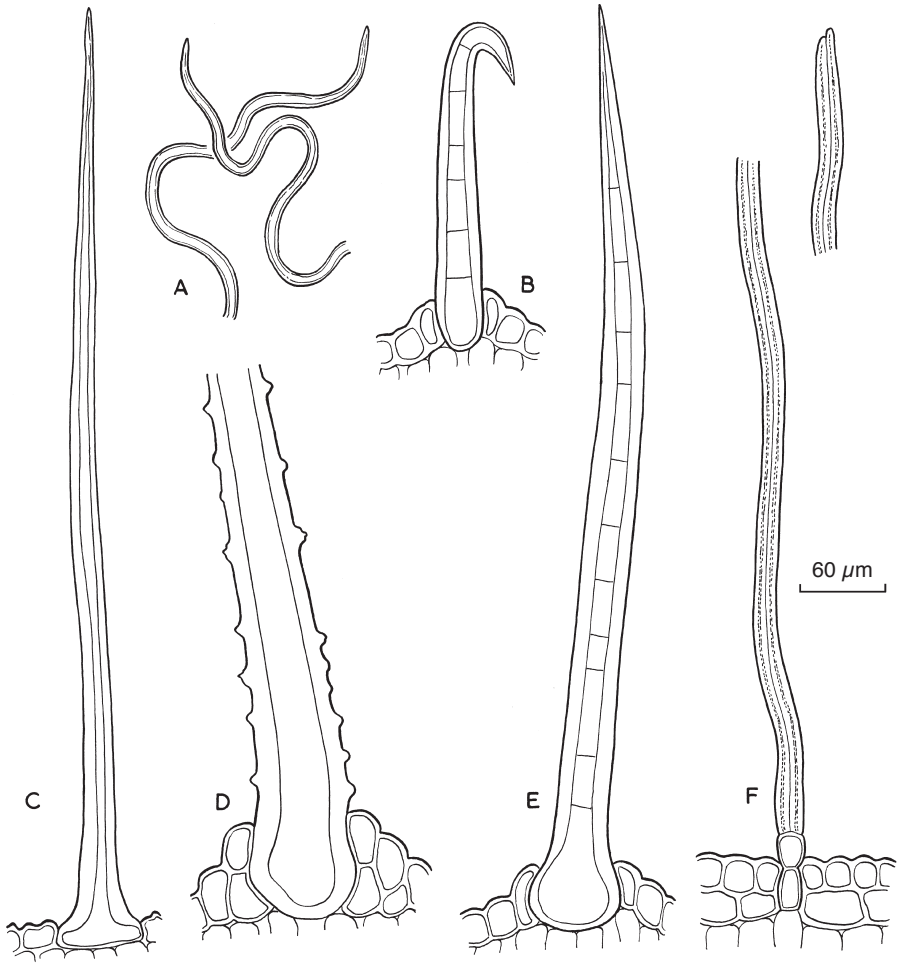


Fig. 13. Hairs of *Ficus*. A. undulate aseptate hairs (*F. grossularioides*); B. uncinate septate hair (*F. recurva*); C. aseptate straight hair (*F. annulata*); D. papillate aseptate straight hair arising from a socket (*F. botryocarpa*); E. septate straight hair (*F. villosa*); F. twinned hair (*F. consociata*).

and related species (subg. *Synoecia*), and *F. pungens* (subg. *Sycomorus*). In appearance rather close to the irritating hairs, of which the setose upper part easily break off from the socket (swollen basis), are (often) less stiff (but often papillate) hairs which do not easily break off. They are rather common in the gyno-dioecious subgenera. The swollen bases may cause rough surfaces.

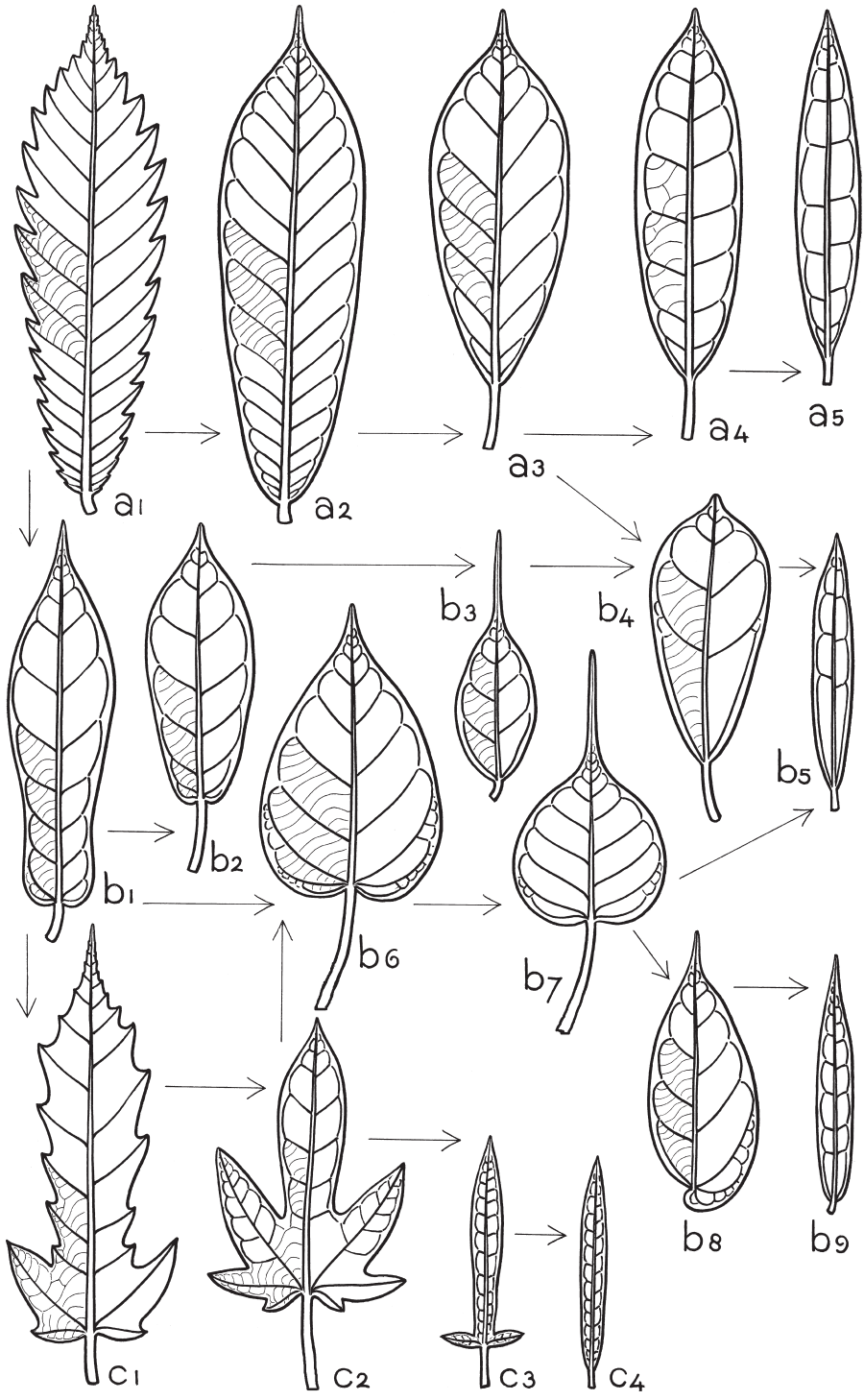
Septate hairs distinguish the climbers of subg. *Synoecia*. Coarsely papillate hairs distinguish sect. *Sycocarpus* and some groups of species of sect. *Sycidium*, but finely papillate hairs occur in various groups of dioecious species. It is possible that the papillate hair is a primitive feature, for it occurs in other Moraceae as *Artocarpus*, but its occurrence is rather capricious for many species with such hairs have also long hairs which are smooth.

Uncinate hairs are only found in *F. asperiuscula* (subg. *Sycidium*), *F. recurva* (subg. *Synoecia*), *F. simplicissima* Lour. (subg. *Ficus*), and also in *F. theophrastoides* (from Fiji and the Solomon Islands). Uncinate hairs are widespread in Moraceae and present in almost all species of the Dorsteniaeae, the other tribe characterized by bisexual inflorescences. Some species of subg. *Ficus*, such as *F. padana*, have felted indumentum consisting of long and thin interwoven hairs. Less conspicuous are usually the submicroscopic pluricellular trichomes (gland-hairs) and cystolith hairs (Fig. 6, 7; see p. 16, 17). The brown elongate multicellular trichomes can be easily seen with the use of a lens. They occur rather frequently in the subgenera *Pharmacosycea* and *Urostigma*, often sparsely, but if densely, they form brown scurfy surfaces as in the Australian species *F. rubiginosa*.

Curious twinned hairs (Fig. 13f) distinguish *F. consociata* and *F. bracteata* (subsect. *Conosycea*); they appear as a combination of ordinary epidermal hairs and microscopic gland-hairs. It should be noted that hairiness is an extremely variable character, densely hairy, thinly hairy, and glabrous forms often occurring in the same species.

Leafy twigs — The leafy twigs often provide differentiating characters as in the indumentum, the diameter, the shape of the cross-section (as terete or angular), the presence of waxy glands, exfoliation of the periderm, and sometimes also the size and distribution of the lenticels on the internodes. The colour of the leafy twig, often in contrast to the colour of the previous season's growth and caused e.g. by loss of indumentum or by exfoliation of the periderm, can be distinctive. Exfoliation of the periderm is a less constant character than exfoliation of the epidermis of the petiole. The internodes of many species, in particular of sect. *Oreosycea* (of subg. *Pharmacosycea*), sect. *Sycidium* (of subg. *Sycidium*), and subg. *Sycomorus*, are hollow or filled with ample pith. The characteristic differences of the diameter of the nodes and the internodes of the dried leafy twigs of species of subg. *Sycomorus* is apparently caused by the anatomy of internodes and nodes.

Leaves — The leaves are spirally arranged (as nearly always in subg. *Pharmacosycea* and subg. *Urostigma*, the exceptions being some African species of the latter subgenus with subopposite leaves, as well as in subg. *Ficus*). The leaves are predominantly distichous in subg. *Synoecia*, but may in some species vary to the arrangement in lax spirals. In the other two subgenera, *Sycidium* and *Sycomorus*, the leaves are arranged spirally or distichous, but in the former subgenus the leaves are sometimes subopposite.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Shape of lamina — The lamina varies from broadest in the middle (and suborbicular to elliptic to oblong to lanceolate to linear) to broadest above the middle (from obovate to obtriangular to spathulate or oblanceolate) to broadest below the middle (and cordiform to ovate to subovate) (Fig. 14). Narrow laminas are sometimes characteristic for the species, as in *F. stenophylla* Hemsl. and *F. celebensis*. In particular in the subgenera *Ficus* and *Sycidium* they may occur as varieties of broad(er) leafed species, e.g. in *F. ischnopoda* and *F. ulmifolia*; this usually affects the number of lateral veins. Leaves with broad laminas, cordiform and broadly ovate usually have long petioles and can be found in all subgenera with the exception of *Pharmacosycea*. In subg. *Urostigma* this type of leave is often associated with dry climatic conditions, in Asia as well as in Africa (e.g. *F. populifolia* Vahl) and in America (e.g. *F. petiolaris*).

Size of lamina — In few species all laminas are very small, 0.5–2 cm long, *F. humbertii* C.C. Berg from Madagascar and *F. vaccinioides* from Taiwan. For the other species some size categories can be distinguished: small laminas (up to c. 10 cm long), medium-sized laminas (c. 10–20 cm long), large laminas (c. 20–30 cm, sometimes to 40 cm long or rarely longer) and very large laminas (50 cm or longer, even up to 2 m long in *F. theophrastoides* (from Fiji and the Solomon Islands)). The small laminas occur frequently in subg. *Synoecia* and in subsect. *Frutescentiae* (of subg. *Ficus*) and rather frequently in subg. *Urostigma*. The medium-sized lamina is the most common one. In groups dominated by medium-sized to small laminas, occasional species with quite large leaves (more than 40 cm long) may occur, such as *F. spiralis* in subg. *Synoecia* and *F. jaheriana* in sect. *Palaeomorphe* (of subg. *Sycidium*). The very large laminas are characteristic of sect. *Dammaropsis* of subg. *Sycomorus*, but the leaves are much smaller in *F. rivularis*.

Symmetry of lamina — The lamina is symmetric (or at most slightly asymmetric at the base) in the subgenera *Ficus* and *Urostigma*. The lamina is mostly symmetric in subg. *Pharmacosycea*, but may be somewhat asymmetric in some species of subsect. *Glandulosae*. In subg. *Synoecia*, the lamina varies from asymmetric to symmetric, the former state often only in the bathyphyll state (see p. 26). Asymmetric laminas often occur in the subgenera *Sycidium* and *Sycomorus*, in the latter in particular in the sections *Hemicardia* and *Sycocarpus*. The presence of waxy glands may be (partly) unilateral in asymmetric laminas. Asymmetry is linked to distichous, or in subg. *Pharmacosycea* subdistichous arrangement of the leaves.

Heteromorphy of lamina — In addition to the dimorphy of leaves in subg. *Synoecia* treated above under climbers, more or less pronounced differences may occur between

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Fig. 14. Leaf-shapes in *Ficus* to show convergence to the lanceolate lamina with few lateral veins and intercostals. Series a, with the subobovate dentate-pinnatifid lamina with numerous lateral veins and short basal lateral veins. Series b, with basal growth leading to the ovate-cordiform lamina or to asymmetric lamina with elongate basal lateral veins. Series c, combining the obovate-pinnatifid lamina with the basal lobing form of the palmate lamina. [The theoretically basic craspedromous venation, a1, is not found in present species, but venation ± clearly transitional between craspedromous and brochidodromous occurs.]

leaves of juvenile plants (sapling) and adult ones, in particular in sect. *Eriosycea* (of subg. *Ficus*) and sect. *Sycidium* (of subg. *Sycidium*). The state of development may affect the dimensions, shape, and features of the margin of the lamina, as well as the number of lateral veins and the length of the petiole. As saplings often flower precociously, they can be mistaken for different species. In some species, as *F. subulata* and *F. virgata*, branching may suddenly introduce much smaller leaves. In species with opposite and distichous leaves, the lamina may change abruptly from symmetric to asymmetric.

Margin of lamina — Palmately and/or pinnately incised laminas occur mainly in the subgenera *Ficus* and *Sycidium*, more often in juvenile plants than in adult ones (as of *F. carica*). They are absent in subg. *Urostigma* and subg. *Synoecia* or rare in subg. *Pharmacosycea* (in juvenile specimens of *F. callosa* and in the African *F. variifolia* Warb.). The margin is often dentate in the subgenera *Ficus*, *Sycidium*, and *Sycomorus*, but not or rarely in the other subgenera, in which a basally dentate leaf margin is found in the African *F. sagittifolia* Mildbr. & Burret (sect. *Galoglychia* of subg. *Urostigma*).

Vernation of lamina — Species with large leaves and well-developed intercostal venation have plicate vernation. Small leaves with few intercostals are convolute. There are transitions, but the derived, convolute state predominates in subg. *Urostigma* and in sect. *Sycidium* in groups with distichous leaves.

Venation of lamina — The venation is basically pinnate and brochidodromous (Fig. 14). Transitions to craspedodromous venation can be found in, e.g., *F. hirta* and *F. pseudopalma* and transitions to palmate venation can be found in some species of subg. *Ficus* sect. *Eriosycea* (e.g., *F. hirta*). More ore less pronounced triplinerved venation is common in the genus. The basal lateral veins are then distinct by the narrower angle of departure from the midrib and by being stronger and often longer, up to 1/2 the length of the lamina, or sometimes up to c. 2/3, especially in laminas with a broad base. In such laminas the basal lateral veins are often branched. The basal lateral veins often provide important diagnostic characters. However, there are also numerous species in which the basal lateral veins are not or hardly distinct from the others, or even weaker. The tertiary venation is basically scalariform with numerous parallel and transverse veinlets (intercostals) between the lateral veins. This pattern differentiates into the reticulate pattern from the midrib to the margin and subsequently in a tertiary venation largely running parallel to the lateral veins, sometimes with tertiary veins almost as strong as the secondary veins, also from the midrib to the margin (Fig. 15). The latter pattern is found in all sections of *Urostigma*, as in *F. sphenophylla* Standl. (America), *F. elasticoides* De Wild. (Africa), *F. elastica* (Asia), and *F. benjamina* (Asia); it is also found in subg. *Pharmacosycea*, mainly in the Neotropics in, e.g., *F. pulchella* Schott.

Texture of lamina — The texture of the lamina varies from thickly coriaceous (as in *F. xylophylla*) to very thin papery (such as in *F. formosana* Maxim. from China). Coriaceous laminas with entire margins are common in subg. *Urostigma*, subg. *Synoecia*, and subg. *Pharmacosycea*. The other subgenera often have chartaceous to subcoriaceous laminas with dentate margins.

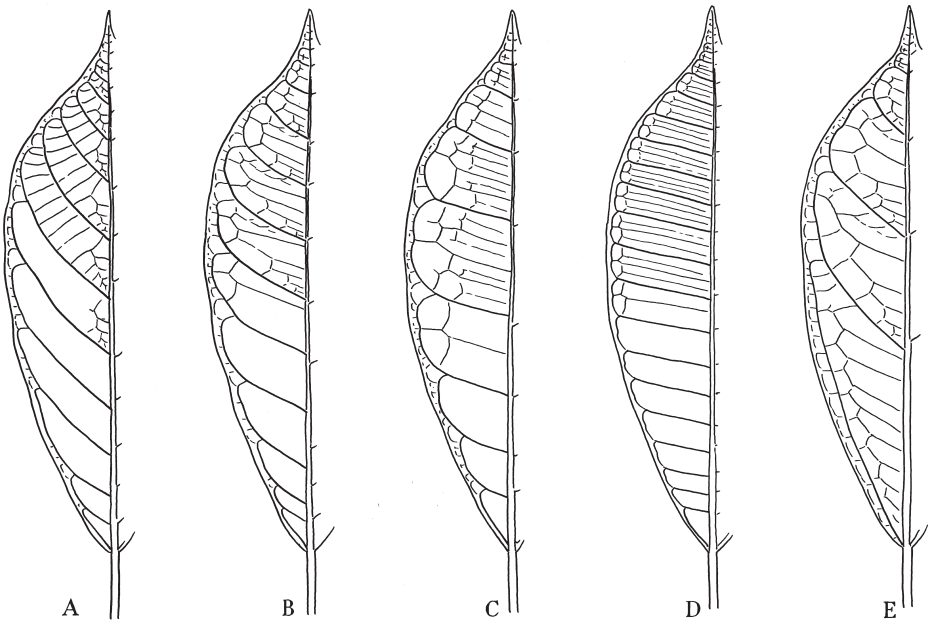

Fig. 15. Differentiation of the tertiary venation of the lamina. A. Tertiary venation scalariform towards the margin, towards the midrib reticulate; B. tertiary venation largely scalariform; C. tertiary venation parallel towards the midrib, reticulate towards the margin; D. tertiary venation largely parallel to the lateral veins; E. as B but triplinerved.

Colour of dried lamina — In most species, the lamina dries brown. In some groups, e.g. subg. *Sycidium* and subsect. *Pedunculatae* (of subg. *Pharmacosycea* sect. *Oreosycea*), 'greenish to greyish dried laminas' are common. This colour differences sometimes have some diagnostic value. In subg. *Sycomorus*, the dried lamina often has a lead-coloured hue above and/or silvery spots.

Petiole — The length of the petiole is related to the shape of the lamina and to the arrangement of the leaves. They are long in spirally arranged leaves with cordiform to ovate laminas (see above), and short in distichous leaves with narrow(er) laminas. In some groups, in particularly those with clearly intermittent growth, as subg. *Urostigma* subsect. *Urostigma* and subg. *Sycidium* sect. *Sycidium*, the petioles often vary in length on the same leafy twig. The epidermis of the petiole can flake off, a process described by La Rosa (1921). Exfoliation of the epidermis is often a useful diagnostic character; in some species, however, the epidermis is flaking off in some specimens but not in others.

Stipules — The stipules are fully amplexicaul in the majority of the *Ficus* species, giving annular scars. In many species, possibly all species of dioecious groups, the stipules are not fully amplexicaul in juvenile stages. The stipules are, however, fully amplexicaul, giving annular scars, in the majority of the species in the adult state. The juvenile trait is retained in many species of subg. *Sycidium*, having semi-amplexicaul

to lateral (subulate) stipules. In some species (as *F. ampelas*) both fully amplexicaul and not fully amplexicaul stipules can be found, even on the same twig. Not fully amplexicaul stipules also occur in subg. *Ficus* subsect. *Frutescentiae*. These are correlated with *Terminalia*-growth. Semi-amplexicaul to lateral stipules are found on the lower nodes of the branches, upwards they are usually fully amplexicaul, but not so in *F. ischnopoda* and *F. tuphapensis* (from China and Indochina). The stipules may be persistent or subpersistent along the leafy twigs and may hide the figs. In several groups with intermittent growth the distal internodes of the twigs can be very short and the stipules persistent, in small apical tufts as in subg. *Ficus* subsect. *Frutescentiae* and subg. *Sycidium* sect. *Sycidium*, or scale-like and forming terminal buds as in subg. *Urostigma* subsect. *Urostigma*.

The stipules are often conspicuous as terminal bud covers. They can be longer than 10 cm in *F. elastica* and *F. insipida* Willd. (Neotropics). Stipules on opening shoots (flush) can be much longer than those of normally growing branches.

In numerous species of subg. *Urostigma*, the figs are initially enclosed in calyptrate bud covers, usually with texture and indumentum similar to those of the stipules. They are formed by two fused scale-leaves (or prophylls) subtending the inflorescences (Golenkin 1894; Bernbeck 1932). These bud covers are mostly small, but in some specious conspicuous, even up to 2.5 cm long in *F. cucurbitina*. The calyptrate bud cover pairs may enclose single figs as is often the case in subsect. *Conosycea* or pairs as in some species of this subsection, e.g., *F. glaberrima*. Enclosure of pairs of figs is usual in sect. *Galoglychia* (Africa) and sect. *Americana*. In the latter case the scale-leaves are apparently the prophylls.

Waxy glands — Waxy glands are nearly always present on the plant. They can be found on the leafy twigs, in pairs on the nodes in many species of subg. *Sycomorus*, in particular of sect. *Sycocarpus*, in some species of subg. *Ficus* (as in *F. glandulifera* and allied species), and in *F. laevis* (of subg. *Synoecia*). In other groups the waxy glands are confined to the lamina, mostly only on the lower surface. Subg. *Urostigma* is characterized by a single waxy gland at the base of the midrib. In the other subgenera there are commonly at least two waxy glands, one in each of the axils of the lateral veins. In asymmetric laminas, the waxy gland might be absent from the axil of the basal lateral veins at the narrow side of the lamina. Additional, smaller waxy glands may often be present in the axils of other lateral veins or in the axils of branches or in furcations of lateral veins. Such additional waxy glands are absent in subg. *Urostigma*. They may occur in the axils of other lateral veins at both sides of the midrib or only unilaterally (as in several species of subg. *Sycidium* sect. *Palaeomorphe*). Waxy glands are absent in the majority of the species of subg. *Sycomorus* sect. *Sycocarpus*, but then there are usually small waxy glands in the axils of some lateral veins in the middle (or also the upper) part of the lamina. The waxy glands may occur in slit-shaped extensions of the axils of lateral veins, as in some species of subg. *Sycomorus* sect. *Neomorphe* and sect. *Sycocarpus*. They may be found laterally on the base of the midrib rather than in the axils of the lateral veins. In *F. schumanniana* (sect. *Sycidium*) the two glands are fused into a single median one (similar to the situation in subg. *Urostigma*).

In groups in which the waxy glands are usually present, they may be absent in some species, e.g. *F. badiopurpurea* and *F. eustephana* (of subg. *Sycidium* sect. *Sycidium*), *F. erythrosperma* (of subg. *Sycomorus* sect. *Adenosperma*), *F. benguetensis*, *F. pleyteana*, and *F. saurauioides* (of subg. *Sycomorus* sect. *Sycocarpus*), and several species of subg. *Ficus*, in which the absence of waxy glands on the lamina is often compensated by their presence on the nodes of leafy twigs. In a number of species waxy glands may be present on some leaves (or individuals) and absent on others. Waxy glands appear to be (always) absent in all species of subg. *Pharmacosycea* subsect. *Pedunculatae*. Unusual is the presence of waxy glands on the upper surface of the lamina, at the junction of lamina and petiole. This adaxial position is known from *F. salomonensis* Rech. and *F. theophrastoides* (of subg. *Sycomorus* sect. *Dammaropsis*) from the Solomon Islands. They might occur in some other (large-leafed) species as well, but they are difficult to detect with certainty in dried material.

The anatomical features of these glandular spots is treated above.

Deciduousness of leaves — Deciduous is usually associated with intermittent growth of trees (see p. 23) and climatical conditions. The period in which the tree is without leaves varies and may be only one or two days. Deciduousness is characteristic for subsect. *Urostigma*. It seems to be absent in the subgenera *Sycidium* and *Sycomorus*, in the former subgenus even in species with intermittent growth. Species that can be deciduous in the monsoon climate may be evergreen in the rain-forest climate.

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INFLORESCENCES (FIGS)

The inflorescences of *Ficus*, the syconia or figs, are unique as they enclose both staminate and pistillate flowers during anthesis. Urceolate inflorescences are also found in *Sparattosyce*, but in this genus the stigmata are outside the opening of the receptacle and the staminate inflorescences split open to expose the anthers. One can consider the basic structure to be an involucrate discoid head, similar to that of Compositae, except for the

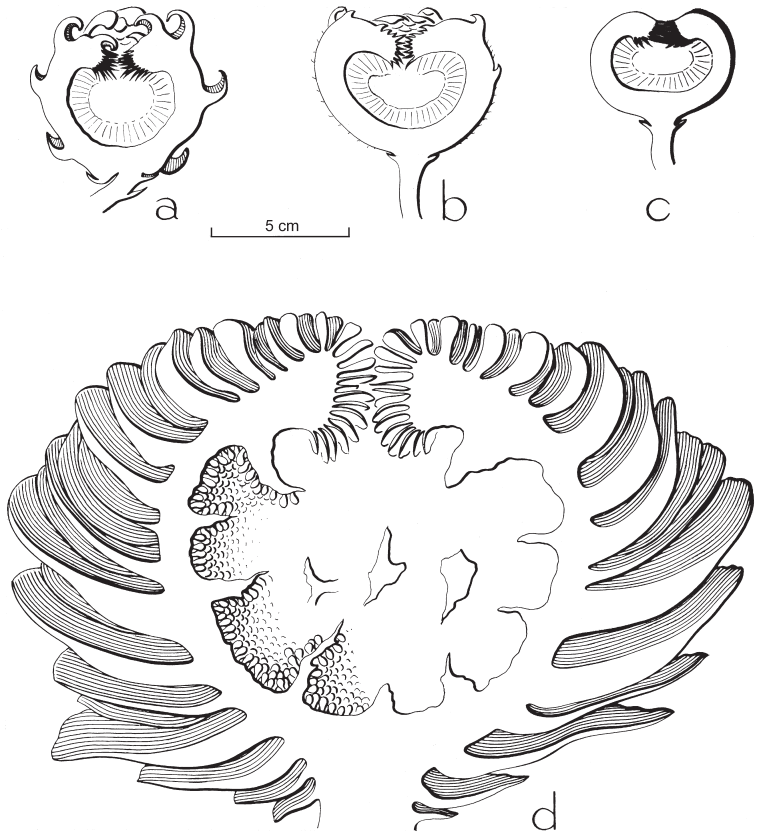

Fig. 16. Syconia of sect. *Sycocarpus* showing the loss of lateral bracts and the definition of the peduncle. a. *F. uncinata*; b. *F. satterthwaitei*; c. *F. septica*; d. *F. dammaropsis*.

cymose arrangement off the flowers (Fig. 16; Corner 1978). This could be so for subg. *Sycidium* and for subg. *Sycomorus* (at least pro parte), or even for subg. *Pharmacosycea* in which both in the Old and New World lateral bracts occasionally occur, but for those subgenera not showing any trace of lateral bracts, *Ficus*, *Synoecia*, and *Urostigma*, it is doubtful. The occurrence of caducous basal bracts in the latter two subgenera makes it uncertain whether basal bracts and ostiolar bracts (which are always persistent) are (fully) homologous. The constant numbers of basal bracts (and even peduncular bracts) may also indicate lack of full homology.

The enclosure of the flowers is realized by the involution of the margins, leaving only a narrow entrance, the ostiole. In several species of subg. *Sycidium* and subg. *Sycomorus* all the bracts persist, but in the majority most of the bracts disappear. In all subgenera the margin of the receptacle bears many rows of imbricate and often interlocking bracts, as ostiolar bracts closing more or less tightly the entrance to the interior of the fig. In most subgenera a whorl of 2 or 3 bracts remained at the base of the receptacle, basal bracts.

In most species of subg. *Sycidium* and in some species of subg. *Pharmacosycea*, the 2 or 3 bracts occur not in a whorl but scattered on the peduncle, peduncular bracts. The bracts on the outer surface of the receptacle, lateral bracts, are found in many species of subg. *Sycidium* and subg. *Sycomorus*; they are occasionally found in subg. *Pharmacosycea*, but are absent in the other subgenera. Lateral bracts can be large and numerous, (largely covering the outer surface of the receptacle) or few and then mostly small and scattered. Bracts (often in constant numbers) surrounding the ostiole are indicated as apical bracts. Bracts among the flowers, interfloral bracts, occur only in the subgenera *Pharmacosycea* and *Urostigma*; in subg. *Pharmacosycea*, the interfloral bracts are often on the pedicel, sometimes up to the perianth and indistinguishable from the tepals. Interfloral bracts are absent in the other subgenera; in subg. *Sycomorus*, however, two (or three) bracteoles subtend the staminate flowers in the majority of the species (see, e.g., Fig. 21h,; 59f, g; 82c; 88d). The inner surface of the receptacle can be hairy, mostly with bristle-like hairs. Such hairs are common in the groups with dioecious species (subgenera *Ficus*, *Sycidium*, *Sycomorus* for the greater part, and *Synoecia*), but are also found in some groups of subg. *Urostigma* (subsect. *Urostigma*) and subg. *Pharmacosycea* (subsect. *Pedunculatae*).

The syconia are sessile or pedunculate. In numerous species, both with pedunculate and sessile figs, the base of the receptacle is stipitate. Stipes are rare in subg. *Urostigma* and occur in general in Malesia more frequently than in Africa (found in *F. cyathistipula* and some related species of sect. *Galoglychia*) and the Neotropics (found in some species of sect. *Pharmacosycea*: *F. guajavoides* Lundell and *F. tonduzii* Standl.). The shape of the receptacle is (almost) globose, but varies to depressed-globose to pyriform to ellipsoid to oblongoid or to cylindrical. The receptacle varies in size from 2–3 mm in diameter when dry (as in several species of subg. *Sycidium* sect. *Palaeomorphe*) to about 10–13 cm in *F. dammaropsis*. Figs of such dimensions are uncommon, they can be found in some species of subg. *Synoecia* (e.g. *F. punctata*) and of subg. *Sycomorus* (e.g. *F. auriculata*); the up to 10 cm long ellipsoid figs of *F. hesperidiiformis* (of subsect. *Malvanthera*) may also be included in this category. Such large figs are even rarer in other parts of the tropics; they are known from a Madagascan form of *F. sycomorus* L. (‘*F. skalavarum*’), from the African *F. sansibarica* Warb., and the neotropical *F. gigantosyce* Dugand. The often considerable variation in size of the receptacle (and, consequentially, also the number of flowers per inflorescence) in many species is a remarkable phenomenon.

The receptacle remains closed in nearly all species. In some species of subg. *Ficus* subsect. *Eriosycea*, ‘gall-figs’ split open at maturity; this is also found in the African *F. asperifolia* (subg. *Sycidium*).

The receptacles of many species of subg. *Sycomorus* are filled with watery to gelatinous liquid during the interfloral phase. Such liquid rarely occurs in species of other groups; its presence is known for *F. conocephalifolia* (of subg. *Sycidium*); it is also found in some species of subg. *Urostigma* sect. *Galoglychia* (subsect. *Caulocarpae*) and sect. *Americana* (pers. comm. F. Kjellberg). Males of fig wasps, both pollinating ones and others, are provided with respiratory adaptations to this environment; leaving the ‘gall-fruits’ before the females, they may still encounter liquid in the fig (Compton & McLaren 1989).

Anatomy and embryology — Details about the developmental anatomy of the syconium, flowers, ovules, and fruits and about embryology, often with references to functional aspects, can be found in studies by Johri & Konar (1956) on *F. religiosa* and by Verkerke (1986, 1987a, 1987b, 1988a, 1988b) on some African species.

Ostiole — The ostiole is small as often in subg. *Synoecia* to large as often in subg. *Sycomorus*. The outer (= visible) ostiolar bracts are numerous, as usually in subg. *Sycomorus* and subg. *Sycidium*, to few (in subg. *Urostigma* only 2 or 3). In the latter subgenus the outer ostiolar bracts can be long and inflexed, creating a slit-shaped or tri-radiate entrance to the interior of the fig, as in all species of sect. *Galoglychia* (nearly always slit-shaped) and most species of sect. *Stilpnophyllum* (slit-shaped or tri-radiate). In the other species of subg. *Urostigma*, the ostiole is circular and the upper 2 or 3 visible bracts are imbricate, but in many species of subsect. *Conosycea*, they are short and make the ostiolar bracts underneath visible; there can be a pore if the lower ostiolar bracts are also short (as in *F. pellucidopunctata*). The upper ostiolar bracts are usually interlocking and the lower ones usually longer and descending, sometimes far into the interior of the fig (often as a plug in species of subg. *Sycomorus*; see Verkerke 1988b). In the American section *Pharmacosycea* the upper ostiolar bracts are interlocking and closing the entrance, but lower down in the ostiole the bracts are relatively short and ± descending, leaving a tunnel-like space towards the interior of the syconium, rather similar to the construction of the ostiole of the sections of *Urostigma* with a slit-shaped aperture of the ostiole (Ramirez 1974).

The ostiolar bracts are usually tight (not allowing insects to enter or leave syconia undamaged), but in subg. *Ficus* and subg. *Sycidium* they might be looser temporarily at the receptive phase of the syconium (see Okamoto & Tashiro 1981; Verkerke 1987b) and even looser when the female wasps are leaving the syconium, so that they can get outside the syconium undamaged. The ostiole is usually superficial, but it may be sunken in the apex of the receptacle (as often in subg. *Synoecia*) or sometimes even in a protracted apex of the receptacle (as in *F. baeuerlenii*).

Wall of the receptacle — The wall of the fig may consist of entirely thin-walled cells crossed by vascular bundles and latex-tubes, or it may contain sclerotic cells. In subg. *Urostigma*, the sclerotic cells are typically in two layers, a thin outer layer below the outer surface and a thicker inner layer next to the flowers. The dried fig often cracks into these two layers. In other groups the sclerotic cells are either confined to the inner layer and resembles somewhat the endocarp of a 'drupe' with mesocarp and exocarp formed by other layers of the fig wall. The sclerotic cells may also occur diffusely throughout the wall, as in several species of subg. *Pharmacosycea*. The presence and distribution of sclerotic cells may differ between 'gall-figs' and 'seed-figs' of the same species. In many species of subsect. *Malvanthera* (subg. *Urostigma*) the fruits are partly or entirely embedded in the wall of the fig, by proliferation of tissue from the inner layer of the receptacle. The wall of these species is different as the outer layer seems to become detached from the inner layer containing the fruits.

Colour of mature receptacle — Figs may remain greenish (or to slightly yellowish or brownish) at full maturity. That is often the case in relatively large figs. More often, in particular in small ones, they change colour, ripening yellow to orange and red, or pink

to red. Purple or black at full maturity are less common colours, e.g. found in species of sect. *Urostigma* (in particular subsect. *Urostigma*), in some *Synoecia* species (e.g. *F. pumila* and *F. punctata*), and in *F. carica*. Entirely purple or black ripe figs do not occur in African and American species. 'Gall-figs' often do not get the colours of 'seed-figs' in full maturity, they remain greenish or get paler colours. Colour dimorphy occurs in some species, e.g. in *F. variegata*. Colour differentiation is suggested to be related to evolution of primate colour vision (Dominy et al. 2003).

Internal hairs — Internal hairs (or bristles) occur frequently in the gynodioecious subgenera, thus those lacking interfloral bracts, and may be (or have been) functional substitutions of those bracts. These hairs are often bristle-like and vary in colour from white to brown. They are particularly well developed in subg. *Ficus* subsect. *Auratae*. They are absent in subg. *Sycomorus* sect. *Sycomorus* subsect. *Sycomorus*. In species in which internal hairs are present, they may vary from abundant to sparse (or absent). In the monoecious subgenera, internal hairs can be found (among interfloral bracts) in subg. *Urostigma*, frequently in subsect. *Urostigma*, less often in subsect. *Conosycea* (and sect. *Americana*). The hairs are often a useful diagnostic feature and can be easily seen with a hand-lens in dried material.

Sexuality — In monoecious species, all species of subg. *Pharmacosycea* and subg. *Urostigma* and some species of subg. *Sycomorus*, adult trees bear syconia containing staminate flowers and pistillate flowers with variable style-length and able to produce seeds. The (functionally) dioecious species, all species of the subgenera *Ficus*, *Sycidium*, *Synoecia*, and most species of subg. *Sycomorus*, have individuals bearing syconia with staminate flowers and pistillate flowers with short styles, which (normally) cannot produce seeds, and other individuals bearing syconia with long-styled flowers which can produce seeds and often neuter flowers (substituting the staminate ones). It is remarkable that, although the ovules appear to be normally developed, ovaries of short-styled flowers do not produce seeds. The process of the loss of the female function, as often found in short-styled morphs of heterostylous species, is apparently arrested at the point that the ovules can still develop tissues (through fertilisation or otherwise) to feed insect larvae.

Position of the figs — The syconia are often axillary, mostly in pairs, but in subg. *Pharmacosycea* mostly solitary. The syconia may in some species also be found below the leaves, on previous season's growth. That is often the case in species with rhythmic (and seasonal) growth and it ensures production of figs (the year round) independently from growth of the twigs. In some groups, such as subg. *Urostigma* subsect. *Urostigma*, subg. *Synoecia* subsect. *Punctulifoliae*, and subg. *Sycidium* sect. *Palaeomorphe*, minute leafless branchlets (spurs) may develop in the leaf axils. These spurs often bear more than two figs simultaneously and they usually continue to grow and bear figs below the leaves down to the smaller branches (ramiflory). As the syconia of ramiflorous species generally turn red at maturity, the correlation may be associated with dispersal by birds. In other groups, such as subg. *Sycidium* sect. *Sycidium* and subg. *Sycomorus*, spur-like branchlets usually develop on the smaller branches and continue to grow on thicker branches down to the trunk (cauliflory). These fig-bearing branchlets often

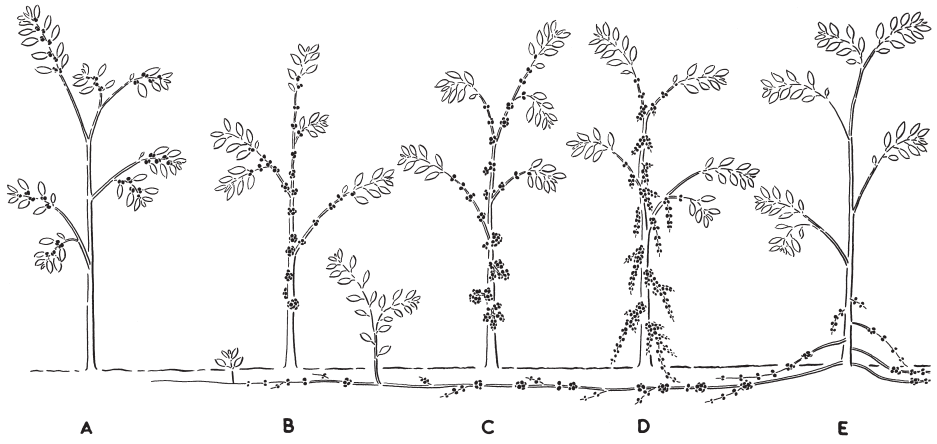

Fig. 17. Diagram of the evolution of flagelliflory (geocarpy) in sect. *Sycocarpus*. A. With axillary figs as in *F. lepicarpa*; B. with sessile fascicle of figs as in *F. scortechinii*; C. with cauline branchlets bearing fascicles of figs as in *F. schwarzii*; D. with long hanging cauline branchlets with fascicles of figs as in *F. hispida*; E. with subterranean stolons proliferating in new shoots as in *F. uncinata*.

ramify and become tuberculate structures which may bear numerous figs. In the same groups, but in subg. *Sycomorus* more frequently than in subg. *Sycidium*, leafless fig-bearing branchlets with long internodes may develop on the thicker branches and the trunk (Fig. 17). Such branchlets can become hanging and some meters long. The situation in which the fig-bearing branches are (almost) confined to the tree-trunk can be indicated as tronciflory. In several species the leafless fig-bearing branches develop (only) at the base of the trunk and can become stolon-like, trailing (and rooting) in the forest floor or in the litter (flagelliflory or geocarpy). At some distance from the trunk such branches may start to grow upwards and become leafy, establishing satellite trees. In cauliflorous and flagelliflorous species fig-production is fully independent from the growth (rhythm) of vegetative parts and it also allows leptocaul species to produce large syconia. There are species, e.g. *F. hispida*, in which the figs can be born axillary, cauliflorous, and flagelliflorous.

Ramiflory is also found in groups of species of subg. *Urostigma* sect. *Americana* (*F. caballina* Standl. and allied species) and the African section *Galoglychia* (subsect. *Crassicostatae*). Cauliflory does not occur in American species of *Ficus*, but in Africa it occurs in subg. *Urostigma* sect. *Galoglychia* (subsect. *Caulocarpae*) and in subg. *Sycomorus*. In the former group figs are born on peg-like spurs, in *F. sansibarica* Warb. up to 10 cm long. In the latter group the figs are born on leafless branchlets with long internodes; *F. vogeliana* (Miq.) Miq. (of subg. *Sycomorus*) is flagelliflorous.

Flowers — The flowers are unisexual, at least functionally. The perianth is and remains both in staminate and pistillate flowers membranaceous. The number of tepals vary from (2 or) 3 to 6. They are free or connate, and glabrous or hairy. Their colour varies from whitish to red.

Number of flowers — The number of flowers is related to the size of the receptacle (Berg 1990), varying from about 10 in very small figs (or in *F. oleifolia* subsp. *monantha* only one) to 5,000–7,000 as in *F. pumila* (Hill 1967), more than 12,000 as in *F. auriculata* (Cunningham 1889), or in figs of the Madagascan *F. sakalavarum* Baker (included in *F. sycomorus*, Berg & Wiebes 1992) even more than 21,000 (Kjellberg et al. 2001 and electronic appendix). As a rule, there is a positive correlation between size of the figs and size of the flower, and usually also of the fruits, but not always (see e.g. *F. deltoidea*; Fig. 18d, 19a). In the same species, syconia of the same size may contain considerable differences in numbers of flowers (Berg 1990). One can expect differences in numbers of flowers in syconia of the same size between monoecious and dioecious species because of denser packing of flowers in the former ones. Moreover, there appears to be different numbers of flowers in 'seed-figs' and 'gall-figs' (see Verkerke 1987b).

Staminate flowers — The staminate flowers of some species of subg. *Sycidium* sect. *Palaeomorphe* contain pistils as large as the pistillate flowers, but they do not produce seed. Pistillodes are found in all species of subg. *Sycidium*. They are often pistil-like with an ovary part and a style part, but can be subulate. Subulate pistillodes often occur in staminate flowers of subg. *Pharmacosycea* and neuter flowers of sect. *Kissosycea* (subg. *Synoecia*; see Corner 1939), but only occasionally in other subgenera.

Staminate flowers occur in one or more rows near the ostiole or are disperse among the pistillate flowers. The occurrence of both peripheral and disperse distribution of staminate flowers can also be found in the genus *Dorstenia*. Ostiolar staminate flowers occur in all species of *Sycidium* and *Sycomorus*. In the other genera some (groups) of species are ostiolar and others disperse. The staminate flowers are mostly pedicellate, in subg. *Synoecia* sect. *Synoecia* with very long pedicels, but they are mostly (sub)sessile in subg. *Synoecia* sect. *Rhizocladus*. The tepals are free and usually enclose the anthers before anthesis in most subgenera. They are always connate in subg. *Sycomorus* and often in subg. *Pharmacosycea*.

The number of staminate flowers per syconium varies considerably. Circa 10% of the flowers being staminate per syconium is an average, but it may vary to (near) 0 as in subg. *Urostigma*, or it may vary up to 50% or occasionally even 100% in subg. *Synoecia*. The number of staminate flowers per inflorescence is significant for the way of pollination, active versus passive (see p. 55).

The staminate flowers of most subgenera contain 1 or 2 stamens, or sometimes 3 (e.g. in subg. *Pharmacosycea*). In subg. *Ficus*, the number varies from 1 to 5. The anthers are small to 10 or more times as large as the smallest. Such large anthers occur in subg. *Pharmacosycea* sect. *Pharmacosycea*, subg. *Synoecia* sect. *Rhizocladus*, and in species of subg. *Sycomorus* with large syconia. The variation in number and size of the anthers makes that the amount of pollen produced per syconium varies tremendously. The anthers open with a narrow slit (allowing pollinators to remove pollen) as in subg. *Urostigma*, or they may open widely (to dust pollinators with pollen) as often in subg. *Sycidium*. The anthers of subg. *Urostigma* subsect. *Malvanthera* have only one theca and that theca may be transversely attached to the filament, giving a peltate structure.

Anthesis of the staminate flowers coincides with the maturity of seeds. Anthesis is often preceded by elongation of the filament to expose the anther. That is a necessity

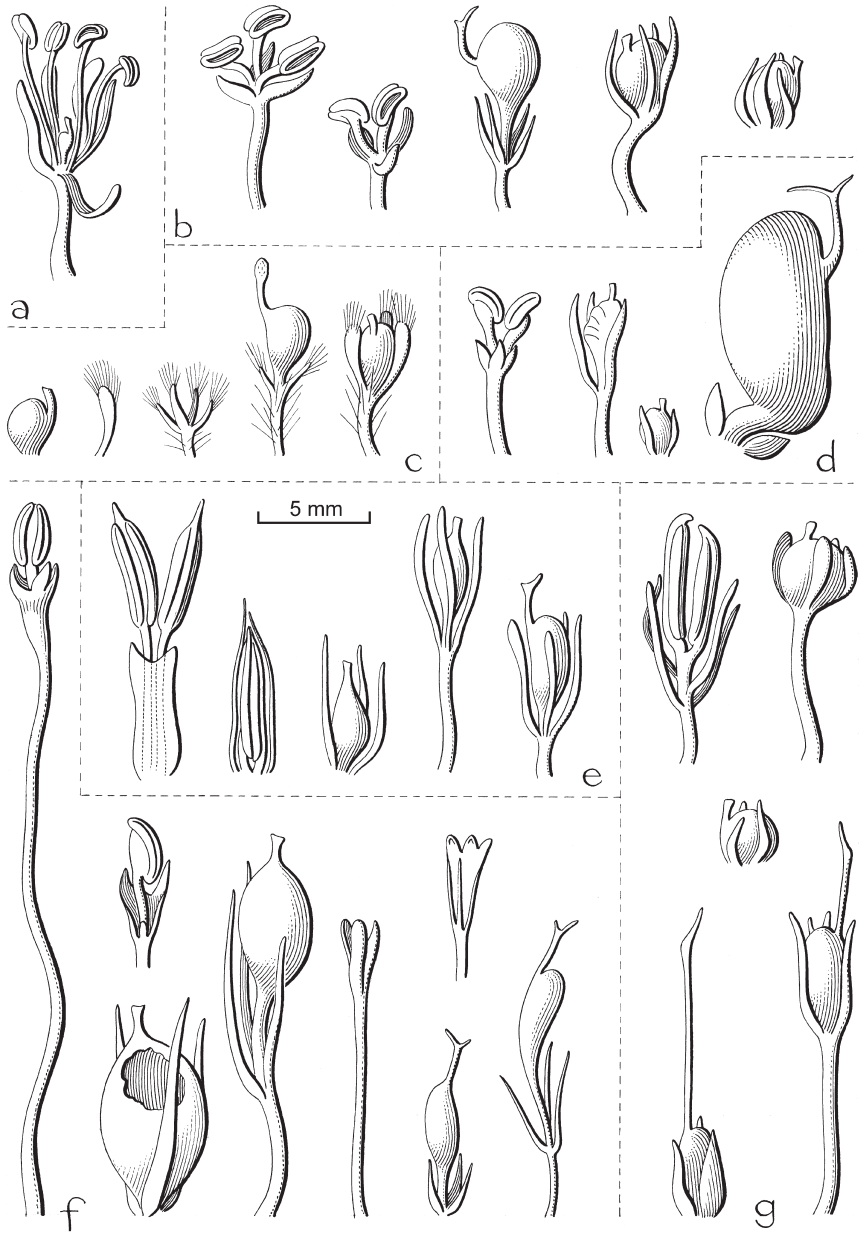

Fig. 18. Flowers of subg. *Sycidium* sect. *Sycidium* (a), subg. *Ficus* (b–d), and subg. *Synoecia* (e–g). a. *F. henryi*, staminate flower with pistillode; b. *F. ischnopoda*, staminate flowers, long- and short-styled pistillate flowers; c. *F. aurata*, long- and short-styled pistillate flowers, perianth, tepal, and ovary; d. *F. deltoidea*, staminate flowers, short-styled flowers, long-styled flower in fruit; e. *F. trichocarpa*, staminate flowers, short- and long-styled flowers; f. *F. punctata*, staminate flowers, short-styled flowers, neuter flowers, long-styled flowers; g. *F. odoardii*, staminate flower, short- and long-styled flowers.

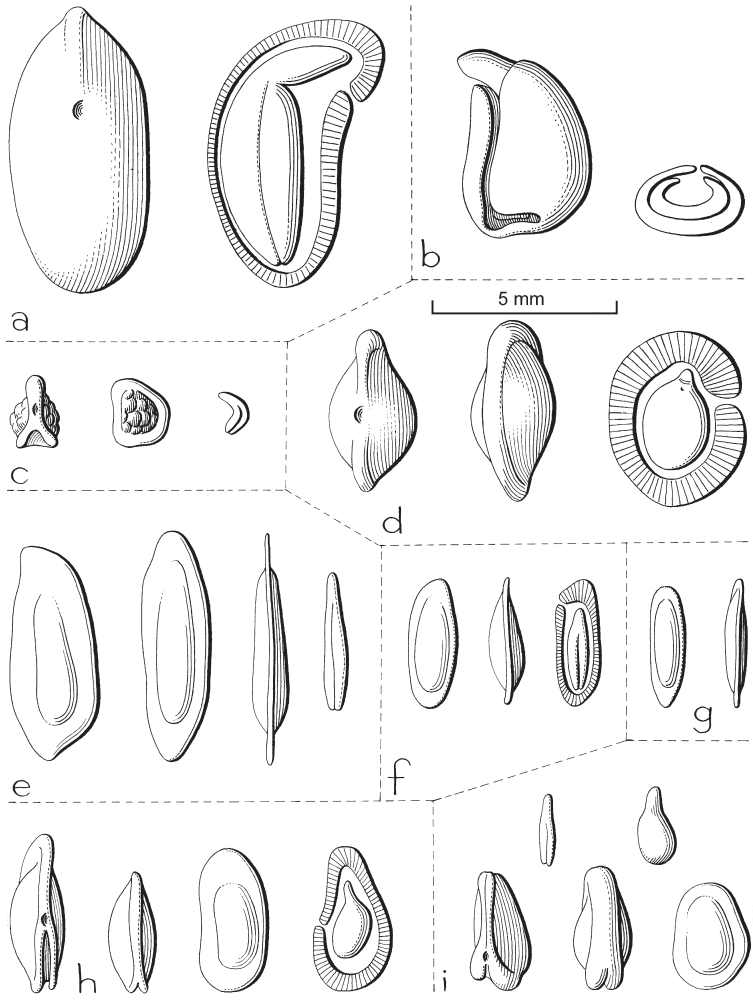

Fig. 19. Fruits (achenes) and embryos of subg. *Ficus* (a–c), subg. *Synoecia* (d–g), and subg. *Sycomorus* sect. *Adenosperma* (h, i). a. *F. deltoidea*; b. *F. pustulata*; c. *F. fulva*; d. *F. trachycoma*; e. *F. hypophaea*; f. *F. sagittata*; g. *F. allutacea*; h. *F. trichocerasa*; i. *F. adenosperma*.

for the stamens of most of the species of subg. *Sycomorus*, as the stamens are packed inside the tubular perianth. By elongation of the filaments the upper part of the perianth is torn off. If the flowers are hidden below the layer of stigmata, as usually in subg. *Urostigma*, then elongation of pedicels may also play a role in exposing the anthers.

Pistillate flowers — The styles of the flowers of monoecious species differ in length. Usually short-styled and long-styled flowers can be distinguished. The number of intermediate style lengths varies. Long-styled flowers are mostly sessile and short-styled ones are always pedicellate and the ovaries tend to be longer than those of the long-

styled flowers. The compensating differences in lengths make that the stigmas are situated at the same distance of the wall of the syconium. Long styles are relatively thin and, in particular in groups with coherent stigmata, often not straight. The stigmas can be coherent forming a synstigma (as in subg. *Urostigma*, excl. sect. *Stilpnophyllum*). Stigmata of the long-styled flowers of *F. disticha* and related species and those of species of subsect. *Sycocarpus* and, e.g., *F. fulva* (see Jousselin & Kjellberg 2001: 155) are also cohesive. The ovaries are usually arranged in two layers. In dioecious species the pistillate flowers in syconia with staminate flowers are short and do not produce seeds, although the ovules appear to be sufficiently developed to do so. The styles of the flowers in the syconia with only pistillate flowers (or also neuter flowers) are long and the flowers can produce seeds. The ovaries are usually arranged in a single row during anthesis. Development of pedicels happens largely after anthesis. If the stigmas are not touching each other, then tips of internal hairs may fill gaps. If the staminate flowers occur among the pistillate ones, then they are usually still below the layer of stigmas, but they (and neuter flowers) are emerging and interrupting the layer by long pedicels in subg. *Synoecia* sect. *Kissosycea* (see Corner 1939). A continuous layer of free, loosely connected, or cohesive stigmata (stigmatic platform) plays an important, if not essential role in pollination and oviposition procedures. Heterostyly in monoecious species is ontologically determined and imperfect. That in the dioecious ones is genetically determined and the short-styled morph has lost the female function, but the ovules are still in a state that they can develop tissues to supply food to insect larvae.

The tepals are free but connate forming saccate perianths enclosing the ovary and the perianth with a narrow opening or tubular extension of the perianth letting through the style are found in subg. *Sycomorus* p.p. (see Fig. 20f, g). In the same subgenus as well as in subg. *Synoecia* sect. *Kissosycea* the tepals can be linear to subulate (see Fig. 18e–g; Corner 1939). In subg. *Sycomorus* sect. *Sycocarpus* the perianth of long-styled flowers can be reduced to a short cup or narrow rim (see Fig. 20g, j), thus generally quite distinct from that of the short-styled flower. The long-styled flowers of *F. uncinata* lack a perianth *(*see Fig. 20i). In subg. *Pharmacosycea* (Fig. 21f, g) the style mostly bears 2 subulate stigmas, often different in length, sometimes only 1; they are not conspicuously papillate. Similar stigmas occur in the long-styled flowers of subg. *Ficus* and subg. *Synoecia*. In subg. *Urostigma* (Fig. 21a–e) the style has usually only one stigmatic arm, sometimes 2 of different length. The stigma is conspicuously papillate. Otherwise, the stigma is truncate to clavate, subpeltate, infundibuliform or flame-shaped elongate, and mostly more or less papillate. The styles varies from apical to lateral and in subg. *Sycomorus* sect. *Adenosperma* to gynobasic.

Neuter flowers — They are found in all groups of dioecious species in figs with long-styled pistillate flowers as substitutes for staminate flowers (disperse or ostiolar). They consist of reduced tepals and sometimes an abortive stamen. They are often conspicuous in subg. *Synoecia*.

Fruits — The pericarp consists of (two) or three layers of cells. The cells of the inner layer (endocarp) becomes sclerified and is the protective layer around the seed (Johri & Konar 1956; Verkerke 1986). In many species the whole pericarp becomes dry and achene-like; however, in others the fruit is subdrupaceous with a thin fleshy layer or

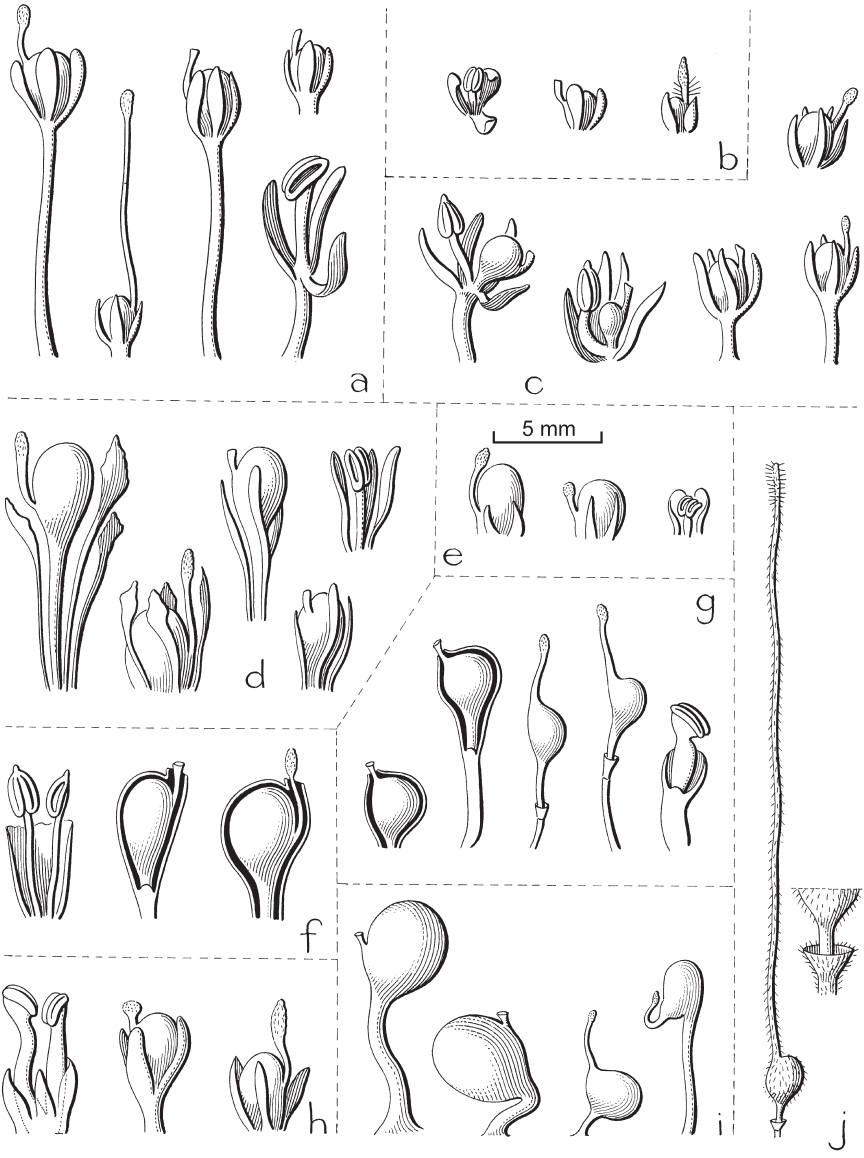

Fig. 20. Flowers of subg. *Sycidium* sect. *Sycidium* (a) and sect. *Palaeomorphe* (c), subg. *Sycomorus* sect. *Adenosperma* (d, e), sect. *Bosscheria* (b), subsect. *Neomorphe* (h), sect. *Papuasyce* (f), sect. *Sycocarpus* subsect. *Sycocarpus* (g, i) and subsect. *Macrostyla* (j). a. *F. conocephalifolia*, staminate flower, short- and long-styled flowers; b. *F. minahassae*, staminate flower, short- and long-styled flowers; c. *F. tinctoria*, staminate flowers with pistillodes, short- and long-styled flowers; d. *F. subcuneata*, staminate flower, short- and long-styled flowers; e. *F. adenosperma*, staminate flowers, short- and long-styled flowers; f. *F. itoana*, staminate flowers, short- and long-styled flowers; g. *F. schwarzii*, staminate flower, short- and long-styled flowers; h. *F. variegata*, staminate flowers, short- and long-styled flowers; i. *F. uncinata*, short- and long-styled flowers; j. *F. macrostyla*, long-styled flower and its perianth.

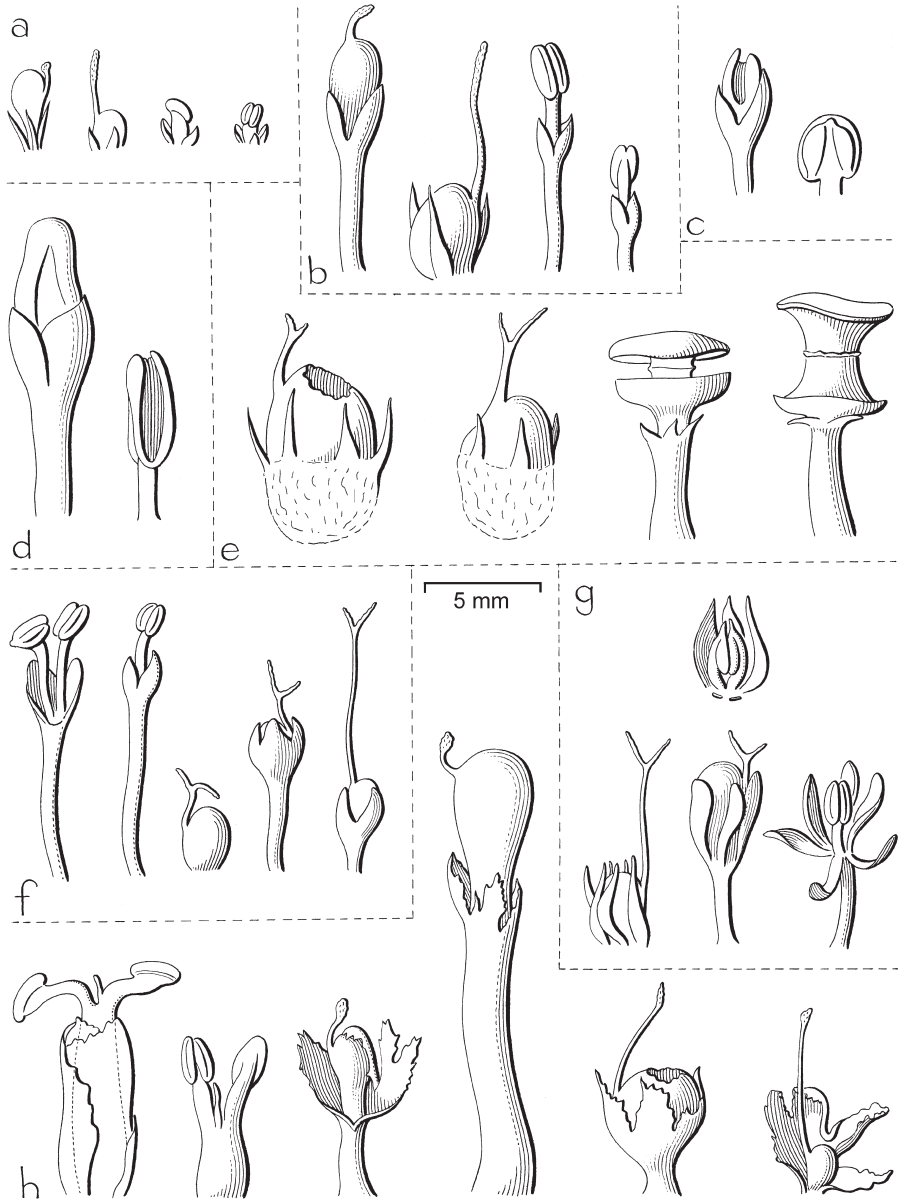

Fig. 21. Flowers of subg. *Urostigma* (a–e), subg. *Pharmacosycea* (f, g), and subg. *Sycomorus* subsect. *Sycomorus* (h). a. *F. virens*, short- and long-styled flowers, staminate flowers; b. *F. annulata*, short- and long-styled flowers, staminate flowers; c. *F. crassiramea* subsp. *crassiramea*, staminate flowers; d, e. *F. hesperidiiformis*, staminate flowers, pistillate flowers, basally embedded in the syconium wall, short-flower with opened 'gall-fruit', long-styled flower, staminate flowers with paltate anthers and circular dehiscence; f. *F. polyantha*, staminate flowers, short- and long-styled flowers; g. *F. callosa*, long- and short-styled flowers, staminate flowers; h. *F. racemosa*, staminate flowers subtended by bracteoles, stamens and pistillode, short- and long-styled flowers.

drupaceous with a thick fleshy layer. In the subdrupaceous fruit the other layer form mucilage in water which makes the layer viscid so that the fruit can be glued to surfaces of animals, etc. (Ramirez 1976). The layer is not or hardly affected by passage of the fruit through the digestive track of frugivores and it contains lipids, e.g. in *F. microcarpa* (Kaufmann et al. 1991). The contents make the layer attractive to ants (see p. 61) and appears to inhibit germination (see p. 61). In some groups the fruits are more or less clearly drupaceous. In the *F. montana*-group (subg. *Sycidium* sect. *Sycidium*) and the related African species there are dehiscent drupelets with a white exocarp, squeezing out (or expulsing?) the endocarp body, which is almost tetrahedral in shape and has a tuberculate surface (Fig. 22d). In some subsections of *Galoglychia*, the African section of subg. *Urostigma* also have dehiscent drupelets or fruits with a partly fleshy or mucilaginous outer layer showing clear morphological similarities to the characteristic Moraceous dehiscent drupe (Berg & Wiebes 1992: 29). The fleshy layer of the pericarp is whitish. One need to have fresh material to analyse the structure of the pericarp, in particular the presence of fleshy layers. The fruitlets as a whole are in herbarium material entirely or partly red to red-brown or whitish, differences that can play a role in distinguishing species. The pericarps of 'gall-fruits', in which the fig insects develop, become entirely dry and have a smooth surface. They are usually thinner than those of true fruits, so that (dark-coloured) insects are visible (see Verkerke 1986). Moreover, the shape of the 'gall-fruit' tend to be different, often obovoid rather than ovoid. In addition to true fruits and 'gall-fruits', one can find 'bladders', empty swollen ovaries in which wasps (or seeds) have not developed (Galil & Eisikowitch 1971) and/or abnormally developed 'fruits', often large and/or with unusual shapes, caused by gall-making insects (see Cook & Rasplus 2003). In the dioecious groups, the pericarps containing seeds vary in shape from compressed to subglobose, in outline from elliptic to subreniform to oblong. They are often keeled and/or tuberculate (Fig. 19, 22). Certain features of the fruits are more or less characteristic for certain subdivisions, such as the ± compressed and in outline elliptic to oblong fruits with a keel all around (Fig. 19d–f) for subg. *Synoecia*, those with a basal double keel (Fig. 19h, i) for sect. *Adenosperma* (of subg. *Sycomorus*), and those with a prominent pseudohilum (Fig. 22i) for subsect. *Sycocarpus* (of subg. *Sycomorus*). The fruits of the monoecious subgenera *Pharmacosycea* and *Urostigma* are either lenticular or somewhat oblongoid and plump. They show little or no variation in most subdivisions. However, the African sect. *Galoglychia* (of subg. *Urostigma*) shows a considerable variation (Berg & Wiebes 1992).The fruits varies in size from 0.5 to 5 mm in length. The style is usually caducous, but it is persistent in the fruit of *F. macrostyla* and *F. squamosa*. These styles have an unusual length and bear stiff retrorse hairs. Both species are rheophytes and it is likely that the fruit and style construction promotes attachment of the fruits to the substrate. The fruits of subsect. *Malvanthera* (subg. *Urostigma*) are mostly partly or entirely embedded in the wall of the syconium (see above).

Seeds — The embryo is either straight with cotyledons which are equal and flat or ± curved with a relatively long radicle and conduplicate cotyledons of which the smaller is partly enveloped by the larger one (Fig. 19, 22). The latter type is found in relatively large seeds (in relatively large fruits). The seeds contain endosperm, although in rather

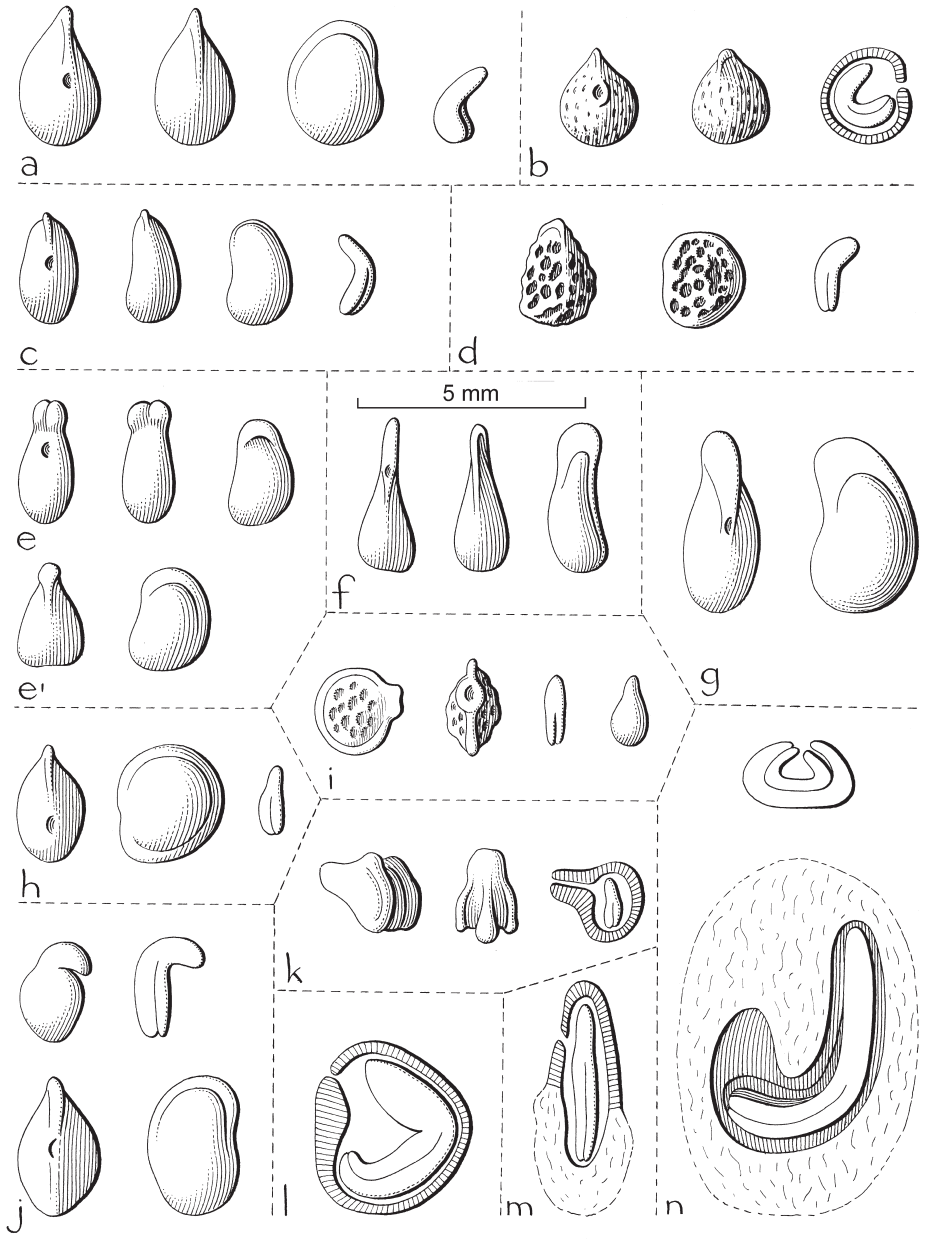

Fig. 22. Fruits (achenes or pyrenes) and embryos of subg. *Sycidium* sect. *Sycidium* (a, b, d) and sect. *Palaeomorphe* (c, e–g), subg. *Sycomorus* sect. *Papuana* (h) and sect. *Sycocarpus* (i, k), subg. *Pharmacosycea* (j), and subg. *Urostigma* subsect. *Conosycea* (l) and subsect. *Malvanthera* (m, n). a. *F. copiosa*; b. *F. cumingii*; c. *F. tinctoria*; d. *F. montana* (pyrene); e, e'. *F. virgata*; f. *F. armitii*; g. *F. heteropleura*; h. *F. itoana*; i. *F. septica*; j. *F. callosa*; k. *F. uncinata*; l. *F. crassiramea* subsp. *stupenda*; m. *F. rhizophoriphylla* (partly embedded in the wall of the syconium); n. *F. hesperidiiformis* (embedded in the wall of the syconium).

small amounts. Seeds can remain dormant for long periods, at least several years, in dry and cool (artificial) conditions.

Corner's appreciation — A wide range of characters of staminate and pistillate flowers as well as those of fruits have played an important role in the construction of Corner's classification and to some extent also the construction of keys. These characters are absent in part of the material because of the state of development or sex or they cannot be easily detected in herbarium specimens. Moreover, some of the flower or fruit characters are variable. These facts limit the usefulness of these characters as tools for identification.

Terminology — Some of the terms used by Corner are replaced: banyans by hemi-epiphytes, internal bristles by internal hairs, gall-flowers by short-styled pistillate flowers, female flowers by long-styled pistillate flowers. In Corner's descriptions the fruits (or endocarp bodies) are indicated as seeds, and the spot where the style was attached, the hilum, hence, seeds are substituted by fruits and the hilum by the pseudohilum. The terms (maintained) or used in the present treatment are:

1) 'gall-figs' for the functionally male syconia with the ovaries only used as breeding sites for fig insects and with a wall at maturity often less fleshy and usually coloured differently from the 'seed-figs', remaining green or with paler colours, generally less attractive to frugivorous animals;
2) 'seed-figs' for the functionally female syconia with the ovaries unsuitable as breeding sites for fig insects but which produce seeds; the wall becomes at maturity more fleshy and darker coloured than that of 'gall-figs' and is attractive for frugivorous animals;
3) 'gall-fruits' for the fruits developed from ovaries in which the insects develop and of which the pericarp develop differently (see above).

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POLLEN MORPHOLOGY

(J.M. Langeveld & R.W.J.M. van der Ham)

Pollen descriptions and illustrations of 45 out of the c. 735 *Ficus* species worldwide are available (literature cited by Thanikaimoni & Van der Ham 1999; e.g. Ramos Zamora 1977; Renault-Miskovsky & Petzold 1989; Roubik & Moreno 1991).

Pollen grains of *Ficus* are very small to small (7–22 μm), 2- or sometimes 3-porate and quite uniform. The shape of 2-porate grains is ellipsoid, often slightly asymmetrical, one side being more convex than the other, while that of 3-porate grains is triangular in polar view and oblate in equatorial view. Nearly all species have 2-porate pollen, many species (c. 50% according to the literature studied) have minor percentages of 3-porate pollen as well. *Ficus pseudosycomorus* (= *F. palmata*) is reported to have 3-porate pollen (Horowitz & Baum 1967). The pores are circular and vary in size from 1.0 to 2.5 μm.

The exine is thin, flexible, up to 1 μm thick and tectate. Mostly, the nexine and sexine are equally thick; sometimes the nexine is slightly thicker. The infratectum is granular with indistinct columellae. The ornamentation is psilate or slightly.

The pollination syndrome in *Ficus* is unique and highly specialized, though there is relatively little infrageneric variation (Berg & Wiebes 1992). This might explain the low pollen diversity in *Ficus*. The occurrence of two pollination mechanisms (active and passive pollen deposition by fig wasps) might imply the presence of two different pollen types within the genus. However, the investigations so far did not demonstrate significant differences (pers. comm. F. Kjellberg 2002).

Ficus pollen is different from that of most other Moraceae with regard to its small size and its smooth exine. Pollen of most Moraceae is at least 10 μm and scabrate, minutely echinate or granular. Moreover, the pollen of *Ficus* is ellipsoid or oblate whereas the pollen of other Moraceae often has a more spheroidal shape. *Ficus* pollen is usually 2-porate, but the number of pores in other Moraceae is often more than two. *Castilla*, the nearest relative of *Ficus* according to a molecular phylogenetic analysis (Sytsma et al. 2002), has suboblate, 3-porate (rarely 2-porate), aspidate pollen. *Maclura* has 2- or 3-, rarely 4- or 5-porate pollen and *Dorstenia* pollen does have six up to as many as 80 pores per pollen grain. *Brosimum* pollen, however, is consistently 2-porate. In contrast to *Ficus* pollen, the pores in most other Moraceae pollen are aspidate, operculate and/or annulate. The pore diameter in *Ficus* does not seem to differ from that in other Moraceae.

The slightly asymmetrical fossil *Ficus* pollen type can probably be consistently separated from diporate Ulmaceae or Urticaceae pollen (Muller 1981), but it is not clear if genuine *Ficus* pollen is represented in this type. The highly specialized pollination syndrome seems to preclude incorporation of *Ficus* pollen in sediments (Hamilton 1976). The *Ficus* type has been reported from the middle Eocene of Tennessee and the upper Miocene of Borneo and Spain (Muller 1981).

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POLLINATION

History — The history of the knowledge about pollination and the role of fig wasps moved from doubt about the role of fig wasps in fertilisation in *Ficus* as expressed in some classic studies by Cunningham (1889) and Treub (1902) to an increasing awareness of significance of these insects for fertilisation, at least in *F. carica* (see Condit 1947). The discovery of the presence of cavities in the thorax of female fig wasps as organs for pollen transport, almost simultaneously by Galil & Eisikowitch (1968) and Ramirez (1969) triggered a renewed interest in pollination in the genus expanding to other species than *F. carica* and to a wide range of topics being part of the fig-fig wasp mutualism or more or less clearly linked to it. Progress and trends of the research on this mutualism and related matters, such as co-evolution and co-speciation, are presented and summarized in e.g. Janzen (1979), Wiebes (1979), contributions in Experientia 45 (1989), Berg (1990), contributions in J. Biogeogr. 23 (4) (1996), and more recently in papers by Weiblen (2002), Cook & Rasplus (2003), and Jousselin et al. (2003b).

Outline — The mode of pollination in *Ficus* contains a number of unusual traits making it unique:

1) Pollination is carried out by small wasps not involved in any other group of Angiosperms.
2) Pollen is brought into the 'blossom' by one generation of pollinators but carried out by the next with an interval of some weeks or months.
3) This linked to an unusual long interval between female and male anthesis.
4) The insects bringing pollen mostly die in the inflorescence, which may be indicated as a 'tomb-blossom'.
5) The mode of pollination is based on seed-predation (or at least on the sacrifice of part of the potential seed-production), instead of breeding at the expense of dispensable tissues.
6) A mixture of passive pollen-transport by wind carrying the tiny insects and active transport by moving towards and into the figs.

7) Pollination is often ethodynamic (Galil 1973b); the pollen is actively stored in pollen-pockets and removed from them during oviposition.
8) The plant-pollinator relation is to a large extent species-specific.

Genera of pollinators — The pollinators belong to the Agaonidae (Chalcidoidea, Hymenoptera). There are 20 genera, of which 11 in the Malesian region (Wiebes 1994), seven confined in Africa and to subg. *Urostigma* sect. *Galoglychia* (Wiebes in Berg & Wiebes 1992) and two in America (Wiebes 1995). The genera of the Agaonidea are distributed over the genus *Ficus* as given in Table 2.

Features of agaonid fig wasps — These insects show strong sexual dimorphy (Fig. 23e, f). The females are winged and have elaborate antennae and well-developed eyes, but have usually weak mouth-parts. They carry the pollen. The males are wingless, have poorly developed antennae and eyes, but have strong mouth-parts. The pollinating

Table 2. *Ficus* sections and pollinator genera.

Stilpnophyllum	— Pleistodontes
Galochlychia	— Agaon, Alfonsiella, Allotriozoon, Courtella, Elisabethiella, Nigeriella, Paragaon[1]
Americana	— Pegoscapus
Urostigma	— Deilagaon, Eupristina (Eupristina and Parapristina), Platyscapa, Watersoniella[1]
Pharmacosycea	— Tetrapus
Oreosycea	— Dolichoris
Ficus	— Blastophaga (Blastophaga)
Eriosycea	— Blastophaga (Valisia)
Synoecia	— Wiebesia
Rhizocladus	— Wiebesia
Sycidium	— Kradibia
Palaeomorphe	— Liporrhopalum
Sycomorus	— Ceratosolen (Ceratosolen)
Hemicardia	— Ceratosolen (Ceratosolen)
Adenosperma	— Ceratosolen (Ceratosolen)
Bosscheria	— Ceratosolen (Ceratosolen)
Dammaropsis	— Ceratosolen (Strepitus)
Papuasyce	— Ceratosolen (Strepitus)
Sycocarpus	— Ceratosolen (Rothropus)[2]
Exceptions recorded (Wiebes 1994)[3]:	
Ficus montana	— Liporrhopalum
Ficus asperiuscula and *F. complexa*	— Ceratosolen (Ceratosolen)
Ficus primaria	— Wiebesia
Ficus pritchardii	— Ceratosolen (Ceratosolen)

1) The pollinator genera are in sect. *Galoglychia* and sect. *Urostigma* more ore less clearly associated with subsections or even confined to them, such as *Platyscapa* to subsect. *Urostigma*.
2) According to Jousselin et al. (2003) species of subsect. *Frutescentiae*, at least *F. deltoidea* and *F. erecta*, are pollinated by *Wiebesia* wasps.
3) The pollinators for subsect. *Macrostyla* are unknown.

wasps are 1–3(–4) mm long and blackish or yellowish. The majority of the pollinating fig wasps have a pair of pockets in the ventral part of the thorax to store pollen. The insects are designed to enter the figs through stiff interlocking ostiolar bracts, constructed such to keep insects (others than pollinating wasps) out. The number of eggs a wasp can lay varies from 100 to 400, depending on the size of the insect, which is usually related to the size of the syconia with which they are associated (cf. Berg 1990). The fertilized eggs produce female insects and the others male insects (as usual in Hymenoptera). The ratios male to female insects reared in syconia varies considerably, roughly from 0.1 to

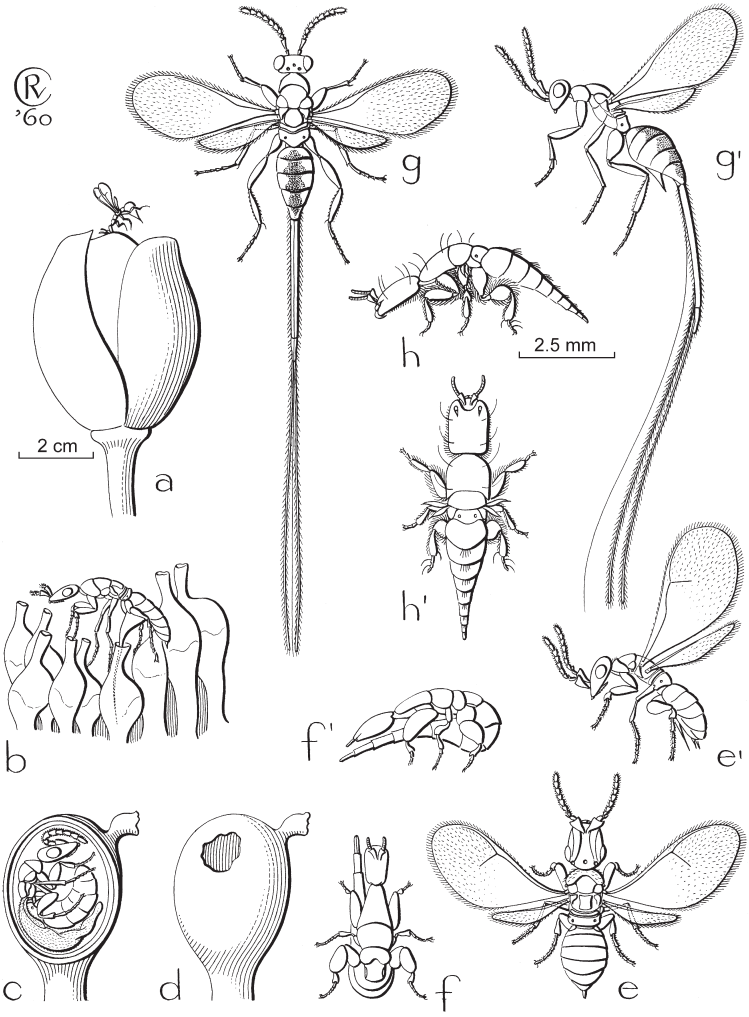

Fig. 23. Fig wasps. — a. *Pleistodontes frogatti* Mayr (pollinator) entering a fig of *F. macrophylla* (after Pemberton 1921). — b. *Ceratosolen notus* Baker ovipositing in short-styled ovaries of *F. nota* (after Williamson 1928). — c. *Ceratosolen solmsii* Mayr (pollinator) in 'gall-fruit' of *F. hispida*; d. the 'gall-fruit' opened; e, e'. female; f, f'. male. — *Phylotrypesis pilosa* Mayr, non-pollinating wasp with external oviposition, g, g'. female; h, h'. male.

0.4, partly defined by taxa and easily affected by unusual conditions (cf. Berg 1990). The number of pollen grains that can be carried in pollen pockets is, e.g., c. 1000 for *F. religiosa* (Galil & Snitzer-Pasternak 1970) and in *F. sycomorus* 2000–3000 (Galil & Eisikowitch 1968). The life span of female wasps is short, up to some days in nature (Abdurahiman & Joseph 1976; Kjellberg et al. 1988).

It is likely that the majority of the species of *Ficus* have one species of Agaonid wasps as pollinator. However, an increasing number of *Ficus* species are known to have more than one Agaonidae species as pollinators (Rasplus 1986; Cook & Rasplus 2003). There are also some cases that the same pollinator species is found in more than one *Ficus* species (Berg & Wiebes 1992: 206, 214, 215; Cook & Rasplus 2003). The males of *Ceratosolen* species show mostly respiratory adaptations because of the (usual) presence of liquid in syconia of subg. *Sycomorus* species (Compton & McLaren 1989); in particular the African species have greatly enlarged peritremata, those associated with species of sect. *Sycomorus* in New Guinea have the least developed ones (pers. comm. J.-Y. Rasplus). Moreover, these insects (often) cut off anthers, which can be found scattered in the syconium (Galil 1973a).

In one case, an Agaonid wasp, *Ceratosolen galili*, has lost the capacity to pollinate, but still breed in figs, a so-called cuckoo (Galil & Eisikowitch 1969; Berg & Wiebes 1992; Kjellberg et al. 2001).

Developmental phases of syconia — In connection with pollination five phases in the development of the syconia have been distinguished (Galil & Eisikowitch 1968). The development until receptiveness of the stigmas, the pre-female phase (A). It is succeeded by the female phase (B), normally a period of 3–6 days, but it is extended if pollination does not take place (Michaloud et al. 1985); in this period the stigmas are receptive and attractants emitted, the syconia entered by the pollinators which oviposit and deposit pollen. The interfloral phase (C): a period of some weeks (2–6) or months (2–4), and rather constant for species, but which can be affected by climatical conditions (as low temperatures and drought); in this phase the insects develop and the seeds ripen. In the male phase (D), a period of some days, the anthers are open, copulation of the insects take place, and the female insects become (actively or passively) loaded with pollen, and leave the syconia. In the post floral phase (E) the wall of the syconium changes, become coloured, looses latex, and become softer, and in this way attractive for frugivorous animals.

Course of events — The procedures of pollination can be described for pollinator species with pollen pockets in the thorax in monoecious fig species in general as follows. The female wasps, attracted to figs with receptive stigmas by emitted (specific) volatile chemical compounds (Bronstein 1987; Ware et al. 1993; Hossaert-McKey et al. 1994; Gibernau et al. 1997; Gibernau & Hossaert-McKey 1998; Grison et al. 1999; Grison-Pigé et al. 2001; Song et al. 2001), enter the fig through the ostiole (Fig. 23a). On the way to the interior of the fig they loose their wings and often also parts of the antennae. When inside they start to oviposit, probing the styles and depositing eggs in the ovules (Fig. 23b). They do oviposite more often in short-styled flowers than in long-styled ones. While ovipositing they remove pollen grains from the pollen pockets and deposit then on the stigmas (often coherent or also cohesive and forming a synstigma). This

(synstigmatic) layer of stigmas functions as the 'working platform' of the ovipositing wasp. The synstigma allows pollen-tubes to grow into style of neighbouring flowers. The founding female insects die and their larvae develop, feeding in seed tissues (developing through fertilisation and/or by induction by fluid released during oviposition?). The ovules not invested by eggs, thus in general of the long-styled flowers develop into seeds. After some weeks or months the seeds are ripe and the insects fully developed. The male insects bite holes in the pericarp of the 'gall-fruit' and move into fig cavity where they start to open pericarps containing female insects (Fig. 23d). Through the hole made, they copulate with the female insect. Copulation with still enclosed females ensures that eggs of all females can be fertilized. After copulation, the females also move around in the fig cavity. They start to load their pollen sacks with pollen. After copulation activities have ceased, the males start to make one (or more) tunnels in the wall of the fig, often through or near the ostiole. The male insects die soon after the females have left. The females can leave the syconia undamaged. After the females have left the fig, the wall becomes softer and often coloured, the milk sap disappears, and the figs become attractive to fruit-eating animals. This ripening process is accelerated by the production of ethylene induced by damage caused by the making of tunnel(s). The tunnels are often made through the ostiole or just beside the ostiole, less commonly elsewhere in the fig wall. After the females have left the figs they have to arrive at a fig with receptive stigmata. As the insects are so small, it is likely that they are moved by wind instead of by flying. That activity will be essential when the insects have arrived near suitable oviposition sites.

In dioecious species, the procedures as described above and for *F. fistulosa* by Galil (1973a) take place in the figs with short-styles and staminate flowers. All ovaries can in principle be occupied by eggs. The postfloral phase is obsolete. In the figs with long-styled flowers the pollinators enter and try to deposit eggs, but fail as their ovipositors are too short to reach the ovules; the ovipositors of wasps involved in pollination of functionally dioecious groups are shorter than of those associated with monoecious groups (Ramirez 1980; Wiebes 1994; Weiblen 2001).

Special cavities to transport pollen have not developed in all groups of wasps or they have become rudimentary. Such wasps perform topocentric (Galil 1973b). They become dusted by pollen. The pollen grains become stored in slits of their body (abdomen) as described for the pollinator of *F. erecta* (Okamoto & Tashiro 1981). The abdomen is ± swollen due to the humidity inside the fig, but it shrinks outside. Other parts for pollen storage are setae and articulations (pers. comm. J.-Y. Rasplus). In the figs where they oviposit the body swells again and pollen grains are released from the slits. This way of pollination implies that pollen is deposited at random on the stigmata. In some cases, e.g., in Pleistodontes, the pollen pockets can be present but the pollination is passive as the pollen pockets are regressing and of no use for pollen storage (Lopez-Vaamonde et al. 2002). *Ficus* species with passive pollination have much higher anther-to-ovule ratios (Kjellberg et al. 2001). Passive pollination is found in about one third of the *Ficus* species, for the greater part members of the neotropical section *Pharmacosycea* and in the subgenera *Ficus* and *Synoecia* and scattered in the *Urostigma* sections *Urostigma* and *Stilpnophyllum* (Kjellberg et al. 2001; Jousselin et al. 2003) as well as in sect. *Oreosycea* (pers. comm. F. Kjellberg). The more common ethodynamic or active pollination

involves precise deposition of pollen at spots where oviposition takes place; thus, a quite effective use of pollen carried. In the *Ficus* species with active pollination the thecae usually do not open widely and the anther-to-ovule ratios are significantly lower than in species with passive pollination (see below; Kjellberg et al. 2001). Wasp species involved in active pollination have coxal combs. Tunnels are not made in (groups of) species, in which the ostiole is wide and the ostiolar bracts become so loose at the male phase of the development of the syconium that the female wasps can emerge without being damaged (see p. 38).There are apparently mechanisms (by damaged bracts and coagulated milk sap or by chemical signals?) regulating the entry of the pollinators in figs which ensure that all or most figs get sufficient, but not an excess of pollinators (Müller 1886; Berg 1990); small figs have mostly one pollinator, sufficient to pollinate all flowers and occupy available breeding sites, larger figs normally give access to more than one pollinator.

Development of endosperm — It is likely that in monoecious species, the development of endosperm of ovules of both long- and short-styled flowers is initiated by (double) fertilisation and the endosperm is consumed by insect larvae, if present. Normal endosperm development also occurs in long-styled flowers of dioecious species. Data provided by Johri & Konar (1956) and by Verkerke (1987) indicate that fertilisation triggers the development of an embryo, which soon ceases to develop further (due to the presence of an egg), and that of endosperm in short-styled flowers (also of dioecious species). It is not quite clear whether presence of an egg ensures further development of endosperm. According to Cook & Rasplus (2003) Agaonidae should be regarded as gall inducers, implying that the proliferation of tissue (endosperm) on which the fig wasp larvae feed is induced by oviposition, i.e. by fluid released; it would dissociate reproduction of the wasps and its efforts to collect, transport and deposit pollen, at least in cases of active pollination. It is seed predation that seems to explain the development of the syconium and its peculiar features as well as the development of dioecism and morphology and behaviour of Agaonidae, in particular in connection with active pollination, all contributing to the intricate pollination system. However, some experiments show that Agaonidae can breed more or less successfully in ovaries without pollination, and then the larvae are apparently feeding on proliferated nucellus tissue (Galil & Eisikowitch 1971; Jousselin et al. 2003a). The conclusion by Jousselin & Kjellberg (2001) that fertilized ovules in which the development of embryo and endosperm has been initiated may provide a better feeding substrate for the developing larvae, seems to bring into harmony seemingly contradictory findings and opinions.

Other animals — Many (groups of) animals make use of the pollination system and/or traits of the syconium. The most important among them are non-pollinating chalcidoid (fig) wasps (see Berg & Wiebes 1992; Weiblen 2002; Cook & Rasplus 2003). Several categories of non-pollinating fig wasps can be recognized, as gall-making wasps that oviposit from outside with long ovipositors (Fig. 23g, h), gall-making wasps that enter syconia like true pollinating wasps do, and parasitic wasps ovipositing from outside through the receptacle with long ovipositors and of which the larvae feeds on other larvae. Most of these insects have negative effect on the pollination system and mutualism, but those entering the fig to oviposit may carry pollen and may play a role in

pollination to some extent (Müller 1886; Jousselin et al. 2001; Cook & Rasplus 2003). The larvae of the gall-making wasps feed on proliferated nucellus tissue. The number of non-pollinating wasp species that can be found in certain *Ficus* species, can even be more than 30 (Chen et al. 1999; Cook & Rasplus 2003); e.g., in the African *F. bubu* Warb. 34 species (pers. comm. J.-Y. Rasplus). The numbers are higher in monoecious than in dioecious fig species (Kerdelhué & Rasplus 1996). Many of such wasps are more or less tightly associated with certain subdivisions and species of *Ficus* and form communities (Kerdelhué et al. 2000). Nematodes are common inhabitants of syconia (Martin et al. 1973); they are brought from one fig to another by fig wasps, which may also carry other organisms, e.g. mites.

Ants can often be found patrolling on syconia to catch emerging female wasps and dead or dying male wasps (also inside the inflorescence); also beetles, centipedes, and mites can be found to do the same (Müller 1886). Ants may be keeping homoptera on the fig and incidentally protect the pollination system as described for the African *F. sur* Forssk. (subg. *Sycomorus*) by Compton & Robertson (1988).

For large trees with numerous figs the liberation of the female wasps is an event that can be detected from great distance by the presence of flocks of insect-catching birds, as swallows, above the trees.

The biology of African species of the drosophilid genus *Lissocephala* is tied to syconia (Lachaise 1982; Harry et al. 1996). Other organisms that can be found in figs or in their walls are larvae of beetles of lepidoptera, protozoans, and yeasts (Müller 1886; Phaff & Miller 1961; Baijnath & Ramcharun 1983).

Abortion — If there is no tissue development due to fertilisation or oviposition, the syconia abort sooner or later, often preceded by a change of colour.

Phenology — As the lifetime of female fig wasps is only a few days, these animals have to find in that short period a site to lay eggs. To keep the reproduction of the wasps and the pollination system functioning, figs in the female phase should be present the year round. Some types of phenology can be distinguished (Berg 1990). In the two subgenera with only monoecious species, *Pharmacosycea* and *Urostigma*, this is realized by synchronous fig production on individuals but asynchronous in populations (see Bronstein et al. 1990). Each individual has its own rhythm of fig production. Aberrations as the presence of some figs out of normal individual flowering and seasonal fluctuations in fig production are not unusual. In the species of these two subgenera production of seed and pollinators are tightly linked in time (and space). It implies that part of the seed production may happen in periods not optimally favourable for germination and settlement. It also implies that (geitonogamous) self-pollination is (almost) excluded, as on the same tree anthesis of pistillate and staminate flowers are separated in time. In subg. *Sycomorus*, however, there is a tendency towards continuous fig production, implying that the different phases of fig development can be found on the same tree or the same population (e.g. Baijnath & Ramcharun 1983; Cortlett 1987). If figs in various phases of development occur in monoecious species of this group, then (geitonogamous) selfing may occur; there can be seasonal fluctuations in fig production or transition to separate subsequent fig crops in this group. Artifical self-fertilisation may yield viable seeds (Ramirez 1986).

In the dioecious groups of species only the production of figs with short-styled pistillate (and staminate) flowers has to comply with the need of continuous presence of breeding sites. In this group production of pollinators and of seeds are disconnected and the production of figs with long-styled and short-styled flowers do not need to be synchronous and often is not so, as e.g. *F. carica* having three crops of 'gall-figs' (in southern France, there can be more elsewhere) and only one of 'seed-figs' per year; in *F. exasperata* in India, it can be six crops of 'gall-figs' and only one crop of 'seed-figs' a year (Balakrishnan Nair & Abdurahiman 1984) or by a single crop of 'seed-figs' and out of season 'gall-fig' production (Patel & Hossaert-McKey 2000).

In the slow-growing species *F. deltoidea* and *F. oleifolia* the figs are successively and in different phases of development on the leafy twigs. The way these species produce the figs can be related to occurrence in nutrition-poor habitats.

Hybridisation — Material that could be regarded as hybrids with a clear mixture of parental characters have not been encountered. The few specimens showing (one or two) characteristic features of co-occurring species might be products of hybridisation. *Ficus* species can hybridize, as has been demonstrated by an artificial one between *F. carica* and *F. pumila* (see Condit 1969, also for a few other cases). It is known that fig wasps may enter figs of 'wrong' species (Ramirez 1970; Compton 1990). The cases described by Ramirez did not yield viable seed, and the one by Compton did yield seed that germinated, but did not develop beyond the cotyledon-state (see Berg & Wiebes 1992). However, artificial pollination yielded a viable offspring of two closely related species of the American section *Pharmacosycea* (Ramirez 1986). Evidence for the occurrence of first and later generation hybrids in *Ficus* populations in the Krakatau Islands has been provided (Parish et al. 2003).

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DISPERSAL

The majority of the *Ficus* species are dispersed by animals. The ripe figs are mostly eaten at the spot; small figs are swallowed and the fruits (or pyrenes) pass the digestive tracts and are released in the droppings. Monkeys and squirrels have the tendency to eat a bit of a fig and drop most of it. Squirrels and fruit bats may carry figs to other places to eat them there. Endo-zoochory and dys-zoochory (the diaspores are eaten and digested) are the most common mode of the dispersal of seeds of *Ficus*. Exo-zoochorous dispersal happens when only the fruitlets are eaten from the syconia, as by pigeons. The fruitlets may stick to the bill and be brushed off to branches. Water plays a role in dispersal by transporting floating figs. The African *F. cyathistipula* is adapted to this mode of transport by a thick spongy wall of the syconium. For *F. macrostyla* and *F. squamosa* the single fruitlets are probably essential entities of dispersal. In these rheophytic species the very long styles are persistent. These styles have short and stiff retrorse hairs which will contribute to attachment to the substrate.

The colour of ripe figs vary from green to yellow to orange to red to purple or blackish. A more extensive and detailed overview was presented by Shanahan et al. (2001) in a global review of fig-eating vertebrate frugivores. It treats the groups of animals involved (birds, arboreal and terrestrial mammals, reptiles and fishes), their effectiveness as seed-dispersers, syndromes mainly based on dimension and colour of the syconia and their position on the tree (or height in the vegetation) and groups of animals associated with them, and figs as keystone resources (see also Lambert & Marshall 1991; Kinnaird et al. 1999). However, the importance of *Ficus* is not everywhere in the humid tropics the same (see Gautier-Hion & Michaloud 1989). Six dispersal guilds mainly determined by vertical stratification were recognized in *Ficus* in lowland rain forest in northern Borneo by Shanahan & Compton (2001).

Ants play a role in further dispersal of fruits deposited, e.g. on branches, as in droppings of animals. In this two-phase dispersal mechanism the ants are attracted by the

lipid containing viscid outer layer of fruits and may carry the fruits to sites more suitable for germination and establishment (Kaufmann et al. 1991). On the other hand, ants harvesting fig fruits in the forest canopy and eating them, have negative effects upon frequency of establishment (Laman 1994). The traits of the fruits and seeds of *Ficus* allow long-distance dispersal. Events of long-distance dispersal will probably rarely result in reproduction and establishment by absence of pollinators and populations of trees to allow establishment of the pollinators as well.

Germination — The germination is epigeal (see Johri & Konar 1956; Verkerke 1988). The first normal leaves are opposite. Germination of all or most *Urostigma* species requires light (Bessey 1908; Galil & Meiri 1981; Laman 1994; Michaloud & Michaloud-Pelletier 1987), most obviously so the hemi-epiphytic species. However, there are differences with regard to this requirement, as there are hemi-epiphytic species which establish lower (or higher) than the normal height of 20–25 m in the canopy of high forest (Laman 1994). Hemi-epiphytes of sect. *Palaeomorphe* (subg. *Sycidium*) germinate and establish close to (up to some meters) the forest floor. Humidity conditions are also important for germination (Galil & Meiri 1981; Laman 1994; Michaloud & Michaloud-Pelletier 1987), and for hemi-epiphytic species linked to favourable sites like knotholes (Laman 1994) and presence of epiphytes (Michaloud & Michaloud-Pelletier 1987). Passage of fruits through the digestive tract of birds may have a positive effect in speeding up germination of *Ficus* seeds (Midya & Brahmachary 1991) and the mucilaginous exocarp may inhibit germination (Ramirez 1976). Data about germination of seeds of terrestrial *Ficus* species could not be traced; many of them will germinate under dark forest floor conditions.

The physiology of germination and the variation within the genus, such as in relation to features of the pericarp and to the life-form, is an underexplored field.

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CLASSIFICATION

History — The only monograph of *Ficus* is Miquel's (1867). It is based on his Prodromus (1847–1848), where he distinguished several genera on floral details, as Gasparrini had just indicated (1844, 1845). As species were added, the distinctions diminished and the practical difficulty arose when sterile material, needing identification, could not be assigned to the genera. In 1867, therefore, Miquel submerged them into one genus, as subgenera or sections to accommodate 472 species recognized; this treatment has persisted. In his revision of the Asian and Malesian species, King (1887–1888) introduced two new sections (*Palaeomorphe* and *Neomorphe*), but retained most of Miquel's subgenera and sections. He was concerned chiefly with the reduction of species and he limited his appreciation of the unsatisfactory state of the sectional classification by citing numerous exceptions.

Mildbraed & Burret (1911) were concerned with African species, most of which belong to one group, called by them subg. *Bibracteatae* (= subg. *Urostigma* sect. *Galoglychia*). The value of this taxon could not be estimated while the Asian and Australasian complement was still lumped into another group of *Urostigma*.

Elmer (1937) planned a superficial treatment of the Philippine species which was partly taken up and validated by Sata (1944). Sata introduced many new infrageneric names, but his standpoint was, indeed, too insular, and many antedating names coined by Endlicher (1850) and Miquel were overlooked.

Diels (1935) endeavoured to accommodate the New Guinea species into King's classification, but he failed largely to follow Miquel's advice on floral construction and he missed the keys to the revision of the genus which rich discoveries from Borneo to the Solomon Islands, New Caledonia, and Queensland necessitated.

Miquel's advice on floral construction was followed by Corner, who undertook the tremendous task to revise the genus for an extensive area with a proliferation of names and many new discoveries. He did not only pay careful attention to floral construction, but also to characters of the fruit or pyrene (by Corner consequently indicated as seed) and anatomical details, as pioneered by Renner (1907). This resulted in a classification with nearly 125 infrageneric entities, subgenera to subseries, for the Asian-Australasian region (Corner 1965: 3–6). The subdivision was into a group of monoecious species, comprising three subgenera, *Pharmacosycea* (with 2 sections world-wide: *Oreosycea* and *Pharmacosycea*), *Sycomorus*, and *Urostigma* (with 7 sections world-wide; *Americana*, *Conosycea*, *Galoglychia*, *Leucogyne*, *Malvanthera*, *Stilpnophyllum*, and *Urostigma*), and a group of dioecious species, all Palaeotropical and accommodated in subg. *Ficus*, which was subdivided into 8 sections: *Adenosperma*, *Ficus*, *Kalosyce*, *Neomorphe*, *Rhizocladus*, *Sinosycidium*, *Sycidium*, and *Sycocarpus*.

Berg (1986) proposed the subdivision of the African section *Galoglychia* into 6 subsections and Carvajal & K.-Shabes (1998) of the American section *Pharmacosycea* into 2 subsections. A revision of the subdivision of the sect. *Americana* proposed by Miquel (1867) is in preparation (Berg in Berg & Villavicencio 2004).

The focus in Corner's work on details distracted to some extent attention from macro-morphological characters of vegetative parts. This affected the construction of keys and the classification. That classification was questioned by Ramirez (1977) who

suggested changes to get it more in accordance with pollinating fig wasp classification. Taxonomic studies on African *Ficus* species also raised questions and suggestions for changes in Corner's classification (Berg 1989a, 1989b, 1998).

Revised classification — The current study on Malesian species created a possibility to check more closely upon Corner's classification. This led to the currently proposed classification of the genus. It is primarily based on morphological criteria and takes into account various comments by Corner (1960, 1967) on the classification he proposed. He suggested to consider a separate subgenus combining the sections *Kalosyce* and *Rhizocladus* (1960) and to include the sections *Adenosperma*, *Neomorphe*, and *Sycocarpus*, but also the series *Prostratae* and *Pungentes* (of sect. *Sycidium*) in subgenus *Sycomorus*, if unifying characters could be found (1967).

The currently adopted classification, outlined by Berg (2003) comprises 6 subgenera: Two with only monoecious species: *Pharmacosycea* (with the sections *Oreosycea* and *Pharmacosycea*) and *Urostigma* (with the sections: *Americana*, *Galoglychia*, *Stilpnophyllum*, and *Urostigma*), *Sycomorus* (with dioecious and monoecious species and with the sections *Adenosperma*, *Bosscheria*, *Dammaropsis*, *Hemicardia*, *Papuasyce*, *Sycocarpus*, and *Sycomorus*), and three subgenera with only dioecious species: *Ficus* (with the sections: *Eriosycea* and *Ficus*), *Sycidium* (with the sections *Palaeomorphe* and *Sycidium*), and *Synoecia* (with the sections *Kissosycea* and *Rhizocladus*). Most of the sections comprise subsections, but the ranks of series and subseries are not applied, but instead informal groups of presumably related species indicated. The subgenera and most of the sections can be recognized on the basis of characters of vegetative parts and of the exterior of the fig. Three pairs of subgenera can be distinguished not only on the basis of morphological similarities but also of distribution patterns (Berg 2003): *Pharmacosycea* and *Urostigma*, *Ficus* and *Synoecia*, and *Sycidium* and *Sycomorus*.

This new classification also makes distribution patterns more transparent, and still support Corner's grand visions regarding evolution and biology of the genus. The proposed classification is at least at level of subgenera, but also at the levels of sections and/or subsections largely in accordance with the taxonomy of the group of pollination fig wasps (Agaonidae). There are only few cases in which the wasp genus does not match the subgenus or section of *Ficus*. Moreover, analyses partly based on a molecular study by Weiblen (2000) largely supports this classification which is exclusively based on morphological criteria. A more recent molecular phylogeny (Jousselin et al. 2003) shed some doubt about the solidity of this classification. It disconnects species of subsection *Urostigma* from the rest of the subgenus and merge species of the subgenera *Ficus*, *Sycidium*, and *Synoecia* in the same cluster. All molecular studies, including that by Herre et al. (1996) indicate an isolated position of the neotropical section *Pharmacosycea*, as the sister-group of the rest of the genus.

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USES

Formerly, in primitive societies, wild fig-plants had many uses and they have inherited many vernacular names: to modern man, the genus supplies the edible fig *F. carica*, a variety of ornamental plants, in the tropics and subtropics outdoors, in gardens, parks, and along avenues, and in colder parts of the world indoors. The Asian *F. benjamina*, *F. elastica*, and *F. microcarpa* are commercially the most valued species.

Religion — One of the most ancient attributes is the reverence for 'banyans' held by the peoples of Asia. It has been referred to the spread of Hinduism and Buddhism, centred on *F. religiosa* as the 'tree of life' under which Buddha received spiritual enlightenment and *F. benghalensis* around which Hinduism arose. By transference of superstition, *F. benjamina* may have become the inspirited 'banyan' of the Malays. According to the Iban in Borneo, that 'banyan' may not be climbed but can be cut down; its spirit is not killed but squats on the ground like maias (orang-utan) and whines like a dog in the night; it is transparent and has a head with one eye. This story may be a local adaptation

of the long and mysterious cult of the 'banyan'. Erudite accounts are given by Emeneau (1949) and Viennot (1954). The effect, even nowadays, is the survival of 'banyans' in the landscape where the wood-cutter has removed everything else. Several fig species are found as temple trees in Asia. The link to religion is also known from other parts of the world as in Africa where individual fig trees or groups of fig trees (as around rocks) are regarded as sacred, being the dwelling-places of spirits. Illustrations and models of gardens prove that *F. sycomorus* was in cultivation in Egypt already more than 4000 years ago; the species had its own goddess Hator. It was regarded as the tree of life and its wood was used to make the inner coffin of the sarcophagus. The biblical history tells that Adam and Eve used leaves of the fig-tree to make skirts. According to ancient tradition the tree of knowledge was a fig-tree.

Plant parts — None of the plant parts, except for the ripe figs of *F. carica* have commercial value now-a-days.

Many species are reported to produce light-weight to medium-weight hard wood (Boer & Sosef 1998). The majority of the species listed belong to groups that can form tall terrestrial trees, sect. *Adenosperma*, sect. *Oreosycea*, sect. *Sycidium*, and sect. *Sycomorus*. However, a number of hemi-epiphytic species are included in the list; it is not clear whether the timber is obtained from the secondary root-stem or from main branches.

The fibres of the inner bark of many species are (still) used for the preparation of string, rope, clothing, and matting (Brink et al. 2003). Specific differences are recognized and experts select better kinds for bow-strings. The extraction of fibre is described by Fox (1952)

Fig-latex is used for rubber, as that of *F. elastica* (Indian Rubber Tree), which was planted before the advent of *Hevea* (Tawan 2000). The latex is too resinous, but still finds sundry local purposes like for bird-lime. Latex is also used medicinally to cover and cure wounds and sores (Rojo et al. 1999). Sap of *F. tinctoria* was used to prepare a red dye (Florence 1997).

Native medicine is extracted from various plant parts and applied against various diseases (Rojo et al. 1999). Latex of some species is both in tropical America and Asia used as anthelminthic, and has now been proved therapeutically (Thomen 1939). The property of destroying round-worms and, in some instances, hook-worms is connected with the presence of the proteolytic enzym ficin, which has been shown to occur among Asian species in *F. carica* and *F. ulmifolia*; the enzyme, however, is more or less injurious to the intestine.

Young leaves and shoots of many are cooked or eaten raw (Van den Bergh 1993). Leaves of some species are eaten raw, as salad. Rough leaves, called *ampelas* and *wassa* are used as sandpaper. Some, as those of *F. tinctoria*, can be smoked as tobacco. Leaves of some species are used as cattle fodder.

The ripe figs of most species are edible, but very few are worth eating such as *F. elmeri* and *F. semicordata*, but none is so delicious as *F. carica*. Most are insipid, even those of the large *F. auriculata*. Most of the geocarpic figs are said to be palatable when ripe, but they are often covered with irritating hairs. The figs, as well as the leaves of *F. tinctoria* are recorded as the poor man's food or famine food.

The figs of the common *F. hispida*, however, are emetic and, in quantity, cause intestinal irritation which may lead to death.

Vernacular names — The Malay name for a 'strangling' fig is *ara*, *kara* or *ki-ara*. It may cognate with the Tamil *alu*. In Melanesia and Polynesia it becomes *aou* or *au*. In Java *bunut* or *bunoh* and *karèt* (rubber in Malay) are also used, in Malay *jerei*, and in the Philippines their name is *balete*. *Ara* may be combined with various adjectives to indicate other kinds of fig-plants*: trhus ara kêlêpong* or *kêlumpong* are cauliflorous species. Those with rough leaves are called *ampelas* or *wassa*, the second name being more frequent in eastern Malesia. Dusun names (W Borneo) are *tandiran* or *nunok* for 'stranglers' and *giwith* or *bêrungau* for 'geocarpic' figs. In Borneo, Celebes, and the Philippines, *nunok* is used for various fig-plants and the name extends with variations as *nunu* and *nanok* to Fiji. Similarly the Malay name *nasi-nasi* or *nenasi* referring to quantities of small figs like grains of rice, extends to Polynesia with variants as *masi-masi* and *memasi*. *Entomau* is the Iban name for 'geogarpic' figs, so abundant in Borneo. Ridley has recorded *sipudek* or *sipadik* for climbing figs of Malaya, but they are doubtfully for general use. Java, Celebes, and New Guinea to the Solomon Islands are particularly rich in vernacular names; in New Guinea it seems that hardly two tribes use the same names.

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Field characters — The well-developed stipules forming a conical cover at the tip of twigs and leaving circular scars are common in *Ficus*. The presence of latex distinguishes the genus from representatives of other families in which circular scars are found, such as Dipterocarpaceae p.p., Magnoliaceae, and Theaceae. Moreover, the genus can usually be recognized by the presence of waxy glandular spots on the lamina beneath and on the base of the midrib, the axils of the basal lateral veins, in the axils of lateral veins in the middle of the lamina, and/or other furcations of the venation. Finally, many species have triplinerved or subtriplinerved venation.

SPOT CHARACTERS OF INDIGENOUS MALESIAN SPECIES

Habit

Plants (usually/mostly/potentially) hemi-epiphytic: species of subg. *Urostigma* (all species), subg. *Sycidium* sect. *Palaeomorphe*: *F. tinctoria*-group and *F. subulata*-group (p.p.).

Plants root-climbers: subg. *Synoecia* (all species).

Plants (often) climbers otherwise: subg. *Sycidium* sect. *Palaeomorphe*: *F. subulata*-group, p.p.); *F. depressa*, *F. globosa, F. lawesii*, *F. microsyce*, *F. oleifolia*, *F. paracamptophylla*, *F. sumatrana*.

Plants (obligatory/facultatively) rheophytic: *F. arbuscula*, *F. ischnopoda*, *F. ixoroides*, *F. limosa*, *F. macrostyla*, *F. rivularis*, *F. pustulata*, *F. subtrinervia*, *F. trichocerasa*.

Plants (facultatively) holo-epiphytic: *F. deltoidea, F. oleifolia*.

Plants often becoming trees > 30 m: subg. *Urostigma* (several, most frequently in sect. *Stilpnophyllum*), subg. *Pharmacosycea* (several), subg. *Sycomorus* subsect. *Neomorphe* (some); sometimes in subg. *Ficus* (*F. lamponga*) and subg. *Sycidium* (*F. melinocarpa* and *F. stellaris*).

Plants (always/mostly) shrubs < 1.5 m: subg. *Ficus* subsect. *Frutescentiae* (many, in Malesia, *F. ischnopoda*), subg. *Sycidium* (*F. eustephana*, *F. sandanakana*, *F. stipata*, *F. subsidens*), subg. *Sycomorus* (*F. cryptosyce*, *F. suffruticosa*, *F. macrostyla*).

Plants (usually) ramiflorous: subg. *Urostigma* subsect. *Urostigma* p.p.; subg. *Synoecia* subsect. *Punctuliifoliae* p.p.; subg. *Sycidium* sect. *Palaeomorphe* p.p.

Plants (usually) cauliflorous: subg. *Synoecia* sect. *Synoecia* p.p.; subg. *Sycidium* sect. *Sycidium* p.p.; subg. *Sycomorus* p.p.

Plants (usually) flagelliflorous: subg. *Sycomorus* sect. *Hemicardia* (all species) and sect. *Sycocarpus* (many species).

Plants monocaul or sparingly branched (pachycladous) with relatively large tufted leaves: subg. *Sycomorus* sect. *Dammaropsis* p.maj.p., sect. *Adenosperma* and sect. *Sycocarpus* p.min.p.

Plants (usually) deciduous: subg. *Urostigma* subsect. *Urostigma* p.maj.p. and subsect. *Conosycea* (some, e.g., *F. calcicola*), subg. *Pharmacosycea* (*F. albipila*), sect. *Ficus* (*F. glandulifera*, *F. lamponga*), sect. *Sycidium* (some, e.g., *F. melinocarpa* and *F. trachypison*).

Plants showing intermittent growth often with *Terminalia*-branching (internodes of different length, distal tufts of leaves or persistent stipules): subg. *Urostigma* subsect. *Urostigma*, subg. *Pharmacosycea* sect. *Oreosycea*, subg. *Ficus* subsect. *Frutescentiae*, subg. *Sycidium* sect. *Sycidium* p.p., subg. *Sycomorus* sect. *Adenosperma*.

Plants with uncinate hairs; *F. asperiuscula, F. recurva* p.p.

Plants without waxy glandular spots: subg. *Pharmacosycea* subsect. *Pedunculatae* (all species) or often or always without waxy glands on the leaves and also absent on the leafy twigs or petioles: *F. aurata* and *F. oleifolia* (subg. *Ficus*), *F. erythrosperma* and *F. suffruticosa* (subg. *Sycomorus* sect. *Adenosperma*) and subg. *Sycomorus* subsect. *Sycocarpus* several, e.g., *F. benguetensis*, *F. parvibracteata*, *F. pleyteana*, *F. saurauioides*, and *F. ternatana*.

Plants with irritating hairs: *F. cucurbitina, F. halmahaerae, F. odoardii*, *F. pungens*.

Leaves

Lamina normally/mostly lobate in juvenile or also in adult plants: several species of subg. *Ficus*, e.g., *F. aurata*, *F. carica*, *F. grossularioides*, *F. hirta*, and some species of subg. *Sycidium* sect. *Sycidium*: *F. asperiuscula*, *F. copiosa*, *F. heterophylla*, and *F. montana*.

Lamina with the tertiary venation (largely) parallel to the lateral veins: species of subg. *Urostigma* sect. *Stilpnophyllum* (all species), subsect. *Conosycea*, *F. benjamina*-group; subg. *Pharmacosycea*: *F. subtrinervia*.

Lamina and presence and distribution of cystoliths: see p. 19.

Stipules not fully amplexicaul: subg. *Sycidium* (many species always or sometimes), subg. *Ficus* subsect. *Frutescentiae* (most species, some or all stipules: *F. ischnopoda*).

Syconia

Fig receptacle always or often very large, more than 5 cm (up to c. 10 or c. 15 cm) diam. (or long): subg. *Urostigma* subsect. *Malvanthera* (*F. hesperidiiformis* p.p.); subg. *Synoecia* sect. *Synoecia* (*F. carrii*, *F. cavernicola*, *F. densechini*, *F. grandiflora*, *F. gymnorygma*, *F. peninsula*, *F. punctata*, *F. singalana, F. scratchleyana* p.p.) and sect. *Rhizocladus* (*F. odoardii*); subg. *Sycidium* (*F. primaria*); subg. *Sycomorus* subsect. *Neomorphe* (*F. auriculata*, *F. robusta)*, sect. *Dammaropsis* (*F. dammaropsis*), and subsect. *Sycocarpus* (*F. cassidyana*, *F. cereicarpa F. iodotricha*, *F. sublimbata*, *F. tarennifolia*).

Fig receptacle small, always or mostly 0.2–0.4 cm (up to 0.5 cm) diam.: subg. *Urostigma* subsect. *Urostigma* (*F. caulocarpa* p.p.) and subsect. *Conosycea* (*F. binnendijkii* p.p., *F. microsyce*, *F. spathulifolia*, *F. sumatrana* p.p.); subg. *Pharmacosycea* (*F. inhuensis*); subg. *Ficus* (*F. oleifolia* p.p.); subg. *Synoecia* sect. *Synoecia* (*F. disticha* p.p.) and sect. *Rhizocladus* (*F. excavata*, *F. pendens*, *F. recurva* p.p.); subg. *Sycidium* sect. *Sycidium* (*F. anastomosans*, *F. aurita* p.p.) and sect. *Palaeomorphe* p.maj.p.

Fig receptacle always (or often) turning dark purple to black at (full) maturity: subg. *Urostigma* subsect. *Urostigma* (all), subsect. *Conosycea* (*F. acamptophylla*, *F. forstenii*, *F. glaberrima*, *F. microcarpa*, *F. subcordata*; subg. *Pharmacosycea* (*F. bataanensis*); subg. *Ficus* (*F. deltoidea*, *F. ischnopoda*, *F. oleifolia*); subg. *Synoecia* (*F. apiocarpa*, *F. pantoniana*, *F. pleiadenia*, *F. punctata*, *F. ruginervia*); subg. *Sycidium* (*F. asperiuscula*, *F. cumingii*, *F. melanocarpa*, *F. opposita*); subg. *Sycomorus* (*F. auriculata*, *F. bernaysii*, *F. dammaropsis*, *F. nodosa*, *F. racemosa*).

Basal bracts caducous: subg. *Urostigma* subsect. *Urostigma*: *F. concinna*, *F. subpisocarpa*, *F. superba*, subsect. *Conosycea*: *F. annulata*, *F. chrysolepis*, *F. depressa*, *F. glaberrima*, *F. microcarpa* p.p., sect. *Stilpnophyllum*: all; subg. *Synoecia* sect. *Kissosycea*: *F. disticha*, sect. *Rhizocladus* subsect. *Punctuliifoliae*: p.maj.p.

Receptacle without lateral bracts: subg. *Urostigma*; subg. *Pharmacosycea*; subg. *Ficus* p.maj.p.; subg. *Synoecia*; subg. *Sycomorus* sect. *Bosscheria*, sect. *Papuasyce*, sect. *Sycomorus* p.maj.p.

Receptacle usually with lateral bracts: subg. *Ficus*: *F. hirta* subsp. *roxburghii* (and some other species occasionally); subg. *Sycidium* sect. Sycidium p.maj.p.; subg. *Sycomorus* sect. *Adenosperma* p.maj.p., sect. *Hemicardia* p.p., sect. *Dammaropsis* p.maj.p., and sect. *Sycocarpus* p.maj.p.

Basal bracts not in a whorl of (2 or) 3 but more or less scattered on the peduncle: subg. *Pharmacosycea* p.min.p., subg. *Sycidium* p.maj.p., subg. *Sycomorus* sect. *Adenosperma* p.maj.p., sect. *Sycocarpus* p.min.p., e.g., *F. calopilina* and *F. limosa*.

Basal bracts not clearly distinguishable from lateral bracts (and all relatively large): subg. *Sycomorus* (*F. dammaropsis*, *F. macrostyla*, *F. uncinata* and other species of *F. stolonifera*-group).

Receptacle with interfloral bracts: subg. *Urostigma* and subg. *Pharmacosycea*.

Receptacle without internal bracts or only bract(eole)s subtending staminate flowers: subg. *Ficus*, subg. *Synoecia*, subg. *Sycidium*, and subg. *Sycomorus* (bracteoles).

Receptacle (usually/often) with internal hairs: subg. *Urostigma* subsect. *Urostigma* p.maj.p. and subsect. *Conosycea* p.min.p.; subg. *Ficus* p.maj.p., subg. *Synoecia* p.maj.p., subg. *Sycidium* p.maj.p., subg. *Sycomorus* (p.maj.p., excl. sect. *Sycomorus* p.maj.p.).

Ostiole slit-shaped or tri-radiate (with all ostiolar bracts descending): subg. *Urostigma* subsect. *Malvanthera*.

Staminate flowers always or usually with one stamen: subg. *Urostigma*; subg. *Pharmacosycea* sect. *Oreosycea* p.p.; subg. *Ficus* p.min.p.; subg. *Synoecia* sect. *Synoecia* p.maj.p.; subg. *Sycidium* p.maj.p.; subg. *Sycomorus* sect. *Adenosperma*, sect. *Bosscheria*, sect. *Hemicardia* p.p., sect. *Papuasyce* p.p., sect. *Sycocarpus* p.maj.p.

Staminate flowers always or usually with 2 (rarely 3) stamens: subg. *Pharmacosycea* sect. *Oreosycea* p.p.; subg. *Ficus* p.maj.p.; subg. *Synoecia* sect. *Rhizocladus* p.maj.p.; subg. *Sycomorus* sect. *Sycomorus*, sect. *Hemicardia* p.p., sect. *Dammaropsis*.

Anthers with one theca: subg. *Urostigma* subsect. *Malvanthera*.

Anthers peltate: subg. *Urostigma* subsect. *Malvanthera*: *F. hesperidiiformis*.

Pistillode present: subg. *Sycidium* (always), subg. *Pharmacosycea* (often), subg. *Synoecia* sect. *Kissosycea* (sometimes in neuter flowers), subg. *Sycomorus* (sometimes).

Perianth of staminate flower tubular: subg. *Sycomorus* (most species), subg. *Synoecia* sect. *Kissosycea* (most species).

Perianth of pistillate flower tubular: subg. *Sycomorus* subsect. *Sycocarpus* (short-styled flowers only!) and subsect. *Neomorphe*: *F. auriculata* p.p.

Perianth of pistillate flower strongly reduced or absent: subg. *Sycomorus* sect. *Sycocarpus* (long-styled flowers only!) p.maj.p.

Fruits

Fruits clearly drupaceous (and endocarp bodies released): subg. *Sycidium* sect. *Sycidium*: *F. montana*-group.

KEY TO THE SUBGENERA OF FICUS

1a. Plants monoecious, the figs containing pistillate flowers with different style lengths and staminate (or neuter) flowers; leaves usually spirally arranged, rarely subdistichous or subopposite; lamina rarely scabrous 2
b. Plants (gyno)dioecious, the figs containing either staminate flowers and pistillate flowers with short styles or only pistillate flowers with long styles (or also neuter flowers), rarely the styles different in length (*F. itoana*); leaves often distichous or (sub)opposite 4
2a. Figs without interfloral bracts; staminate flowers ostiolar and subtended or enveloped by bracteoles . . . . . Subg. **Sycomorus** (pp. 301–465)
b. Figs with interfloral bracts; staminate flowers mostly disperse and without bracteoles 3
3a. Waxy gland one, at the base of the midrib beneath; aerial adventitious roots usually present; stamen usually 1; stigmas usually 1 and distinctly papillate, or if 2 or not distinctly papillate, then the fruits usually (partly) embedded in the wall of the fig . . . . . Subg. **Urostigma** (pp. 559–700)
b. Waxy glands two, in the axils of the basal lateral veins beneath (or absent); aerial roots absent; stamens 1 or 2; stigma usually 2, usually without distinct papillae . . . . . Subg. **Pharmacosycea** (pp. 137–168)
4a. Stipules often not fully amplexicaul; lamina often asymmetric; bracts mostly scattered on the peduncle and not 3 in a whorl as basal bracts; pistillode (or pistil) always present in the staminate flower . . . . . Subg. **Sycidium** (pp. 169–299)
b. Stipules (nearly always) fully amplexicaul; lamina symmetric or asymmetric; basal bracts 3, in a whorl, sometimes basal and lateral bracts not distinguishable; pistillode rarely present 5
5a. Root-climbers usually with pronounced leaf dimorphy . . . . . Subg. **Synoecia** (pp. 467–558)
b. Trees or shrubs without aerial roots and without leaf dimorphy 6
6a. Staminate flowers ostiolar and (mostly) subtended or enveloped by bracteoles; figs often cauliflorous or flagelliflorous; lateral bracts often present; lamina often asymmetric; in dried material the nodes of leafy twigs often thicker than the internodes and the lamina with lead-coloured spots above . Subg. **Sycomorus** (pp. 301–465)
b. Staminate flowers disperse or ostiolar, not subtended by bracteoles; figs mostly axillary or just below the leaves; lamina symmetric; in dried material the nodes of leafy twigs almost as thick as the internodes and lead-coloured spots absent on the lamina above . . . . . Subg. **Ficus** (pp. 71–136)

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FICUS subgenus FICUS

Ficus L. subg. *Ficus*: Corner, Gard. Bull. Singapore 17 (1960) 417. — *Ficus* L. sect. *Carica* Miq., Ann. Sci. Nat. Bot., Sér. 3, 1 (1844) 32. — *Ficus* L. subg. *Eusyce* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 289. — *Ficus* L. subg. *Carica* (Miq.) Mildbr. & Burret, Bot. Jahrb. Syst. 46 (1912) 174; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 179, '*Caricae*'. — *Ficus* L. subg. *Metamorphae* Sata, J. Soc. Trop. Agr. Taiwan 6 (1934) 19. — *Ficus* L. subg. *Eumetamorphae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 244.

Shrubs, small to medium-sized (or tall) trees, with white milk sap, (gyno)dioecious. *Leafy twigs* usually solid, often with copious pith. *Leaves* spirally arranged, sometimes to subdistichous; lamina chartaceous to coriaceous, various in shape, often at least when juvenile (sub)palmately 3–7-lobed to -fid, symmetric (or slightly asymmetric); waxy glandular spots usually in the axils of the basal lateral veins of the lamina beneath, sometimes also in the axils of other lateral veins, or in *F. deltoidea* in furcations of the midrib, sometimes present on the nodes of the twigs or at the base of the petiole; stipules free, fully amplexicaul, but in *F. ischnopoda* semi-amplexicaul to lateral. *Figs* axillary or below the leaves on previous season's growth, in pairs (or solitary); basal bracts 3, verticillate; lateral bracts normally absent. *Staminate flowers* near the ostiole or scattered. *Tepals* 3–5, (almost) free. *Stamens* 1–4. *Stigmas* of long-styled flowers with two, mostly unequally long, stigmatic branches or only one.

DISTRIBUTION

The subgenus is Asian-western Malesian. In Malesia, it extends to New Guinea (with *F. glandulifera* and *F. pedunculosa*). From Asia it extends to NE Africa (with *F. palmata* Forssk.) and to mediterranean southern Europe (with *F. carica*). The subgenus has two centres, the Sino-Himalayan region (with the *F. pedunculosa*-group of sect. *Frutescentiae*) and western Malesia (with the *F. deltoidea*-group of sect. *Frutescentiae* and sect. *Eriosycea*). The clearly Asian subdivisions, subsect. *Ficus* and the *F. pedunculosa*-group, comprise species, that extend to warm-temperate zones (in Asia, Korea and Japan). Two species of the latter group, *F. ischnopoda* and *F. pedunculosa*, extend to Malesia and two, *F. edanoi* and *F. pustulata*, are Malesian and confined to the Philippines. Six species of the Malesian subdivisions extend to the Asian mainland (*F. chartacea*, *F. deltoidea*, *F. fulva*, *F. glandulifera*, *F. lamponga*, and *F. hirta*). Few species have wide ranges, *F. glandulifera* has the most extensive one, from the Andaman Islands to New Guinea. The subgenus comprises c. 50 species of which 35 occur in Malesia. Two species of this subgenus have been introduced into the Malesian region: *F. carica* and *F. erecta*.

MORPHOLOGICAL VARIATION

Habit — The majority of the species are shrubs or small trees, less often medium-sized trees. Tall trees may become buttressed (as in *F. brunneoaurata* and *F. mollissima*). In *F. oleifolia,* trees can be slender and subscandent. Holo-epiphytes (or -lithophytes) often occur in *F. deltoidea*, less often in *F. oleifolia*. In *F. ischnopoda* and *F. pustulata*, the plants are more or less often rheophytic.

Leaves — The leaves are alternate and spirally arranged. There is a slight tendency towards distichous arrangement in some species. The leaves can be subopposite or subverticillate in *F. ischnopoda*. In this species the stipules are semi-amplexicaul to lateral. This character is linked to the intermittent growth with *Terminalia*-branching of species of the *F. pedunculosa*-group. In many species (of sect. *Ficus* subsect. *Ficus* and of sect. *Eriosycea*) the lamina is palmately 3–7-lobed to -fid, only in juvenile plants, but in several species also on fertile branches. In this type of leaves the petioles are relatively long, the basal lateral of the lamina branched, the margin dentate and the texture chartaceous to subcoriaceous. In *F. hirta,* the incised lamina may be distinctly palmately lobed to fid or it is subpalmately (or subpinnately), as not the basal lateral veins run into the lobes but those of the next pair. In this species, the midsegment can also be (faintly) pinnately lobed. In sect. *Ficus* subsect. *Frutescentiae,* there is tendency towards pinnate lobing of the lamina, at least in juvenile plants. In this section, the lamina may also vary to linear-lanceolate, in some cases in relation to the rheophytic life form. Midribs with furcations far below the apex of the lamina are found in *F. deltoidea* and *F. oleifolia*. In *F. pedunculosa* the furcation is close to the apex.

Cystoliths — These are lacking in the lamina of representatives of sect. *Eriosycea* and present only beneath or also above in those of sect. *Ficus*.

Waxy glandular spots — In most cases, there are two of them on the lamina beneath in the axils of the (main) basal lateral veins. Waxy glands occur sometimes also in the axils of other lateral veins, occasionally there are two accessory ones in the axils of other basal veins (as in *F. mollissima*), or in *F. deltoidea* in dichotomous ramifications of the veins. Waxy glands are sometimes absent on the leaves. In several species, as *F. aureobrunnea*, *F. aureocordata*, *F. bruneiensis*, *F. eumorpha*, *F. glandulifera*, *F. padana*, and *F. subglabripetiolata*, there are normally pairs of waxy glands at the base of the petiole. In other species, like *F. fulva*, single waxy glands median at the base of the petiole may occur, but they are often small and inconspicuous and apparently not consistently present.

Inflorescences — The inflorescences occur mostly in pairs, only in a few species, as *F. ischnopoda* and *F. pustulata*, they are consistently solitary. They are mostly produced in the leaf axils, less often below the leaves, but then only on previous season's growth. The figs are mostly pedunculate or quite often both pedunculate and sessile in the same species. The receptacle varies from very small (0.5–1 cm diam. when dry) to medium-sized (1–2 cm diam. when dry), with only in some species, *F. bruneiensis*, *F. carica, F. mollissima*, and *F. padana*, the diameter of dry receptacles exceeds 2 cm. The receptacle is often stipitate. In several species or subspecies, such as *F. aurata*, *F. esquiroliana* H. Lév., and *F. hirta* subsp. *roxburghii*, the receptacle may bear lateral bracts, mostly one or two, sometimes more than two. Internal hairs vary from copious and conspicuous to sparse and minute, or they may even be absent. The colour of mature 'seed-figs' is mostly red, less frequently yellow to orange, or in some species, *F. deltoidea*, *F. ischnopoda*, and *F. oleifolia*, purple (to blackish). Mature 'gall-figs' usually have paler colours than 'seed-figs' and may even remain greenish. In some species, *F. glandulifera*, *F. lamponga*, and *F. ruficaulis*, 'gall-figs' dehisce longitudinally and irregularly.

Flowers — In *F. oleifolia* the number of flowers in the 'seed-figs' can be reduced to two or even one (thus producing only one seed per syconium!). The staminate flowers often occur near the ostiole, but can also occur dispersed among the pistillate flowers, occasionally or often (as in species of sect. *Ficus*). Within the subgenus three types of tepals can be distinguished:

1. pale yellow or pinkish and glabrous or ciliolate (in *F. carica*);
2. dark red (in strong contrast with the pale pedicels and ovaries or fruits) and often ciliolate or with some hairs at the apex (in subsect. *Frutescentiae* and subsect. *Eriosycea*);
3. pale yellow with numerous hairs or only a few in the upper part (in subsect. *Auratae*, but dark red in *F. diamantiphylla*).

The stigmas have two unequally long filiform to subulate stigmatic branches in the long-styled flowers of sect. *Ficus*, or are either ± filiform or bifid in sect. *Eriosycea*, in which short stiff hairs may occur on the pedicel, below the ovaries or stamens, or on the style.

Fruitlets — The fruitlets are either smooth (in sect. *Ficus*) or tuberculate (in sect. *Eriosycea*). They are usually small, 1–2 mm long, but are large (3–4 mm long) in *F. deltoidea* and *F. oleifolia*.

DELIMITATION

In Corner's concept (1958: 21, 34; 1960: 416, 417) this gynodioecious taxon (treated as a section!) included four more species: *F. rivularis* (from the Philippines), *F. pseudopalma* (from the Philippines), *F. henryi* Diels (from China and Tibet), and *F. subincisa* Sm. (from the Himalayas to Laos and Thailand). On the bases of characters of the flowers (in particular the staminate flowers subtended by two bracteoles), the former two species have been transferred to subgenus *Sycomorus* (s.l.) and on the bases of characters of the staminate flowers (namely the presence of pistillodes), the distichous leaves, and the not fully amplexicaul stipules, the latter two species have been transferred to subgenus *Sycidium* (Berg 2003).

The other three (gyno)dioecious subgenera (*Synoecia*, *Sycidium*, and *Sycomorus*) can be distinguished from subg. *Ficus* mostly rather easily, even without taking into account floral characters. The main differentiating characters of subg. *Ficus* are: leaves spirally arranged; leafy twigs (usually) solid; lamina symmetric; stipules fully amplexicaul (except in *F. ischnopoda* and some related species on some of the nodes); figs in the leaf axils or just below the leaves on previous season's growth; basal bracts 3 in a whorl; and absence of lateral bracts on the receptacle. Also some floral characters are of importance: the free tepals of the pistillate flowers being either dark red (contrasting against other pale structures in the fig cavity) or pale with hairs in the upper part. Subgenus *Synoecia* can be distinguished by the habit: root climbers with usually ± pronounced differences between leaves of fertile branches and those of sterile branches – and the distichous arrangement of the leaves. Representatives of subg. *Sycidium* can be distinguished primarily by the stipules not being fully amplexicaul (as in most species of the subgenus) and the fact that the bracts are usually not arranged as basal

bracts in a whorl, but occur more or less scattered along the peduncle or concentrated near the base of the peduncle. In the (few) cases that these features are not conclusive the presence of lateral bracts on the receptacle or pistillodes in the staminate flowers may provide clues to the identity. Representatives of subg. *Sycomorus* can be distinguished by opposite or distichous leaves, hollow internodes, asymmetric laminas, common presence of lateral bracts on the receptacle, figs born on more or less elongate leafless branchlets on the older wood, and/or the commonly concave apex of the fig receptacle (at least in dry condition). In cases of doubt the red-brown colour of floral parts will indicate the identity.

References: Berg, C.C., Flora Malesiana precursor for the treatment of Moraceae 1: The main subdivision of Ficus: the subgenera. Blumea 48 (2003) 167–178. — Corner, E.J.H., An introduction to the distribution of Ficus. Reinwardtia 4, 3 (1958) 15–45. — Corner, E.J.H., Taxonomic notes on Ficus Linn., Asia and Australasia. III. Subgen. Ficus and sect. Ficus. Gard. Bull. Singapore 17 (1960) 416–441.

SUBDIVISION

Subgenus *Ficus* can be subdivided into two groups: sect. *Ficus* and sect. *Eriosycea*; both can be subdivided into two subsections: *Ficus* and *Frutescentiae* in the former section and subsections *Eriosycea* and *Auratae* in the latter one.

The subdivision of the subgenus is as follows:

- Subg. *Ficus*
  - Sect. *Ficus*
    - Subsect. *Ficus*
    - Subsect. *Frutescentiae*
      - *Ficus deltoidea*-group
      - *Ficus pedunculosa*-group
  - Sect. *Eriosycea*
    - Subsect. *Eriosycea*
      - *Ficus chartacea*-group
      - *Ficus fulva*-group
      - *Ficus glandulifera*-group
      - *Ficus grossularioides*-group
    - Subsect. *Auratae*

KEY TO THE SUBSECTIONS

1a. Tepals dark red 2
b. Tepals whitish, yellowish, or pinkish 3
2a. Internodes distinctly different in length on the same twig, often tufts of subpersistent stipules at the leafy twig apices; lamina with cystoliths (beneath); fruits smooth . . . . . Subsect. **Frutescentiae**
b. Internodes mostly similar in length on the same twig, without tufts of subpersistent stipules at the leafy twig apices; lamina without cystoliths; fruits tuberculate . . . . . Subsect. **Eriosycea**

3a. Tepals glabrous or ciliolate; lamina with cystoliths (beneath); fruits smooth . . . . . Subsect. **Ficus**
b. Tepals with stiff hairs; lamina without cystoliths; fruits tuberculate . . . . . Subsect. **Auratae**

KEY TO THE SPECIES

1a. Lower surface of the lamina with hairs in the areoles 2
b. Lower surface of the lamina with hairs (almost) confined to the veins and veinlets or glabrous 9
2a. Densely felted-tomentose or -villous in the areoles, this indumentum covering at least the lesser vein reticulations 3
b. Densely puberulous in the areoles as well as on the venation and there intermixed with longer stiff brownish hairs 7
3a. Stipules 2–5 cm long; figs in the leaf axils, the receptacle 2–3.5 cm diam. when dry. — Sumatra, Java . . . . . **23. F. padana**
b. Stipules 0.5–1.8 cm long; figs mostly below the leaves, the receptacle 0.5–1.8 cm diam. when dry 4
4a. Lamina with entire (or crenate) margin, usually smooth above, (sub)coriaceous 5
b. Lamina with dentate to denticulate margin, usually scabrous to scabridulous above, chartaceous to subcoriaceous 6
5a. Lamina mostly shorter than 10 cm and less than 5 cm wide; figs sessile. — Sumatra . . . . . **16c. F. grossularioides** var. **stenoloba**
b. Lamina mostly longer than 10 cm and more than 5 cm wide; figs mostly pedunculate. — Sumatra, Java, Borneo, Celebes, Moluccas . . . . . **27. F. tricolor**
6a. Lamina mostly elliptic to oblong, 3–15 by 1.5–7.5 cm, the base cuneate to rounded; figs usually sessile, the receptacle mostly up to 1 cm diam. when dry; low altitudes. — Sumatra, Malay Peninsula, Java, Borneo . . **16. F. grossularioides**
b. Lamina mostly cordiform to ovate, mostly 13–25 by 9–20 cm, the base mostly cordate to truncate; figs pedunculate, the receptacle 1–1.5 cm diam. when dry; (sub)montane. — Malay Peninsula . . . . . **27b. F. tricolor** var. **robusta**
7a. Leafy twigs hollow; fig receptacle 2–3 cm diam. when dry. — Borneo . . . . . **32. F. bruneiensis**
b. Leafy twigs solid; fig receptacle 1–1.8 cm diam. when dry 8
8a. Stipules 1–3.5 cm long, appressed-puberulous to sericeous and on the keel also longer and stiff hairs; fig receptacle predominantly whitish puberulous. — Borneo . . . . . **33. F. brunneoaurata**
b. Stipules 0.5–1(–1.5) cm long, hirtellous to substrigose with one type of hairs; fig receptacle densely brown hirtellous to subvelutinous. — Borneo . . . . . **36. F. eumorpha**
9a. Margin of the lamina dentate, denticulate or crenate 10
b. Margin of the lamina entire or subentire (sometimes sinuate to sublobate) . . 39
10a. Stipules only ciliolate or, if hairy outside, then sparsely white puberulous on the keel; lamina 3–7-lobed to -fid also on fertile branches; fig receptacle usually (sub)pyriform and at least 1.5 cm diam. when dry; introduced, fruit tree. — Widespread . . . . . **1. F. carica**

b. Stipules densely hairy or, if sparsely, then at least with some brownish stiff hairs on the keel or a tuft of hairs at the apex; lamina 3–7-lobed to -fid usually only on sterile branches; fig receptacle not pyriform or, if subpyriform, then less than 1.5 cm diam. when dry 11

11a. Waxy glands in pairs, laterally at the base of the petiole 12

b. Waxy glands lacking at the base of the petiole, or if present, then inconspicuously and median at the base of the petiole 19

12a. Lamina about as long as broad 13

b. Lamina distinctly longer than broad 14

13a. Stipules (1–)1.5–2.5(–3) cm long. — Borneo . . . . . **35. F. endospermifolia**

b. Stipules 0.8–1.5 cm long. — Sumatra, Java . . . . . **13. F. fulva**

14a. Stipules partly whitish hairy, 1.5–2.5 cm long. — Widespread . . . . **13. F. fulva**

b. Stipules brownish to yellowish hairy, mostly shorter or longer 15

15a. Stipules 0.4–0.8 cm long 16

b. Stipules 1.2–2.5(–3.2) cm long 17

16a. Lamina ± scabrous above; figs sessile. — Sumatra . . . . **40. F. subglabritepala**

b. Lamina smooth above; figs pedunculate. — Widespread . . . **15. F. glandulifera**

17a. Internodes solid; fig pedunculate or sessile, the receptacle usually 1–1.5 cm diam. when dry. — Widespread . . . . . **13. F. fulva**

b. Internodes hollow; fig sessile, the receptacle 2–2.5 cm diam. when dry 18

18a. Lateral veins 5 or 6 pairs; stipules c. 1.5 cm long. — Borneo . . . . . **30. F. aureocordata**

b. Lateral veins 8 or 9 pairs; stipules 1.5–3 cm long. — Borneo . . . . . **34. F. diamantiphylla**

19a. Stipules up to 1 cm long and/or petioles 1–4 cm long 20

b. Stipules mostly longer than 1 cm and/or petioles mostly longer than 4 cm . . 25

20a. Stipules white hairy (subsericeous). — Borneo . . . . . **38. F. macilenta**

b. Stipules brown or brownish hairy 21

21a. Basal lateral veins up to 1/2–2/3 the length of the lamina 22

b. Basal lateral veins up to 1/2 the length of the lamina; epidermis of the petiole persistent 23

22a. Epidermis of the petiole flaking off; figs pedunculate. — Borneo **26. F. subfulva**

b. Epidermis of petiole persistent; figs sessile. — Borneo . . . . . **31. F. auricoma**

23a. Basal lateral veins up to 1/4–1/3 the length of the lamina. — Borneo . . . . . **37. F. inaequipetiolata**

b. Basal lateral veins up to 1/3–1/2 the length of the lamina 24

24a. Fig receptacle at least 1 cm diam. when dry, hirtellous to hirsute or subhispidulous. — Sumatra, Malay Peninsula, Borneo, Philippines . . . . . **29. F. aurata**

b. Fig receptacle up to 1 cm diam. when dry, appressed-puberulous. — Borneo . . . . . **39. F. setiflora**

25a. Lamina smooth above 26

b. Lamina scabrous to scabridulous above 31

26a. Lamina cordiform to ovate; leafy twigs velutinous or setose (with irritating hairs) 27

b. Lamina elliptic to oblong to subobovate or subpandurate 29

27a. Stipules c. 2.5 cm long; leafy twigs setose with irritating hairs. — Moluccas . . . . . **17. F. halmaherae**
b. Stipules c. 1 cm long; leafy twigs velutinous or subhirsute 28
28a. Indumentum pale brown to yellowish. — Malay Peninsula . . **21. F. mollissima**
b. Indumentum bright rusty brown. — Borneo . . . . . **30. F. aureocordata**
29a. Epidermis of the petiole flaking off; fig peduncle 0.4–1 cm long; stipules brown appressed-puberulous to subsericeous. — Borneo . . . . . **26. F. subfulva**
b. Epidermis of the petiole persistent; figs sessile or with a peduncle up to 0.5 cm long; stipules whitish sericeous (to yellowish subsericeous) or brown hirsute . 30
30a. Basal bracts of the fig 4–5 mm long, yellow appressed-puberulous; petiole varying in length from 2 to 4.5 cm and stipules c. 1 cm long. — Borneo . . . . . **31. F. auricoma**
b. Basal bracts of the figs 2–3.5 mm long, shortly white sericeous; petiole varying in length from 1 to 14 cm and stipules varying in length from 0.8 to 3.2 cm. — Widespread . . . . . **13. F. fulva**
31a. Lamina cordiform to ovate in outline, base (sub)cordate 32
b. Lamina elliptic to oblong to (sub)obovate to pandurate in outline 33
32a. Stipules with brown hairs in the middle and finer white hairs towards the margin and often longer than 2 cm; basal bracts 8–25 mm long, often caducous. — Sumatra, Malay Peninsula . . . . . **18d. F. hirta** subsp. **roxburghii**
b. Stipules with only one type and colour of hairs and usually shorter than 2 cm; basal bracts 4–5 mm long, persistent. — Borneo . . . . . **30. F. aureocordata**
33a. Stipules with stiff hairs only on the keel . . . . . **18. F. hirta**
b. Stipules with the same type of hairs covering the whole surface 34
34a. Basal lateral veins up to 1/3 the length of the lamina; stipules yellowish sericeous. — Sumatra . . . . . **18c. F. hirta** subsp. **ochracea**
b. Basal lateral veins up to 1/3–2/3 the length of the lamina; stipules whitish to yellowish or brownish sericeous or strigose 35
35a. Stipules partly finely whitish sericeous. — Widespread . . . . . **13. F. fulva**
b. Stipules brown sericeous or strigose 36
36a. Figs pedunculate 37
b. Figs sessile 38
37a. Basal lateral veins branched; fig receptacle appressed puberulous. — Borneo . . . . . **26. F. subfulva**
b. Basal lateral veins unbranched; fig receptacle subvelutinous. — Sumatra, Malay Peninsula, Borneo, Philippines . . . . . **29. F. aurata**
38a. Stipules 0.5–2 cm long; lamina 5–20(–30) cm long. — Sumatra, Malay Peninsula, Borneo, Philippines . . . . . **29. F. aurata**
b. Stipules 2–6 cm long; lamina 40–50 cm long. — Borneo **34. F. diamantiphylla**
39a. Stipules only ciliolate, with a tuft of hairs at the apex or entirely glabrous . . 40
b. Stipules hairy outside, at least on the keel 51
40a. Fig receptacle with papillae on the surface. — Philippines . . . **10. F. pustulata**
b. Fig receptacle without papillae on the surface 41
41a. Stipules with a small tuft of hairs at the apex. — Sumatra . . **25. F. schefferiana**
b. Stipules without a tuft of hairs at the apex 42

42a. Upper surface of lamina ± scabrous; stipules subpersistent. — Philippines . . . . . **5. F. glareosa**
b. Upper surface of lamina smooth (or scabridulous); stipules caducous (or subpersistent) 43
43a. Epidermis of the petiole flaking off 44
b. Epidermis of the petiole persistent 46
44a. Lamina hairy and the reticulum prominent beneath, the midrib not furcate. — Sumatra . . . . . **14. F. glabristipulata**
b. Lamina (almost) glabrous and the reticulum flat beneath, the midrib often not reaching the apex of the lamina 45
45a. Base of the lamina cordulate-auriculate. — Philippines . . . . . **3. F. edanoi**
b. Base of the lamina (sub)cuneate. — Sumatra, Malay Peninsula, Java, Borneo, Celebes, Moluccas . . . . . **2. F. deltoidea**
46a. Lamina linear-lanceolate, 6–10 times as long as broad; fig receptacle 1.5–2.3 cm diam. when dry. — Malay Peninsula . . . . . **6. F. ischnopoda**
b. Lamina broader or, if linear-lanceolate, then the fig receptacle less than 1 cm diam. when dry 47
47a. Lamina coriaceous, the apex acuminate to obtuse to rounded, the tertiary venation largely parallel to the lateral veins to reticulate 48
b. Lamina chartaceous (to subcoriaceous), the apex acuminate to subcaudate, the tertiary venation loosely scalariform 49
48a. Stipules subpersistent; lateral veins mostly 9–15 pairs. — Celebes . . . . . **7. F. kofmaniae**
b. Stipules caducous; lateral veins mostly 4–8 pairs. — Sumatra, Malay Peninsula, Borneo, Philippines, Celebes . . . . . **8. F. oleifolia**
49a. Lateral veins (8–)10–13(–18) pairs. — Sumatra, Malay Peninsula, Borneo, Celebes . . . . . **19. F. lamponga**
b. Lateral veins 4–9 pairs 50
50a. Lamina with cystoliths (visible as minute pustules or points) beneath; fig receptacle 1.2–1.8 cm diam. when dry, the peduncle 0.5–2(–3) cm long; introduced, ornamental shrub or treelet. — Java, Borneo . . . . . **4. F. erecta**
b. Lamina without cystoliths; fig receptacle 0.4–0.8 cm diam. when dry, the peduncle 0.1–0.4 cm long or the fig sessile. — Malay Peninsula, Borneo . . . . . **12. F. chartacea**
51a. Waxy glandular spots in pairs at the base of the petiole. — Widespread . . . . . **15. F. glandulifera**
b. Waxy glands absent at the base of the petiole 52
52a. Periderm of the leafy twigs and/or the epidermis of the petiole flaking off . . 53
b. Periderm of the leafy twigs and epidermis of the petiole persistent 59
53a. Midrib of the lamina not reaching the apex of the lamina 54
b. Midrib reaching the apex of the lamina 55
54a. Indumentum of the stipules brown. — Philippines, Celebes, Moluccas, New Guinea . . . . . **9. F. pedunculosa**
b. Indumentum of the stipules white. — Sumatra, Malay Peninsula, Java, Borneo, Celebes, Moluccas . . . . . **2. F. deltoidea**

55a. Stipules white, whitish or yellowish hairy 56
b. Stipules brown or brownish hairy 58
56a. Leafy twigs and petioles hispidulous, ± scabrous; epidermis of the petiole (±) flaking off. — Borneo . . . . . **28. F. androchaete**
b. Leafy twigs and petioles not ± scabrous; epidermis of the petiole persistent . 57
57a. Stipules 0.8–1.2 cm long; fig receptacle (sub)glabrous. — Philippines . . . . . **11. F. banahaensis**
b. Stipules 1.2–2 cm long; fig receptacle hairy. — Philippines, Celebes . . . . . **24. F. ruficaulis**
58a. Leafy twigs and petioles hispidulous, ± scabrous. — Borneo . . . **26. F. subfulva**
b. Leafy twigs and petioles smooth. — Philippines, Celebes . . . . **24. F. ruficaulis**
59a. Stipules subpersistent. — Philippines . . . . . **5. F. glareosa**
b. Stipules caducous 60
60a. Indumentum of leafy twigs brown(ish). — Widespread . . . . . **13. F. fulva**
b. Indumentum of leafy twigs whitish or yellowish, often sparse 61
61a. Lateral veins (7–)10–13(–18) pairs, the basal lateral veins hardly or not different from the other lateral veins. — Sumatra, Malay Peninsula, Borneo, Celebes . . . . . **19. F. lamponga**
b. Lateral veins 4–8(–9) pairs, the basal lateral veins ± clearly different from the other lateral veins 62
62a. Stipules 1.2–2 cm long; lamina 12–28 by 7–18 cm; leafy twigs 5–10 mm thick. — Philippines, Celebes . . . . . **24. F. ruficaulis**
b. Stipules 0.4–0.8 cm long; lamina 4–14 by 2–8.5 cm; leafy twigs 1.5–3 mm thick 63
63a. Indumentum on the midrib beneath appressed. — Sumatra . . . **20. F. litseifolia**
b. Indumentum on the midrib beneath patent. — Malay Peninsula **22. F. oreophila**

REGIONAL KEY: MALAY PENINSULA

1a. Lower surface of the lamina with hairs in the areoles 2
b. Lower surface of the lamina with hairs (almost) confined to the veins and veinlets or glabrous 3
2a. Lamina mostly elliptic to oblong, 3–15 by 1.5–7.5 cm, the base cuneate to rounded; figs usually sessile, the receptacle mostly up to 1 cm diam. when dry; low altitudes . . . . . **16. F. grossulariodes**
b. Lamina mostly cordiform to ovate, mostly 13–25 by 9–20 cm, the base mostly cordate to truncate; figs pedunculate, the receptacle 1–1.5 cm diam. when dry; (sub)montane . . . . . **27b. F. tricolor** var. **robusta**
3a. Margin of the lamina dentate, denticulate or crenate 4
b. Margin of the lamina entire or subentire (sometimes sinuate to sublobate) . . 12
4a. Stipules only ciliolate or, if hairy outside, then sparsely white puberulous on the keel; lamina 3–7-lobed to -fid also on fertile branches; fig receptacle usually (sub)pyriform and at least 1.5 cm diam. when dry; introduced, fruit tree . . . . . **1. F. carica**

b. Stipules densely hairy or, if sparsely, then at least with some brownish stiff hairs on the keel; lamina 3–7-lobed to -fid usually only on sterile branches; fig receptacle not pyriform or, if subpyriform, then less than 1.5 cm diam. when dry . . 5
5a. Waxy glands in pairs, laterally at the base of the petiole 6
b. Waxy glands lacking at the base of the petiole, or if present, then inconspicuously and median at the base of the petiole 7
6a. Stipules 0.4–0.8 cm long, usually brown hairy; fig receptacle 0.7–1 cm diam. when dry . . . . . **15. F. glandulifera**
b. Stipules 0.8–3.2 cm long, usually whitish to yellowish hairy; fig receptacle 1–1.6 (–2) cm diam. when dry . . . . . **13. F. fulva**
7a. Stipules up to 1 cm long and/or petioles 1–4 cm long . . . . . **29. F. aurata**
b. Stipules mostly longer than 1 cm and/or petioles mostly longer than 4 cm . . . 8
8a. Lamina smooth above 9
b. Lamina scabrous to scabridulous above 10
9a. Lamina cordiform to ovate, entire; stipules c. 1 cm long; fig receptacle 2–2.5 diam. when dry . . . . . **21. F. mollissima**
b. Lamina elliptic to obovate to oblong to suborbicular, entire or lobed to part; stipules distinctly usually longer than 1 cm; fig receptacle 1–1.6(–2) cm diam. when dry . . . . . **13. F. fulva**
10a. Lamina cordiform to ovate in outline, base (sub)cordate . . . . . **18d. F. hirta** subsp. **roxburghii**
b. Lamina elliptic to oblong to (sub)obovate to pandurate in outline 11
11a. Stipules finely whitish to yellowish sericeous . . . . . **13. F. fulva**
b. Stipules brown sericeous or strigose . . . . . **29. F. aurata**
12a. Stipules only ciliolate or entirely glabrous 13
b. Stipules hairy outside, at least on the keel 17
13a. Epidermis of the petiole flaking off . . . . . **2. F. deltoidea**
b. Epidermis of the petiole persistent 14
14a. Stipules lateral; rheophytic shrub . . . . . **6. F. ischnopoda**
b. Stipules fully amplexicaul; non-rheophytic shrub or tree 15
15a. Lamina coriaceous, the apex acuminate to obtuse to rounded, the tertiary venation largely parallel to the lateral veins to reticulate . . . . . **8. F. oleifolia**
b. Lamina chartaceous (to subcoriaceous), the apex acuminate to subcaudate, the tertiary venation loosely scalariform 16
16a. Lateral veins (8–)10–13(–18) pairs . . . . . **19. F. lamponga**
b. Lateral veins 4–9 pairs . . . . . **12. F. chartacea**
17a. Waxy glandular spots in pairs at the base of the petiole . . . . **15. F. glandulifera**
b. Waxy glands absent at the base of the petiole 18
18a. Periderm of the leafy twigs and/or the epidermis of the petiole flaking off . . . . . **2. F. deltoidea**
b. Periderm of the leafy twigs and epidermis of the petiole persistent 19
19a. Indumentum of leafy twigs brown(ish) . . . . . **13. F. fulva**
b. Indumentum of the leafy twigs whitish or yellowish, often sparse 20

20a. Lateral veins (7–)10–13(–18) pairs, the basal lateral veins hardly or not different from the other lateral veins . . . . . **19. F. lamponga**
b. Lateral veins 4–8(–9) pairs, the basal lateral veins ± clearly different from the other lateral veins . . . . . **22. F. oreophila**

REGIONAL KEY: SUMATRA

1a. Lower surface of the lamina with hairs in the areoles 2
b. Lower surface of the lamina with hairs (almost) confined to the veins and veinlets or glabrous 5
2a. Stipules 2–5 cm long; figs in the leaf axils, the receptacle 2–3.5 cm diam. when dry . . . . . **23. F. padana**
b. Stipules 0.5–1.8 cm long; figs mostly below the leaves, the receptacle 0.5–1.8 cm diam. when dry 3
3a. Lamina with dentate to denticulate margin, usually scabrous to scabridulous above, chartaceous to subcoriaceous . . . . . **16. F. grossulariodes**
b. Lamina with entire (or crenate) margin, usually smooth above, (sub)coriaceous 4
4a. Lamina mostly shorter than 10 cm and less than 5 cm wide; figs sessile . . . . . **16c. F. grossularioides** var. **stenoloba**
b. Lamina mostly longer than 10 cm and more than 5 cm wide; figs mostly pedunculate . . . . . **27. F. tricolor**
5a. Margin of the lamina dentate, denticulate or crenate 6
b. Margin of the lamina entire or subentire (sometimes sinuate to sublobate) . . 15
6a. Stipules only ciliolate or, if hairy outside, then sparsely white puberulous on the keel; lamina 3–7-lobed to -fid also on fertile branches; fig receptacle usually (sub)pyriform and at least 1.5 cm diam. when dry; introduced, fruit tree . . . . . **1. F. carica**
b. Stipules densely hairy or, if sparsely, then at least with some brownish stiff hairs on the keel or a tuft of hairs at the apex; lamina 3–7-lobed to -fid usually only on sterile branches; fig receptacle not pyriform or, if subpyriform, then less than 1.5 cm diam. when dry 7
7a. Waxy glands in pairs, laterally at the base of the petiole 8
b. Waxy glands lacking at the base of the petiole, or if present, then inconspicuously and median at the base of the petiole 9
8a. Stipules 0.4–0.8 cm long, usually brown hairy; fig receptacle 0.7–1 cm diam. when dry . . . . . **15. F. glandulifera**
b. Stipules 0.8–3.2 cm long, usually whitish to yellowish hairy; fig receptacle 1–1.6 (–2) cm diam. when dry . . . . . **13. F. fulva**
9a. Stipules up to 1 cm long and/or petioles 1–4 cm long . . . . . **29. F. aurata**
b. Stipules mostly longer than 1 cm and/or petioles mostly longer than 4 cm . . 10
10a. Lamina smooth above . . . . . **13. F. fulva**
b. Lamina scabrous to scabridulous above 11
11a. Lamina cordiform to ovate in outline, base (sub)cordate . . . . . **18d. F. hirta** subsp. **roxburghii**

b. Lamina elliptic to oblong to (sub)obovate to pandurate in outline 12
12a. Stipules with stiff hairs only on the keel . . . . . **18. F. hirta**
b. Stipules with the same type of hairs covering the whole surface 13
13a. Basal lateral veins up to 1/3 the length of the lamina; stipules yellowish sericeous . . . . . **18c F. hirta** subsp. **ochracea**
b. Basal lateral veins up to 1/3–2/3 the length of the lamina; stipules whitish to yellowish or brownish sericeous or strigose 14
14a. Stipules whitish to yellowish sericeous; basal lateral veins branched . . . . . **13. F. fulva**
b. Stipules brown sericeous or strigose; basal lateral veins usually unbranched . . . . . **29. F. aurata**
15a. Stipules only ciliolate, with a tuft of hairs at the apex or entirely glabrous . . 16
b. Stipules hairy outside, at least on the keel 19
16a. Stipules with a small tuft of hairs at the apex . . . . . **25. F. schefferiana**
b. Stipules without a tuft of hairs at the apex 17
17a. Epidermis of the petiole persistent . . . . . **8. F. oleifolia**
b. Epidermis of the petiole flaking off 18
18a. Lamina hairy and the reticulum prominent beneath, the midrib not furcate . . . . . **14. F. glabristipulata**
b. Lamina (almost) glabrous and the reticulum flat beneath, the midrib often not reaching the apex of the lamina . . . . . **2. F. deltoidea**
19a. Waxy glandular spots in pairs at the base of the petiole . . . . **15. F. glandulifera**
b. Waxy glandular spots absent at the base of the petiole 20
20a. Indumentum of leafy twigs brown(ish) . . . . . **13. F. fulva**
b. Indumentum of the leafy twigs whitish or yellowish, often sparse 21
21a. Lateral veins (7–)10–13(–18) pairs, the basal lateral veins hardly or not different from the other lateral veins . . . . . **19. F. lamponga**
b. Lateral veins 4–8(–9) pairs, the basal lateral veins ± clearly different from the other lateral veins . . . . . **20. F. litseifolia**

REGIONAL KEY: JAVA

1a. Lower surface of the lamina with hairs in the areoles 2
b. Lower surface of the lamina with hairs (almost) confined to the veins and veinlets or glabrous 4
2a. Stipules 2–5 cm long; figs in the leaf axils, the receptacle 2–3.5 cm diam. when dry . . . . . **23. F. padana**
b. Stipules 0.5–1.8 cm long; figs mostly below the leaves, the receptacle 0.5–1.8 cm diam. when dry 3
3a. Lamina with entire (or crenate) margin, usually smooth above, (sub)coriaceous . . . . . **27. F. tricolor**
b. Lamina with dentate to denticulate margin, usually scabrous to scabridulous above, chartaceous to subcoriaceous . . . . . **16. F. grossulariodes**
4a. Margin of the lamina dentate, denticulate or crenate 5

b. Margin of the lamina entire or subentire (sometimes sinuate to sublobate) . . . 9
5a. Stipules only ciliolate or, if hairy outside, then sparsely white puberulous on the keel; lamina 3–7-lobed to -fid also on fertile branches; fig receptacle usually (sub)pyriform and at least 1.5 cm diam. when dry; introduced, fruit tree . . . . . **1. F. carica**
b. Stipules densely hairy or, if sparsely, then at least with some brownish stiff hairs on the keel; lamina 3–7-lobed to -fid usually only on sterile branches; fig receptacle not pyriform or, if subpyriform, then less than 1.5 cm diam. when dry . . 6
6a. Waxy glands in pairs, laterally at the base of the petiole 7
b. Waxy glands lacking at the base of the petiole, or if present, then inconspicuously and median at the base of the petiole 8
7a. Stipules 0.4–0.8 cm long, usually brown hairy; fig receptacle 0.7–1 cm diam. when dry . . . . . **15. F. glandulifera**
b. Stipules 0.8–3.2 cm long, usually whitish to yellowish hairy; fig receptacle 1–1.6(–2) cm diam. when dry . . . . . **13. F. fulva**
8a. Stipules with stiff hairs only on the keel . . . . . **18. F. hirta**
b. Stipules with hairs covering the whole surface . . . . . **13. F. fulva**
9a. Stipules only ciliolate or entirely glabrous 10
b. Stipules hairy outside, at least on the keel 11
10a. Epidermis of the petiole flaking off; base of the lamina cuneate **2. F. deltoidea**
b. Epidermis of the petiole persistent; base of the lamina rounded to cordate; introduced, ornamental shrub or treelet . . . . . **4. F. erecta**
11a. Stipules 0.4–0.8 cm long, usually brown hairy; fig receptacle 0.7–1 cm diam. when dry . . . . . **15. F. glandulifera**
b. Stipules 0.8–3.2 cm long, usually whitish to yellowish hairy; fig receptacle 1–1.6(–2) cm diam. when dry . . . . . **13. F. fulva**

REGIONAL KEY: LESSER SUNDA ISLANDS

1a. Lamina cordiform to ovate in outline, usually lobed to parted; indumentum whitish; fig receptacle 1.5–4 cm diam. when dry; introduced, fruit tree . **1. F. carica**
b. Lamina elliptic to obovate to oblong to suborbicular, usually only lobed to parted when juvenile; indumentum on most parts brownish to yellowish; fig receptacle usually 1–1.5 cm diam. when dry . . . . . **13. F. fulva**

REGIONAL KEY: BORNEO

1a. Lower surface of the lamina with hairs in the areoles 2
b. Lower surface of the lamina with hairs (almost) confined to the veins and veinlets or glabrous 6
2a. Densely felted-tomentose or -villous in the areoles, this indumentum covering at least the lesser vein reticulations 3
b. Densely puberulous in the areoles as well as on the venation and there intermixed with longer stiff brownish hairs 4

3a. Lamina with entire (or crenate) margin, usually smooth above, (sub)coriaceous . . . . . **27. F. tricolor**
b. Lamina with dentate to denticulate margin, usually scabrous to scabridulous above, chartaceous to subcoriaceous . . . . . **16. F. grossulariodes**
4a. Leafy twigs hollow; fig receptacle when dry 2–3 cm diam. when dry . . . . . **32. F. bruneiensis**
b. Leafy twigs solid; fig receptacle 1–1.8 cm diam. when dry 5
5a. Stipules 1–3.5 cm long, appressed-puberulous to sericeous and on the keel also longer and stiff hairs; fig receptacle predominantly whitish puberulous . . . . . **33. F. brunneoaurata**
b. Stipules 0.5–1(–1.5) cm long, hirtellous to substrigose with one type of hairs; fig receptacle densely brown hirtellous to subvelutinous . . . . . **36. F. eumorpha**
6a. Margin of the lamina dentate, denticulate or crenate 7
b. Margin of the lamina entire or subentire (sometimes sinuate to sublobate) . . 25
7a. Stipules only ciliolate or, if hairy outside, then sparsely white puberulous on the keel; lamina 3–7-lobed to -fid also on fertile branches; fig receptacle usually (sub)pyriform and at least 1.5 cm diam. when dry; introduced fruit tree . . . . . **1. F. carica**
b. Stipules densely hairy or, if sparsely, then at least with some brownish stiff hairs on the keel; lamina 3–7-lobed to -fid usually only on sterile branches; fig receptacle not pyriform or, if subpyriform, then less than 1.5 cm diam. when dry . . 8
8a. Waxy glands in pairs, laterally at the base of the petiole 9
b. Waxy glands lacking at the base of the petiole, or if present, then inconspicuously and median at the base of the petiole 12
9a. Lamina about as long as broad . . . . . **35. F. endospermifolia**
b. Lamina distinctly longer than broad 10
10a. Stipules 0.8–3.2 cm long . . . . . **13. F. fulva**
b. Stipules 0.4–0.8 cm long 11
11a. Lamina ± scabrous above; basal lateral veins up to 1/4–1/3 the length of the lamina . . . . . **40. F. subglabritepala**
b. Lamina smooth above; basal lateral veins up to 1/3–1/2 the length of the lamina . . . . . **13. F. glandulifera**
12a. Stipules up to 1 cm long and/or petioles 1–4 cm long 13
b. Stipules mostly longer than 1 cm and/or petioles mostly longer than 4 cm . . 18
13a. Stipules white hairy (subsericeous) . . . . . **38. F. macilenta**
b. Stipules brown or brownish hairy 14
14a. Basal lateral veins up to 1/2–2/3 the length of the lamina 15
b. Basal lateral veins up to 1/2 the length of the lamina; epidermis of the petiole persistent 16
15a. Epidermis of the petiole flaking off; figs pedunculate . . . . . **26. F. subfulva**
b. Epidermis of petiole persistent; figs sessile . . . . . **31. F. auricoma**
16a. Basal lateral veins up to 1/4–1/3 the length of the lamina . . . . . **37. F. inaequipetiolata**
b. Basal lateral veins up to 1/3–1/2 the length of the lamina 17

17a. Fig receptacle at least 1 cm diam. when dry, hirtellous to hirsute or to subhispidulous . . . . . **29. F. aurata**
b. Fig receptacle up to 1 cm diam. when dry, appressed-puberulous **39. F. setiflora**
18a. Lamina smooth above 19
b. Lamina scabrous to scabridulous above 22
19a. Lamina cordiform to ovate . . . . . **30. F. aureocordata**
b. Lamina elliptic to oblong to subobovate or subpandurate 20
20a. Epidermis of the petiole flaking off; fig peduncle 0.4–1 cm long; stipules brown appressed-puberulous to subsericeous . . . . . **26. F. subfulva**
b. Epidermis of the petiole persistent; figs sessile or with a peduncle up to 0.5 cm long; stipules whitish sericeous (to yellowish subsericeous) or brown hirsute 21
21a. Basal bracts of the fig 4–5 mm long, yellow appressed-puberulous; petiole varying in length from 2 to 4.5 cm and stipules c. 1 cm long . . . . . **31. F. auricoma**
b. Basal bracts of the figs 2–3.5 mm long, shortly white sericeous; petiole varying in length from 1 to 14 cm and stipules varying in length from 0.8 to 3.2 cm . . . . . **13. F. fulva**
22a. Lamina cordiform to ovate . . . . . **30. F. aureocordata**
b. Lamina elliptic to oblong to (sub)obovate to pandurate 23
23a. Basal lateral veins unbranched or faintly branched . . . . . **29. F. aurata**
b. Basal lateral veins clearly branched 24
24a. Stipules with white to yellow hairs; figs sessile or up to 0.5 cm long pedunculate . . . . . **13. F. fulva**
b. Stipules with brown hairs; figs 0.4–1 cm long pedunculate . . . . **26. F. subfulva**
25a. Stipules only ciliolate or entirely glabrous 26
b. Stipules hairy outside, at least on the keel 29
26a. Epidermis of the petiole flaking off . . . . . **2. F. deltoidea**
b. Epidermis of the petiole persistent 27
27a. Lamina coriaceous, the apex acuminate to obtuse to rounded, the tertiary venation largely parallel to the lateral veins to reticulate . . . . . **8. F. oleifolia**
b. Lamina chartaceous (to subcoriaceous), the apex acuminate to subcaudate, the tertiary venation loosely scalariform 28
28a. Lamina with cystoliths (in dry material visible as minute pustules) beneath; fig receptacle 1.2–1.8 cm diam. when dry, the peduncle 0.5–2(–3) cm long; introduced, ornamental shrub or treelet . . . . . **4. F. erecta**
b. Lamina without cystoliths; fig receptacle 0.4–0.8 cm diam. when dry, the peduncle 0.1–0.4 cm long or the fig sessile . . . . . **12. F. chartacea**
29a. Waxy glandular spots in pairs at the base of the petiole . . . . **15. F. glandulifera**
b. Waxy glands absent at the base of the petiole 30
30a. Epidermis of the petiole persistent . . . . . **13. F. fulva**
b. Epidermis of the petiole flaking off 31
31a. Midrib of the lamina not reaching the apex of the lamina . . . . . **2. F. deltoidea**
b. Midrib reaching the apex of the lamina 32
32a. Basal lateral veins unbranched; stipules with yellowish hairs **28. F. androchaete**
b. Basal lateral veins branched; stipules with brown hairs . . . . . **26. F. subfulva**

REGIONAL KEY: PHILIPPINES

1a. Margin of the lamina dentate, denticulate or crenate 2
b. Margin of the lamina entire or subentire (sometimes sinuate to sublobate) . . . 4
2a. Stipules only ciliolate or, if hairy outside, then sparsely white puberulous on the keel; lamina 3–7-lobed to -fid also on fertile branches; fig receptacle usually (sub)pyriform and at least 1.5 cm diam. when dry; introduced, fruit tree . . . . . **1. F. carica**
b. Stipules densely hairy or, if sparsely, then at least with some brownish stiff hairs on the keel; lamina 3–7-lobed to -fid usually only on sterile branches; fig receptacle not pyriform or, if subpyriform, then less than 1.5 cm diam. when dry . . 3
3a. Waxy glands in pairs, laterally at the base of the petiole; figs 0.3–1.3 cm long pedunculate . . . . . **15. F. glandulifera**
b. Waxy glands lacking at the base of the petiole; figs sessile or up 0.4 cm long pedunculate . . . . . **29. F. aurata**
4a. Stipules only ciliolate or entirely glabrous 5
b. Stipules hairy outside, at least on the keel 9
5a. Fig receptacle with papillate on the surface . . . . . **10. F. pustulata**
b. Fig receptacle without papillae on the surface 6
6a. Upper surface of lamina ± scabrous; stipules subpersistent . . . . . **5. F. glareosa**
b. Upper surface of lamina smooth (or scabridulous); stipules caducous (or subpersistent) 7
7a. Epidermis of the petiole flaking off . . . . . **3. F. edanoi**
b. Epidermis of the petiole persistent 8
8a. Lamina coriaceous, the apex acuminate to obtuse to rounded, the tertiary venation largely parallel to the lateral veins to reticulate . . . . . **8. F. oleifolia**
b. Lamina chartaceous (to subcoriaceous), the apex acuminate to subcaudate, the tertiary venation loosely scalariform; introduced, ornamental plant . **4. F. erecta**
9a. Waxy glandular spots in pairs at the base of the petiole . . . . **15. F. glandulifera**
b. Waxy glands absent at the base of the petiole 10
10a. Periderm of the leafy twigs and epidermis of the petiole persistent . . . . . **24. F. ruficaulis**
b. Periderm of the leafy twigs and/or the epidermis of the petiole flaking off . . 11
11a. Midrib of the lamina not reaching the apex of the lamina . . **9. F. pedunculosa**
b. Midrib reaching the apex of the lamina 12
12a. Stipules 0.8–1.2 cm long; fig receptacle (sub)glabrous . . . . **11. F. banahaensis**
b. Stipules 1.2–2 cm long; fig receptacle hairy . . . . . **24. F. ruficaulis**

REGIONAL KEY: CELEBES

1a. Lower surface of the lamina with hairs in the areoles . . . . . **27. F. tricolor**
b. Lower surface of the lamina with hairs (almost) confined to the veins and veinlets or glabrous 2
2a. Margin of the lamina dentate, denticulate or crenate 3
b. Margin of the lamina entire or subentire (sometimes sinuate to sublobate) . . . 5

3a. Stipules only ciliolate or, if hairy outside, then sparsely white puberulous on the keel; lamina 3–7-lobed to -fid also on fertile branches; fig receptacle usually (sub)pyriform 1.5–4 cm diam. when dry; introduced, fruit tree . . . . . **1. F. carica**
b. Stipules densely hairy; lamina 3–7-lobed to -fid usually only on sterile branches; fig receptacle subglobose to ellipsoid, usually 1–1.5 cm diam. when dry 4
4a. Stipules 0.4–0.8 cm long, usually brown hairy; fig receptacle 0.7–1 cm diam. when dry . . . . . **15. F. glandulifera**
b. Stipules 0.8–3.2 cm long, usually whitish to yellowish hairy; fig receptacle 1–1.6 (–2) cm diam. when dry . . . . . **13. F. fulva**
5a. Stipules only ciliolate or entirely glabrous 6
b. Stipules hairy outside, at least on the keel 8
6a. Epidermis of the petiole flaking off . . . . . **2. F. deltoidea**
b. Epidermis of the petiole persistent 7
7a. Stipules subpersistent; lateral veins mostly 9–15 pairs . . . . . **7. F. kofmaniae**
b. Stipules caducous; lateral veins mostly 4–8 pairs . . . . . **8. F. oleifolia**
8a. Waxy glandular spots in pairs at the base of the petiole . . . . . **15. F. glandulifera**
b. Waxy glands absent at the base of the petiole 9
9a. Midrib of the lamina not reaching the apex of the lamina . . . . **9. F. pedunculosa**
b. Midrib reaching the apex of the lamina . . . . . **24. F. ruficaulis**

REGIONAL KEY: MOLUCCAS

1a. Lower surface of the lamina with hairs in the areoles . . . . . **27. F. tricolor**
b. Lower surface of the lamina with hairs (almost) confined to the veins and veinlets or glabrous 2
2a. Margin of the lamina dentate, denticulate or crenate 3
b. Margin of the lamina entire or subentire (sometimes sinuate to sublobate) 5
3a. Stipules only ciliolate or, if hairy outside, then sparsely white puberulous on the keel; lamina 3–7-lobed to -fid also on fertile branches; fig receptacle usually (sub)pyriform 1.5–4 cm diam. when dry; introduced, fruit tree . . . . . **1. F. carica**
b. Stipules densely hairy; lamina 3–7-lobed to -fid usually only on sterile branches; fig receptacle subglobose to ellipsoid, usually 1–1.5 cm diam. when dry 4
4a. Waxy glandular spots in pairs at the base of the petiole; lamina mostly elliptic to oblong to obovate, ovate, or lanceolate . . . . . **15. F. glandulifera**
b. Waxy glands absent at the base of the petiole; lamina cordiform . . . . . **17. F. halmaherae**
5a. Stipules brown sericeous . . . . . **9. F. pedunculosa**
b. Stipules white ciliolate or glabrous . . . . . **2. F. deltoidea**

REGIONAL KEY: NEW GUINEA

1a. Lamina palmately lobed to parted; introduced, fruit tree . . . . . **1. F. carica**
b. Lamina entire 2
2a. Midrib reaching the apex of the lamina; waxy glands at the base of the petiole . . . . . **15. F. glandulifera**

b. Midrib not reaching the apex of the lamina; waxy glands in the axils of the basal lateral veins beneath . . . . . **9. F. pedunculosa**

Section Ficus

Ficus L. subg. *Ficus* sect. *Ficus*: Corner, Gard. Bull. Singapore 17 (1960) 417. — *Ficus* L. sect. *Carica* Miq., Ann. Sci. Nat. Bot., Sér. 3, 1 (1844) 32; Endl., Gen. Pl., Suppl. 4, 2 (1847) 35; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 284. — *Ficus* L. sect. *Caricoides* Miq., London J. Bot. 7 (1848) 222. — *Ficus* L. sect. *Caprificus* (Gasp.) Miq., London J. Bot. 7 (1848) 223. — *Ficus* L. sect. *Eusyce* (Miq.) Benth. & Hook.f., Gen. Pl. 3 (1880) 369; King, Sp. Ficus 1 (1887) 1; 2 (1888) 97. — *Ficus* L. subg. *Carica* (Miq.) Mildbr. & Burret, Bot. Jahrb. Syst. 46 (1911) 175.

Shrubs or small trees with the indumentum usually whitish. *Lamina* with cystoliths only beneath or also above. *Figs* mostly in the leaf axils, often solitary, mostly pedunculate. *Staminate flowers* mostly scattered, in some species near the ostiole. *Stamens* 2–4. *Fruits* smooth.

Distribution — The section comprises c. 28 species, most of them associated with the Sino-Himalayan region, some extending to NE Africa, the Mediterranean, Korea, or Japan, some confined to Taiwan or the Philippines; a group of three species is centred in western Malesia.

Pollinators — The pollinators of this section belong to *Blastophaga* subg. *Blastophaga* (Wiebes, The Indo-Australian Aganoninae (pollinators of figs), 1994).

Subdivision — Section *Ficus* can be subdivided into two subsections: *Ficus* and *Frutescentiae*.

Section Ficus subsection Ficus

Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Ficus*: Corner, Gard. Bull. Singapore 17 (1960) 417. — *Ficus* L. subsect. *Eucarica* Miq., Ann. Sci. Nat. Bot., Sér. 3, 1 (1844) 32. — *Ficus* L. subg. *Ficus* sect. *Ficus* subsect. *Ficus* ser. *Cariceae* Corner, Gard. Bull. Singapore 17 (1960) 418.

Shrubs or small trees. *Lamina* cordate to ovate and palmately lobed to fid, chartaceous to subcoriaceous. *Staminate flowers* mostly near the ostiole. *Stamens* 2–4. *Tepals* of pistillate flowers white or reddish, thin. *Fruits* lenticular, smooth.

Distribution — This subsection comprises three species. *Ficus carica* and *F. palmata* Forssk. are very closely related, if not conspecific (as they share the same species of *Blastophaga* as pollinator) and range from Afghanistan and N India to the Mediterranean and Ethiopia, respectively. The third species, *F. iidaiana* Wilson, is from Bonin Island.

1. Ficus carica L.

Ficus carica L., Sp. Pl. (1753) 1059; Condit, Chronica Bot. Co (1948) 1; Hilgardia 23 (1955) 323 (varieties of *F. carica*); Condit & Enderud, Hilgardia 25 (1956) 1; Anonymous, Wealth of India 4 (1956) 26; Corner, Gard. Bull. Singapore 21 (1965) 36.

Tree up to 10 m tall. *Leafy twigs* 4–7 mm thick, puberulous to subtomentose; periderm persistent. *Leaves* spirally arranged; lamina cordiform to ovate and palmately

3–7(–11)-lobed to -fid, (4–)10–20(–35) by (4–)10–20(–35) cm, subcoriaceous, apex rounded to obtuse, base cordate to truncate, margin dentate to crenate to subentire; upper surface hispidulous (to subglabrous), ± scabrous (to smooth), lower surface hirtellous to subtomentose on the veins; cystoliths only beneath; lateral veins 6–12 pairs, the basal pair up 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 c. 3 mm diam., ± prominent; internal hairs abundant, short.

Distribution — Mediterranean to Afghanistan, widely cultivated under subtropical conditions.

Section Ficus subsection Frutescentiae

Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Frutescentiae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 332, 385. — *Ficus* L. sect. *Eusyce* (Miq.) Benth. & Hook.f. subsect. *Frutescentiae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 332, 385.

Erythrogyne Vis. ex Gasp., Giorn. Bot. Ital. 2 (1844) 219; Rendiconti Reale Accad. Sci. Fis. 25 (1845) 86; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 348. — *Ficus* L. sect. *Erythrogyne* (Vis. ex Gasp.) Endl., Gen. Pl., Suppl. 4, 2 (1847) 34; Miq., London J. Bot. 7 (1848) 453. — *Ficus* L. subg. *Erythrogyne* (Vis. ex Gasp.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 289. — *Ficus* L. subg. *Ficus* sect. *Ficus* subsect. *Ficus* ser. *Erythrogyneae* Corner, Gard. Bull. Singapore 17 (1960) 418.

Ficus L. sect. *Podosycea* Miq., London J. Bot. 7 (1848) 442; Fl. Ind. Bat. 1, 2 (1859) 316; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294. — *Ficus* L. subg. *Ficus* sect. *Ficus* subsect. *Ficus* ser. *Podosyceae* Corner, Gard. Bull. Singapore 17 (1960) 418. — *Ficus* L. subg. *Ficus* sect. *Ficus* subsect. *Ficus* ser. *Podosyceae* Corner subser. *Podosyceae* Corner, Gard. Bull. Singapore 17 (1960) 419.

Ficus L. sect. *Thamnosycea* Miq., London J. Bot. 7 (1848) 453.

Ficus L. sect. *Didymophora* Miq., London J. Bot. 7 (1848) 454.

Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Ficus* ser. *Podosyceae* Corner subser. *Basitepalae* Corner, Gard. Bull. Singapore 17 (1960) 419.

Shrubs or treelets, often the branches with internodes proximally long, becoming gradually shorter distally, and, therefore, the leaves ± tufted at the end of the branches. *Lamina* coriaceous to subcoriaceous. *Figs* axillary, often solitary, pedunculate. *Staminate flowers* mostly scattered or near the ostiole; stamens 2 or 3. *Tepals* of the pistillate flowers dark red, thick, ciliolate or with 1 or 2 hairs at the apex. *Fruits* lenticular to reniform, smooth.

Distribution — The subsection extends from NE India to Korea, Japan and Taiwan, and to Malesia. The majority of the c. 25 are elements of the Sino-Himalayan region.

Subdivision — Two groups of species can be recognized:

a. *Ficus deltoidea*-group (series *Erythrogyneae* Corner), centred in the western Malesian region and with three species, *F. deltoidea*, *F. kofmaniae*, and *F. oleifolia*. The *Terminalia* mode of branching is not clearly present, except in *F. kofmaniae*. These species can be epiphytic or epilithic and are as terrestrial plants often found on nutrient-poor substrates (like sandy soils). The midrib of the lamina is often

furcate in *F. deltoidea* and *F. oleifolia*. The 'seed-figs' contain few fruits (or in *F. oleifolia*, sometimes only one fruit). The fruits are reniform and 3–4 mm long, thus, relatively large in remarkable contrast with the size of the figs.

b. *Ficus pedunculosa*-group (series *Podosyceae* Corner) with c. 22 species. It is distinctly associated with the Sino-Himalayan region, 5 of them extending to (or confined to) the western Malesian region (Malay Peninsula, Philippines, and the widespread *F. pedunculosa* even extending to Celebes, the Moluccas, and New Guinea). This group exhibits more or less pronouncedly the *Terminalia* mode of branching, with the first proximal internode(s) very short, the second (or third) long (and the nodes only with stipules) and the terminal ones much shorter, and, therefore, the leaves ± tufted. The uppermost internodes are very short and without leaves, but only subpersistent in a terminal tuft. The lower nodes bear only stipules, which are often not fully amplexicaul. In *F. ischnopoda* the stipules remain semi-amplexicaul to lateral also on the upper nodes of the twigs. Most of the species with these features are shrubs with streamsides or streambeds as typical habitats; some species are sometimes or often rheophytic.

2. Ficus deltoidea Jack

Ficus deltoidea Jack, Mal. Misc. 2 (1822) 71; Hook., Comp. Bot. Mag. 1 (1836) 222; Quisumb., Philipp. J. Sci. 76 (1944) 37; Merr., J. Arnold Arbor. 33 (1952) 225; Corner, Gard. Bull. Singapore 17 (1960) 420; 21 (1965) 37; Kochummen, Tree Fl. Malaya 3 (1978) 145; Tree Fl. Sabah & Sarawak 3 (2000) 254, 255, 269, t. 8. — *Ficus diversifolia* Blume var. *deltoidea* (Jack) Ridl., Fl. Malay Penins. 3 (1924) 346.

Shrub up to 3 m tall and epiphytic, epilithic or terrestrial or tree up to 7(–10) m tall and terrestrial. *Leafy twigs* 1–5 mm thick, glabrous, mostly greyish or pale brown; periderm persistent or flaking off. *Leaves* spirally arranged; lamina oblong to elliptic to obtriangular to oblanceolate to spathulate to linear or to suborbicular, 1–8(–25) by 0.5–8(–14) cm, (sub)coriaceous, usually drying greyish green to pale brown, apex acuminate to acute to rounded to emarginate (to bilobate), base (sub)acute, margin entire, often ± revolute; both surfaces glabrous (or sparsely minutely puberulous at the base of the midrib beneath); cystoliths only beneath; venation pinnate with (2–)3–8(–9) pairs of lateral veins (mostly departing the midrib in ± acute angles) and the basal pair ± distinct or with the midrib furcate at various distances from the basal pair of lateral veins (but mostly in the lower part or up to the middle of the lamina), tertiary venation reticulate, midrib in lamina with acuminate apex usually reaching the tip of the acumen; waxy glands in the axils of the basal lateral veins, sometimes also in the axils of other lateral veins, usually in the furcation of the midrib and sometimes in the furcations or axils of the two branches of the midrib, in total up to 9 glands; petiole 0.2–1.5(–9) cm long, 1–3 mm thick, glabrous or minutely puberulous, the epidermis flaking off; stipules 0.3–1(–1.5) cm long, only ciliolate, caducous (or subpersistent). *Figs* axillary, in pairs or solitary, with a peduncle up to 1.5(–3) cm long or subsessile; basal bracts 3, 0.5–3 mm long, ciliolate or also minutely puberulous outside; receptacle globose to ellipsoid to (sub)ovoid to oblongoid to fusiform or almost cylindrical, 0.4–0.8 cm diam. when dry, 0.4–1.5 cm diam. when fresh, glabrous, yellow to orange or red to dark purple (to

black) at maturity, apex convex to ± protracted (up to 0.7 cm long), ostiole 1.5–2.5 mm diam., prominent, the base of the receptacle sometimes cupulate; internal hairs present or absent. *Tepals* of the pistillate flowers fleshy.

Notes — 1. The species shows a perplexing and confusing variation in the leaves (dimensions, shape, venation, presence and distribution of waxy glands, length of the petiole) and in the syconia (dimensions, shape, colour at maturity, and length and diameter of the peduncle). In most specimens short hairs are confined to the margins of the stipules and (basal and ostiolar) bracts; in some they are confined to the petiole and the base of the midrib beneath. In part of the material only one type of leaves occurs and in another part two more or less distinct types occur, with or without gradual transitions from one type into the other. Also the flowers are quite variable, as in the length of the pedicels and the shape of the 'gall-fruits'. Moreover, the species varies in habit from small shrubs to treelets, and in life form from terrestrial to epiphytic or epilithic. Some of the variation can be related to habitat or (but usually not very clearly) to distribution.

2. Corner (1960) recognized numerous varieties, some of them with two or more forms. Even this elaborate subdivision of the species does not fully comply with the variation, partly as some of the infraspecific subdivisions are again quite variable, partly as some of the variation is gradual rather than abrupt. It seems to be more practical and satisfactory to handle the variation by subdividing the species into two major morphological entities: subsp. *deltoidea* and subsp. *motleyana*. As strong phytogeographical and ecological support is lacking, the rank of variety might be more correct, but the chosen rank allows recognition of varieties for regional use.

KEY TO THE SUBSPECIES

1a. Lamina of all or some of the leaves with a furcate midrib . . . **a.** subsp. **deltoidea**
b. Lamina of all leaves pinnately veined and the midrib not furcate . . . . . .
. . . . . **b.** subsp. **motleyana**

a. subsp. **deltoidea**

Ficus ovoidea Jack, Mal. Misc. 2 (1822) 71; Hook., Comp. Bot. Mag. 1 (1836) 222; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 251; Kuntze, Rev. Gen. Pl. 1 (1891) 627 (as var. *normalis*); Merr., J. Arnold Arbor. 33 (1952) 225. — *Urostigma ovoidum* (Jack) Miq., London J. Bot. 6 (1847) 581; Fl. Ind. Bat. 1, 2 (1859) 345. — *Ficus retusa* L. var. *ovoidea* (Jack) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 288. — *Ficus diversifolia* Blume var. *ovoidea* (Jack) King, Sp. Ficus 2 (1888) 140, t. 174D; Renner, Bot. Jahrb. Syst. 39 (1907) 402; Ridl., Fl. Malay Penins. 3 (1924) 346.

Ficus diversifolia Blume, Bijdr. (1825) 456; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 252; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268, 289; Solms, Bot. Zeit. 43 (1885) 518, 529 t. V, 11–21; King, Sp. Ficus 2 (1888) 139, t. 174, 175; Fl. Brit. India 5 (1888) 529; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 240; Koord., Exk. Fl. Java 4 (1924) t. 779; Ridl., Fl. Malay Penins. 3 (1924) 346; Steenis, Bull. Jard. Bot. Buitenzorg III, 13 (1933) 46; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1007; Pijl, Trop. Natuur 27 (1938) 86, t. 1–4; Corner, Wayside Trees (1940) 687; Backer & Bakh. f., Fl. Java 2 (1965) 28 (as *F. deltoidea* Jack). — *Synoecia diversifolia* (Blume) Miq., London J. Bot. 7 (1848) 470, t. ixB; Pl. Jungh. (1851) 67; Fl. Ind. Bat. 1, 2 (1859) 328; Fl. Ind. Bat., Suppl. (1861) 435; ? var. *latifolia* Kurz, Natuurk. Tijdschr. Ned-Indië 27 (1864) 184, incl. 3 vars.

Ficus lutescens Desf., Cat. Hort. Paris, ed. 3 (1829) 413; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 251; Miq., London J. Bot. 7 (1848) 453. — *Erythrogyne lutescens* (Desf.) Vis. ex Gasp., Giorn. Bot. Ital. 2 (1844) 219; Gasp., Rendiconti Reale Accad. Sci. Fis. 25 (1845) 86; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 348; Ric. Caprif. (1845) 86. — *Ficus diversifolia* Blume var. *lutescens* (Desf.) King, Sp. Ficus 2 (1888) 140; Renner, Bot. Jahrb. Syst. 39 (1907) 402; Merr., Enum. Born. (1921) 223. — *Ficus ovoidea* Jack var. *lutescens* (Desf.) Kuntze, Rev. Gen. Pl. 1 (1891) 627. — *Ficus deltoidea* Jack var. *lutescens* (Desf.) Corner, Gard. Bull. Singapore 17 (1960) 423.

Ficus spathulata Miq., London J. Bot. 7 (1848) 441.

Synoecia diversifolia (Blume) Miq. forma *angustifolia* Miq., Pl. Jungh. (1851) 67; Fl. Ind. Bat. 1, 2 (1859) 329. — *Synoecia diversifolia* (Blume) Miq. var. *angustifolia* (Miq.) Miq.; Fl. Ind. Bat., Suppl. (1861) 435. — *Ficus deltoidea* Jack var. *angustifolia* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 421.

Ficus sideroxylifolia Griff., Notul. 4 (1854) 389; Ic. Pl. Asiat. 4 (1854) t. 551, t. 2.

Ficus diversifolia Blume var. *latissima* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268.

Ficus diversifolia Blume var. *subsessilis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268.

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

Ficus deltoidea Jack var. *angustifolia* (Miq.) Corner forma *angustissima* Corner, Gard. Bull. Singapore 17 (1960) 421.

Ficus deltoidea Jack var. *arenaria* Corner, Gard. Bull. Singapore 17 (1960) 421.

Ficus deltoidea Jack var. *bilobata* Corner, Gard. Bull. Singapore 17 (1960) 422.

Ficus deltoidea Jack var. *borneensis* Corner, Gard. Bull. Singapore 17 (1960) 422.

Ficus deltoidea Jack var. *borneensis* Corner forma *subhirsuta* Corner, Gard. Bull. Singapore 17 (1960) 422.

Ficus deltoidea Jack var. *lutescens* (Desf.) Corner forma *longipedunculata* Corner, Gard. Bull. Singapore 17 (1960) 424.

Ficus deltoidea Jack var. *lutescens* (Desf.) Corner forma *subsessilis* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 424.

Ficus deltoidea Jack var. *peltata* Corner, Gard. Bull. Singapore 17 (1960) 424.

Ficus deltoidea Jack var. *trengganuensis* Corner, Gard. Bull. Singapore 17 (1960) 425.

Ficus deltoidea Jack var. *recurvata* Kochummen, Gard. Bull. Singapore 50 (1998) 213; Tree Fl. Sabah & Sarawak 3 (2000) 255.

Lamina obtriangular to suborbicular to obovate to subobovate to spathulate to oblanceolate to linear-oblanceolate with a rounded to truncate to bilobate apex and the midrib furcate mostly below, less often in or above the middle of the lamina, mostly with a waxy glandular spot in the furcation, in large leaves also waxy glands in the axils of branches or furcations of the diverging veins; sometimes on the same plant also the lamina pinnately veined; size, shape, and texture of the lamina, length and diameter of the petiole, length and diameter of the peduncle, and the shape and size of the fig receptacle very variable. — **Fig. 24.**

Distribution — Lower Thailand; in *Malesia*: Malay Peninsula, Sumatra, Java (western), Borneo, Moluccas.

Habitat & Ecology — Lowland and montane forest (epiphytic or terrestrial) at altitudes up to 1500(–2500) m, or thickets and scrub on sandy soil, on rocks, on seashore (as terrestrial or epilithic shrubs or treelets).

Note — Within this still very variable entity extremes of the variation can be distinguished:

a. *Lamina* narrow, oblanceolate to spathulate to linear-oblanceolate, relatively small, apex rounded to obtuse, with the furcation of the midrib usually above the middle

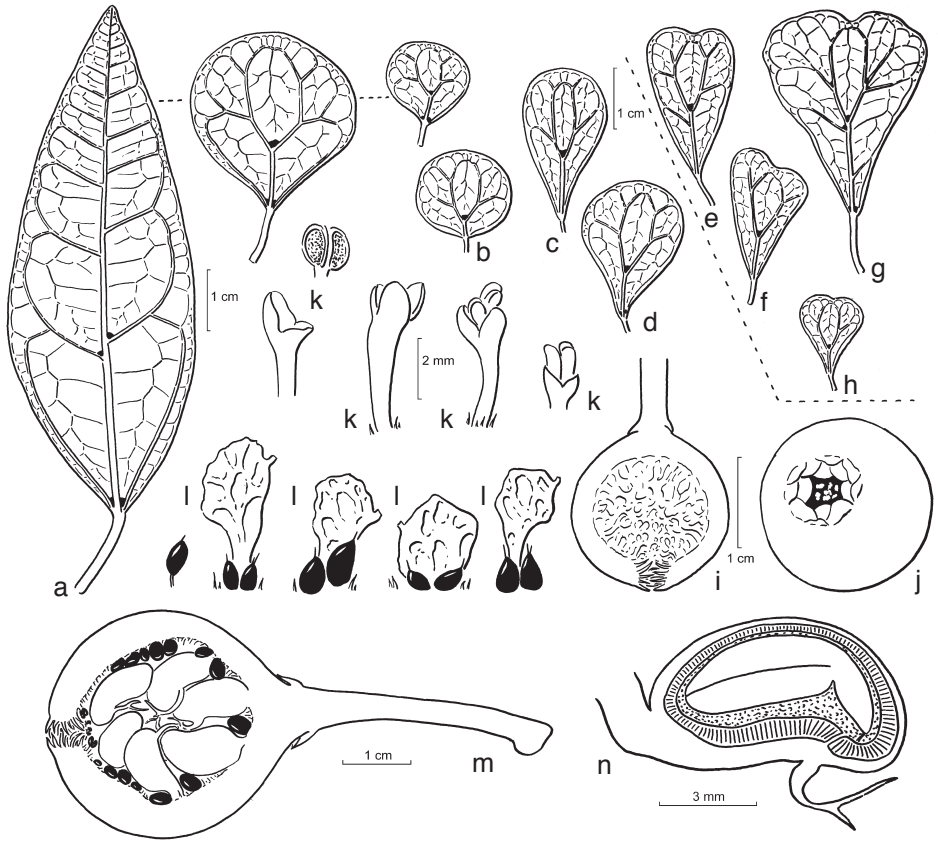


Fig. 24. *Ficus deltoidea* Jack subsp. *deltoidea*. a–h: Leaves; i. fig; j. ostiole; k. staminate flowers and separate stamen; l. short-styled flowers with 'gall-fruits' and separate tepal; m. 'seed-fig'; n. fruit, longitudinal section (a: *Nieuwenhuis s.n.*; b: *Amdjah 243*; c: *Mondi 76*; d: *Achmad 1210*; e, f: *Corner s.n.,* Pahang; g: *SF 21235*; h: *SF 2368*; i–l: *SF 33240*; m, n: *Corner s.n.*, Trengganu). From Philos. Trans., Ser. B, 256 (1969) 299, 311 p.p.

of the lamina; petiole up to 1 cm long. — var. *angustifolia* (Miq.) Corner — Lower Thailand; in *Malesia*: Malay Peninsula, Sumatra (incl. Riouw Archipelago), Borneo.

b. *Lamina* obtriangular to obovate, relatively large (up to 14 by 14 cm), apex obtuse to truncate, with the furcation of the midrib normally below the middle of the lamina, in addition to the waxy glands in the axils of the basal lateral veins and the furcation of the midrib often 2–6 in secondary furcations of the veins; petiole up to 9 cm long. — var. *kunstleri* (King) Corner — Lower Thailand; in *Malesia*: Malay Peninsula, Borneo.

c. *Lamina* either pinnately veined with an acute to subacuminate apex or obtriangular to obovate with an obtuse to truncate apex and the furcation of the midrib usually below the middle of the lamina mostly with a waxy gland in the furcation; petiole up to 2.5 cm long. — var. *lutescens* (Desf.) Corner — Sumatra, Java, Borneo.

d. *Lamina* obovate, apex rounded to truncate, midrib usually furcate above the middle of the lamina, usually only waxy glands in the axils of the basal lateral veins; petiole up to 1(–2) cm long. — var. *arenaria* Corner — Borneo. — Because of the absence of a waxy gland in the furcation of the midrib and the furcation of the midrib above the middle of the lamina, this form resembles *F. oleifolia* subsp. *intermedia*, from which it can be distinguished by the exfoliating epidermis of the petiole.

b. subsp. **motleyana** (Miq.) C.C. Berg

Ficus deltoidea Jack subsp. *motleyana* (Miq.) C.C. Berg, Blumea 48 (2003) 534. — *Ficus motleyana* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 228, 294; King, Sp. Ficus 2 (1888) 158, t. 202; Stapf, Trans. Linn. Soc. London, Bot. 4 (1894) 226; Merr., Enum. Born. (1921) 225. — *Ficus deltoidea* Jack var. *motleyana* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 424.
Urostigma oligoneuron Miq., Fl. Ind. Bat., Suppl. (1861) 438. — *Ficus oligoneura* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 289; King, Sp. Ficus 2 (1888) 140, t. 176. — *Ficus deltoidea* Jack var. *oligoneura* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 424.
Synoecia grandifolia Kurz, Natuurk. Tijdschr. Ned.-Indië 27 (1864) 184.
Ficus landonii Symington, J. Malayan Branch Roy. Asiat. Soc. 14 (1936) 359, t. 21.

Lamina oblong to lanceolate (or to elliptic) with (3–)5–10 pairs of lateral veins, waxy glands in the axils of the basal lateral veins or in large leaves also in the axils of other lateral veins; apex acuminate to subacute; petiole mostly relatively short, 0.2–1(–5) cm long, and thick. Fig peduncle relatively short and stout; receptacle mostly subovoid to subcylindrical.

Distribution — Malay Peninsula, Sumatra (incl. Billiton), Java, Borneo, Celebes.

Habitat & Ecology — Rocks (sandstone and limestone), sandy heath-forest and peat swamp-forest, at altitudes up to 1100 m. Not (or rarely?) epiphytic.

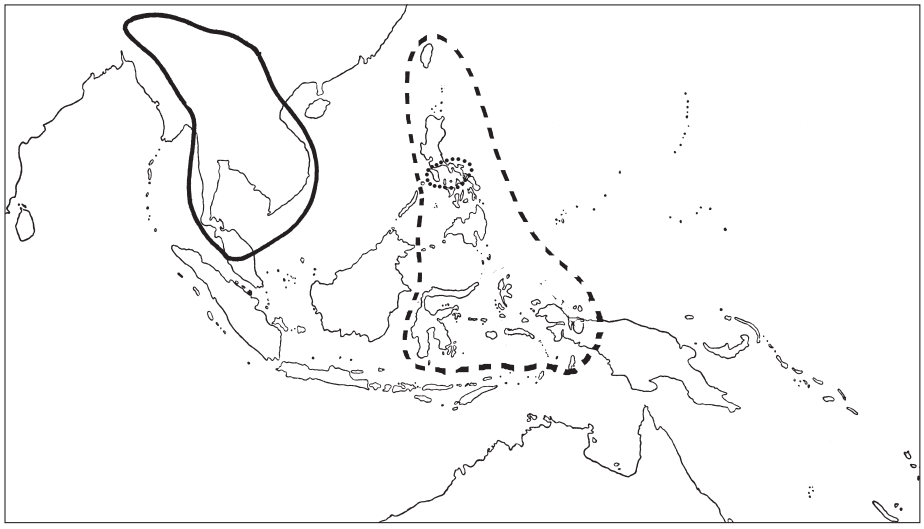
3. Ficus edanoi Merr.

Ficus edanoi Merr., Philipp. J. Sci. 18 (1921) 62; Enum. Philipp. Flow. Pl. 2 (1923) 51; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 352; Corner, Gard. Bull. Singapore 21 (1965) 43.

Shrub. *Leafy twigs* 2–2.5 mm thick, puberulous; periderm flaking off. *Leaves* spirally arranged; lamina oblong (to elliptic), 3.5–8.5 by 1–4 cm, subcoriaceous, apex obtuse to subacute, base cordulate-auriculate, margin entire to sinuate, ± revolute; upper surface glabrous, smooth, lower surface glabrous; cystoliths only beneath; midrib not reaching the (very) apex of the lamina, lateral veins (4–)5–8 pairs, departing at a wide angle, the basal pair ± different from the other lateral veins; tertiary venation reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.7–1 cm long, sparsely puberulous, the epidermis flaking off; stipules 0.3–0.8 cm long, ciliolate, caducous. *Figs* axillary, solitary; peduncle 0.7–1 cm long; basal bracts 3, 1–1.5 mm long, ciliolate; receptacle subglobose, 0.7–0.8 cm diam. when dry, glabrous, colour at maturity unknown, apex convex, ostiole 1.5–2 mm diam., prominent; internal hairs few and minute or absent. — **Map 1.**

Distribution — Philippines (Luzon).

Habitat — Coastal forest and on rocks near sea.



Map 1. Distribution of some species of subg. *Ficus* sect. *Ficus* subsect. *Frutescentiae*: *F. edanoi* Merr. (dotted line); *F. ischnopoda* Miq. (continuous line); *F. pedunculosa* Miq. (broken line).

4. **Ficus erecta** Thunb.

Ficus erecta Thunb., Ficus (1786) 9; Corner, Gard. Bull. Singapore 21 (1965) 40.

Shrub or treelet up to 5 m tall. *Leafy twigs* 2–6 mm thick, glabrous or sparsely white appressed-puberulous; periderm persistent. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)obovate, 5–18 by 1.5–8.5 cm, chartaceous, apex acuminate, base obtuse to (sub)cordate, margin entire; upper surface sparsely strigillose or glabrous, scabridulous or smooth, lower surface sparsely white appressed-puberulous on the main veins; cystoliths only beneath; lateral veins 4–9 pairs, the basal pair hardly different from the other lateral veins, tertiary venation loosely scalariform to almost reticulate; waxy glands in the axils of the basal lateral veins; petiole 1–3 cm long, glabrous, the epidermis persistent; stipules 0.7–1.6 cm long, glabrous, caducous. *Figs* axillary, solitary; peduncle 0.5–2(–3) cm long; basal bracts 3, 2–2.5 mm long, white appressed-puberulous at the base; receptacle (sub)pyriform or subglobose and often stipitate up to 1 cm, 1.2–1.8 cm diam. when dry, sparsely white appressed-puberulous, dark purple at maturity, apex convex, ostiole c. 3 mm diam., ± prominent, the outer ostiolar bracts erect; internal hairs absent or very sparse and minute.

Distribution — Japan, Korea, Ryukyu Islands, China, Taiwan; in *Malesia*: In cultivation as ornamental plant in Java and Borneo.

5. **Ficus glareosa** Elmer

Ficus glareosa Elmer, Leafl. Philipp. Bot. 4 (1912) 1393; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 53; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 356; Corner, Gard. Bull. Singapore 21 (1965) 44.

Ficus glareosa Elmer var. *oblanceolata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 356, 357.

Ficus glareosa Elmer var. *obpandurifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 356, 357.

Shrub up to 5 m tall, with internodes distinctly different in length and leaves ± tufted at the end of branches. *Leafy twigs* 3–4 mm thick, white hirtellous; periderm persistent. *Leaves* spirally arranged; lamina subobovate to subpandurate (to oblanceolate), (3–)6–21 by (1–)2–6 cm, subcoriaceous, rigid, apex acuminate to subacute, base cuneate to narrowly subcordate, margin entire; upper surface brownish to whitish hispidulous to hirtellous to strigillose, scabrous to scabridulous, lower surface hirtellous to hispid in the veins, scabrous to scabridulous; cystoliths only beneath; lateral veins 4–7(–11) pairs, the basal pair running close to the margin, up to 1/3–2/3 the length of the lamina, tertiary venation scalariform to reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.5–2.5 cm long, white to brownish hirtellous to puberulous, the epidermis persistent; stipules 0.6–1.2 cm long, ciliolate, very sparsely white appressed-puberulous, subpersistent. *Figs* axillary, in pairs or solitary, sessile or with a peduncle up to 0.7 cm long; basal bracts 3, 1–2 mm long, glabrous or hispidulous; receptacle subglobose, 1–1.2 cm diam. when dry, whitish to brownish hirtellous, red at maturity, apex convex, ostiole c. 3 mm diam., flat; internal hairs sparse, minute.

Distribution — Philippines (Palawan).

Habitat — Lowland and submontane forest, at altitudes up to 900 m.

6. Ficus ischnopoda Miq.

Ficus ischnopoda Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 229, 294; Kurz, Forest Fl. Burma 2 (1877) 456; Corner, Gard. Bull. Singapore 21 (1965) 42; Kochummen, Tree Fl. Malaya 3 (1978) 149. — *Ficus pyriformis* Hook. & Arn. var. *ischnopoda* (Miq.) King, Sp. Ficus 2 (1888) 158, t. 200; Fl. Brit. India 5 (1888) 533; Renner, Bot. Jahrb. Syst. 39 (1907) 404.

Ficus pyriformis Hook. & Arn. var. *angustifolia* Ridl., Fl. Malay Penins. 3 (1924) 349.

Ficus petelotii Merr., Univ. Calif. Publ. Bot. 13 (1926) 129.

Ficus delavayi Gagnep., Notul. Syst. (Paris) 4 (1927) 89.

Ficus langbianensis Gagnep., Notul. Syst. (Paris) 4 (1927) (p.p. Hahn 143; alt.p. = *F. variolosa* Lindl. ex Benth.); Gagnep., Fl. Indo-Chine 5 (1928) 787.

Ficus pedunculosa Miq. var. *velutina* Corner, Gard. Bull. Singapore 17 (1960) 427.

Ficus ischnopoda Miq. var. *subcylindrica* Corner, Gard. Bull. Singapore 17 (1960) 429.

Ficus pyriformis auct. non Hook. & Arn.: Ridl., Fl. Malay Penins. 3 (1924) 349; Corner, Wayside Trees (1940) 687.

Shrub up to 6 m tall, with internodes distinctly different in length and leaves ± tufted at the end of branches. *Leafy twigs* 1.5–2.5 mm thick, white puberulous or glabrous; periderm persistent. *Leaves* spirally arranged, sometimes subopposite or subverticillate; lamina linear-oblanceolate, 3–21 by 0.3–2 cm, (sub)coriaceous, apex subacute to acuminate, base cuneate to rounded, margin entire, ± revolute, at least at the base; both surfaces glabrous; cystoliths only beneath; lateral veins 7–20 pairs, the basal pair slightly or not distinct from the other lateral veins, tertiary venation almost reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.2–1.5 cm long, puberulous or glabrous; stipules 0.5–1 cm long, lateral to semi-amplexicaul, glabrous, caducous (or subpersistent). *Figs* axillary, solitary; peduncle 0.8–3.2 cm long; basal bracts 3,

1–2 mm long, sparsely puberulous; receptacle ellipsoid to subpyriform to subglobose to (sub)ovoid (to almost cylindrical), 1.5–2.3 cm diam. when dry, 2–3 cm diam. when fresh, sometimes up to 1 cm long stipitate, (sub)glabrous, pink to dark red and purple at maturity, apex ± protracted, ostiole 2–3 mm diam., often slightly sunken; internal hairs few, short. — **Map 1.**

Distribution — NE India, Bangladesh (Chittagong), Myanmar, China (Yunnan), Indochina, Thailand; in *Malesia*: Malay Peninsula.

Habitat & Ecology — Mostly rocky streambeds or along streams, mostly as rheophytes, at altitudes up to 1000 m.

Notes — 1. In (more) northern parts of the species range the lamina is often broader (to subobovate and to 6 cm broad) and chartaceous, the stipules often subpersistent, and the lamina sometimes densely hairy beneath.

2. The bases of the stipules can be rather broad and encircling more than half the circumference of the twigs, especially in the lower part of the branchlets (with relatively long internodes). At more distal parts (with shorter internodes), the leaves can be subopposite or subverticillate and the stipules usually have narrow bases and are clearly lateral.

7. Ficus kofmaniae C.C. Berg

Ficus kofmaniae C.C. Berg, Blumea 48 (2003) 540, as '*kofmanae*'.

Treelet (?). *Leafy twigs* 1.5–3 mm thick, brown puberulous; periderm flaking off. *Leaves* spirally arranged; lamina oblanceolate to subspathulate, (2.5–)7–15 by (1.2–)2–4.5 cm, coriaceous, apex acuminate, base cuneate to subattenuate, margin entire; both surfaces glabrous; lateral veins (6–)9–15 pairs, departing the midrib at acute angles, basal pair running close to the margin, tertiary venation reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.3–0.7 mm long, 1–2.5 mm thick, minutely puberulous, the epidermis persistent; stipules 1–1.3 cm long, glabrous, subpersistent. *Figs* axillary, in pairs or solitary; peduncle 0.7–1.2 cm long, minutely puberulous; basal bracts 3, c. 2 mm long, sparsely and minutely ciliolate; receptacle (sub)ovoid, 0.8–1.1 cm diam., glabrous, colour at maturity unknown, apex somewhat protracted, ostiole c. 2 mm diam., almost flat; internal hairs absent. *Tepals* glabrous.

Distribution — Celebes (central).

Habitat — Montane forest, at 2000–2500 m.

Notes — 1. This species shows affinities to *F. oleifolia*, in particular subsp. *intermedia*, from which it differs, e.g., in the subpersistent stipules and more numerous lateral veins.

2. A branch of the (single) type specimen has internodes clearly different in length, showing features of *Terminalia*-branching.

8. Ficus oleifolia King

Ficus oleifolia King, Sp. Ficus 2 (1888) 160, t. 204B; Corner, Gard. Bull. Singapore 21 (1965) 38; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 256, 293.
Ficus oleifolia King var. *major* King, Sp. Ficus 2 (1888) 160.

Shrub or (slender) treelet up to 6 m tall, sometimes subscandent, epiphytic or epilithic. *Leafy twigs* 1–4(–7) mm thick, glabrous, often dark purplish brown to blackish; periderm flaking off. *Leaves* spirally arranged; lamina oblong to lanceolate to oblanceolate to obovate, (1–)4.5–9(–18) by 0.5–3.5(–7.5) cm, coriaceous, usually drying brown, apex acuminate to subacute to obtuse to rounded, base cuneate to subattenuate, margin entire, ± revolute; both surfaces glabrous; cystoliths only beneath; lateral veins (3–)4–10(–15) pairs, often departing from the midrib in wide angles (up to 90°), or the midrib furcate in the upper part of the lamina if the apex is rounded, the basal pair ± distinct, tertiary venation largely parallel to the lateral veins to reticulate, midrib even in lamina with acuminate apex not reaching the tip of the acumen; waxy glands often absent, if present, then only on some leaves of a twig, 1 or 2, conspicuous, in the axils of the basal lateral veins or sometimes also (± inconspicuous) ones in the axils of other lateral veins; petiole 0.2–2(–3) cm long, 0.5–1 or 1.2–2(–2.5) mm thick, glabrous or minutely puberulous, the epidermis persistent; stipules 0.3–1.7 cm long, ciliolate or entirely glabrous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.1–1.6(–2) cm long; basal bracts 3, 1–2.5 mm long, ciliolate; receptacle subglobose to ellipsoid (to fusiform), 0.2–0.7 or 0.5–1.2 cm diam. when dry, up to 0.3 cm long stipitate or non-stipitate, glabrous or minutely puberulous, 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', 'seed-figs' with 1–c. 20 flowers. *Tepals* of the pistillate flowers often ± flesh, glabrous or hairy at the apex.

Notes — 1. This species shows similarities to *F. deltoidea* in the variation of leaves and figs, although the range of variation is more limited. Considerable variation is found in the dimensions, shape and venation of the lamina, the diameter of the petiole, and the dimensions and shape of the figs. Also ecologically the two species show strong similarities. The epiphytic life form appears to be less common in *F. oleifolia* than in *F. deltoidea*.

2. The morphological differentiation allows recognition of three subspecies: subsp. *monantha*, subsp. *oleifolia,* and subsp. *intermedia*.

KEY TO THE SUBSPECIES

1a. Petiole 1.5–2(–2.5) mm thick. — Malay Peninsula, Borneo **b.** subsp. **intermedia**
b. Petiole 0.5–1 mm thick 2
2a. Lamina spathulate to oblanceolate to linear-lanceolate, drying greenish; lateral veins departing in acute angles, the midrib repeatedly branched in laminas with rounded apices. — Philippines (Palawan) . . . . . **c.** subsp. **monantha**
b. Lamina oblong to subobovate to linear-oblanceolate, mostly drying brown; lateral veins departing in broad angles in the middle of the lamina, the midrib simply branched in laminas with rounded apices. — Sumatra, Borneo, Philippines, Celebes . . . . . **a.** subsp. **oleifolia**

a. subsp. **oleifolia**

Ficus williamsii C.B. Rob., Philipp. J. Sci., Bot. 3 (1908) 177; Elmer, Leafl. Philipp. Bot. 7 (1914) 2396; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 68; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 354.
Ficus williamsii C.B. Rob. var. *epiphytica* Elmer, Leafl. Philipp. Bot. 7 (1914). — *Ficus oleifolia* King var. *epiphytica* (Elmer) Corner, Gard. Bull. Singapore 17 (1960) 425.
Ficus dodonaeiformis Gagnep., Notul. Syst. (Paris) 4 (1927) 90.
Ficus oleifolia King var. *dodonaeiformis* (Gagnep.) Corner, Gard. Bull. Singapore 17 (1960) 425.
Ficus oleifolia King var. *memecylifolia* Corner, Gard. Bull. Singapore 17 (1960) 425.
Ficus oleifolia King var. *myrsinoides* Corner, Gard. Bull. Singapore 17 (1960) 425.
Ficus oleifolia King var. *riparia* Corner, Gard. Bull. Singapore 17 (1960) 426.
Ficus deltoidea Jack var. *subhirsuta* Kochummen, Gard. Bull. Singapore 50 (1998) 214; Tree Fl. Sabah & Sarawak 3 (2000) 254.
Ficus oleifolia King var. *calcicola* Kochummen, Gard. Bull. Singapore 50 (1998) 215.
Ficus oleifolia King var. *impressicostata* Kochummen, Gard. Bull. Singapore 50 (1998) 217.

Leafy twigs 1–3 mm thick. *Lamina* drying brown or greenish, oblong to subobovate to linear-oblanceolate, mostly up to 6 by 2 cm, sometimes up to 9 by 3 cm, rarely up to 13 by 3.5 cm; midrib reaching the apex of the lamina, or if not, then simply branched, lateral veins (3–)6–10(–15) pairs; petiole 0.5–1 mm thick; stipules 0.3–1 cm long. *Figs* relatively small, 0.2–0.7 cm diam. when dry, 'seed-figs' with 1–c. 5 flowers. — **Fig. 25.**

Distribution — Sumatra, Borneo, Philippines (Basilan and Mindanao), Celebes.

Habitat & Ecology — Mostly (sub)montane forest, often on rocky places, at altitudes between 1000 and 2300 m, also at lower altitudes and then often epilithic.

Fig. 25. *Ficus oleifolia* King subsp. *oleifolia*. Leafy twigs with figs, Sumatra, Gunung Sago, 1500 m. Photo W. Meijer.

Notes — 1. The material from Sumatra usually has elliptic to oblong laminas with subacuminate to subacute or obtuse apices, but the lamina is sometimes (sub)obovate with a rounded apex and with the midvein furcate. The latter type of lamina, although often narrower (to subspathulate or linear-oblanceolate), is more common in Borneo. Both types of lamina can be found on the same specimen.

2. Most collections from Celebes have relatively large figs, 0.5–1 cm diam., matching in size of those of subsp. *intermedia*. Moreover, the lamina often dries greenish.

b. subsp. **intermedia** (Corner) C.C. Berg

Ficus oleifolia King subsp. *intermedia* (Corner) C.C. Berg, Blumea 48 (2003) 541. — *Ficus deltoidea* Jack var. *intermedia* Corner, Gard. Bull. Singapore 17 (1960) 423.

Ficus kinabaluensis Stapf, Trans. Linn. Soc. London, Bot. 4 (1894) 226. — *Ficus deltoidea* Jack var. *kinabaluensis* (Stapf) Corner, Philos. Trans., Ser. B, 256 (1969) 305

Ficus burkillii Ridl., Gard. Bull. Str. Settl. 3 (1923) 73, nom. seminudum; Fl. Malay Penins. 3 (1924) 330.

Ficus motleyana auct. non Miq.: Ridl., Fl. Malay Penins. 5 (1924) 334.

Ficus diversifolia Blume var. *lutescens* auct. non Lindl. ex Benth.: Ridl., Fl. Malay Penins. 3 (1924) 349.

Leafy twigs 2–5(–7) mm thick. *Lamina* elliptic to oblong to (sub)obovate to broadly spathulate to oblanceolate to linear-oblanceolate, mostly up to 9 by 3 cm, sometimes up to 18 by 7.5 cm; lateral veins (3–)4–10(–15) pairs; petiole 1.2–2(–2.5) mm thick; stipules 0.6–1.7 cm long. *Figs* relatively large, 0.6–1.2 cm diam. when dry, 'seed-figs' with c. 5–20 flowers.

Distribution — Thailand; in *Malesia*: Malay Peninsula, Borneo.

Habitat & Ecology — Mostly (sub)montane forest, often in rocky places, at altitudes between (500–)1000 and 2400(–3200) m, also at lower altitudes and then often epilithic.

Notes — 1. This subspecies comprises material which has been recognized as a variety of *F. deltoidea*.

2. In Borneo this subspecies can be confused with one of the forms of *F. deltoidea*, but it can always be distinguished by the persistent epidermis of the petiole. In the Malay Peninsula the apex of the lamina is often rounded.

c. subsp. **monantha** Merr. & Quisumb. ex C.C. Berg

Ficus oleifolia King subsp. *monantha* Merr. & Quisumb. ex C.C. Berg, Blumea 48 (2003) 541.

Leafy twigs 1–2 mm thick. *Lamina* drying greenish, spathulate to oblanceolate to linear-lanceolate, 2.5–6 by 0.4–1.6 cm; midrib reaching the apex of the lamina, or if not, then (usually) repeatedly branched, lateral veins 4–9 pairs; petiole 0.5–1 mm thick; stipules 0.2–0.5 cm long. *Figs* small, 0.2–0.4 cm diam. when dry, 'seed-figs' with 1 flower.

Distribution — Philippines (Palawan; Brooke's Point).

Habitat & Ecology — Montane (mossy) forest, at altitudes of 1100–1400 m, terrestrial or epiphytic.

Note — This subspecies is only known from one locality,

9. **Ficus pedunculosa** Miq.

Ficus pedunculosa Miq., London J. Bot. 7 (1848) 442, t. 7, f. A; Fl. Ind. Bat. 1, 2 (1859) 316; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; Náves & Fern.-Vill., Nov. App. (1880) 201; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 252; King, Sp. Ficus 2 (1888) 145, t. 183; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 61; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 352; Corner, Gard. Bull. Singapore 21 (1965) 39.

Ficus ataktophylla Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 227, 294; King, Sp. Ficus 2 (1888) 145.

Ficus macropoda Miq., London J. Bot. 7 (1848) 442; Fl. Ind. Bat. 1, 2 (1859) 316; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; Náves & Fern.-Vill., Nov. App. (1880) 201; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 252; King, Sp. Ficus 2 (1888) 144, t. 182; Elmer, Leafl. Philipp. Bot. 1 (1906) 59; Renner, Bot. Jahrb. Syst. 39 (1907) 402; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 56; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 350. — *Ficus pedunculosa* Miq. var. *macropoda* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 426.

Ficus segaarensis Engl., Bot. Jahrb. Syst. 7 (1886) 453; Diels, Bot. Jahrb. Syst. 67 (1935) 229. — *Ficus pedunculosa* Miq. var. *segaarensis* (Engl.) Corner, Gard. Bull. Singapore 17 (1960) 427.

Ficus moseleyana King, Sp. Ficus 2 (1888) 144, t. 181.

Ficus luzonensis Merr., Publ. Gov. Lab. Philipp. 6 (1904) 8; Enum. Philipp. Flow. Pl. 2 (1923) 56; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 351.

Ficus mearnsii Merr., Philipp. J. Sci., Bot. 3 (1908) 402; Enum. Philipp. Flow. Pl. 2 (1923) 57; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 353, t. 53, f. 3. — *Ficus pedunculosa* Miq. var. *mearnsii* (Merr.) Corner, Gard. Bull. Singapore 17 (1960) 427.

Ficus luzonensis Merr. var. *imberbis* Elmer, Leafl. Philipp. Bot. 4 (1911) 1323; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 56. — *Ficus imberbis* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 351. — *Ficus pedunculosa* Miq. var. *imberbis* (Elmer) Corner, Gard. Bull. Singapore 17 (1960) 426.

Ficus garanbiensis Hayata, Ic. Pl. Formos. 8 (1919) 118, 119; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 35.

Ficus confertifolia Merr., Philipp. J. Sci. 18 (1921) 59; Enum. Philipp. Flow. Pl. 2 (1923) 50; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 353. — *Ficus pedunculosa* Miq. var. *confertifolia* (Merr.) Corner, Gard. Bull. Singapore 17 (1960) 426.

Ficus imberbis (Elmer) Sata var. *basiacuta* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 352.

Shrub or tree up to 8(–25) m tall, with internodes ± distinctly different in length and often leaves ± tufted at the end of branches. *Leafy twigs* 2–5 mm thick, whitish to brown puberulous to (sub)tomentose; periderm flaking off. *Leaves* spirally arranged; lamina oblong to subobovate, 3–15(–22) by 2–6(–14) cm, often slightly asymmetric, subcoriaceous to chartaceous, apex acute to rounded, base rounded to cuneate (or to subcordate to cordulate), margin entire, often revolute (towards the base); upper surface sparsely (to densely) tomentose to hirtellous (or hispidulous), smooth (or ± scabrous), lower surface very sparsely to densely tomentose to hirtellous on the veins or glabrous; cystoliths only beneath; lateral veins 5–11 pairs, the basal pair mostly running almost parallel to the margin, up to 1/4–1/2 the length of the lamina and departing from the midrib a few mm from the base, tertiary venation loosely scalariform to almost reticulate, midrib usually not reaching the (very) apex of the lamina; waxy glands in the axils of the basal lateral veins; petiole 1–3.5 cm long, subtomentose to hirtellous, the epidermis flaking off; stipules 0.3–1 cm long, brown (sub)sericeous, caducous. *Figs* axillary or just below the leaves, in pairs; peduncle 0.5–3 cm long; basal bracts 3, 1–2

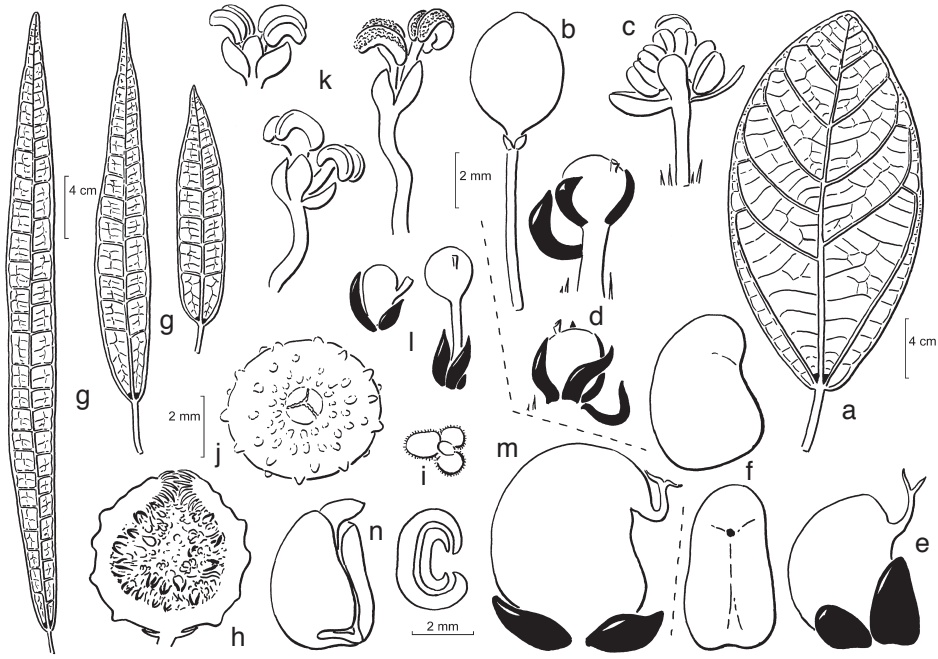


Fig. 26. a–f: *Ficus pedunculosa* Miq. a. Leaf; b. fig; c. staminate flower; d. short-styled flowers; e. long-styled flower; f. fruits. — g–n: *Ficus pustulata* Elmer. g. Leaves of narrow-leaved form; h. fig; i. basal bracts; j. ostiole; k. staminate flowers; l. short-styled flowers; m. long-styled flower in fruit; n. embryos (a–d: *Cuming 1941*; e, f: *PNH 17146*; g–l: *Elmer 12875*; m, n: *Elmer 12876*). From Philos. Trans., Ser. B, 256 (1969) 293.

mm long, appressed-puberulous; receptacle subglobose to ellipsoid, 0.8–1.3 cm diam. when dry, 1–1.5 cm diam. when fresh, 0–0.8 cm long stipitate, white puberulous to tomentose, orange at maturity, apex convex to ± protracted, ostiole c. 2 mm diam.; internal hairs abundant. — **Fig. 26a–f; Map 1.**

Distribution — Taiwan; in *Malesia*: Philippines, Celebes, Moluccas (Sula Islands, Buru, Ceram, Aru Islands), New Guinea (western).

Habitat — Forest, (swamp-)thicket, coastal vegetation, and secondary growth, at altitudes up to 2000 m.

Note — The species is rather variable in the denseness of the indumentum, the shape of the lamina, and the length of the stipes of the receptacle. One of the collections from the Philippines (*Lagrimas-Rojas et al. 41830*) is aberrant by having the basal bracts ± scattered along the peduncle (as usual in subg. *Sycidium*).

10. Ficus pustulata Elmer

Ficus pustulata Elmer, Leafl. Philipp. Bot. 4 (1912) 1389; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 63; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 316, 354; Corner, Gard. Bull. Singapore 21 (1965) 43, incl. vars.

Ficus cardinalicarpa Elmer, Leafl. Philipp. Bot. 4 (1912) 1391; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 47; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 355, 356. — *Ficus pustulata* Elmer var. *lanceifolia* (Sata) Corner, Gard. Bull. Singapore 17 (1960) 429.

Ficus pustulata Elmer var. *lobulata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 355.

Ficus pustulata Elmer var. *obovata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 355.

Ficus cardinalicarpa Elmer var. *lanceifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 356.

Ficus cardinalicarpa Elmer var. *linearifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 356.

Shrub up to 5 m tall, with internodes distinctly different in length and leaves ± tufted at the end of branches. *Leafy twigs* 1–2 mm thick, brownish puberulous to hirtellous to substrigillose; periderm flaking off or persistent. *Leaves* spirally arranged; lamina oblong to subobovate to subpandurate to linear, 4.5–11 by 1.5–4 cm, chartaceous to subcoriaceous, apex subacute to shortly acuminate, base cuneate to obtuse, margin entire (sometimes sinuate to weakly pinnately lobed), ± revolute at least at the base; both surfaces glabrous or sparsely puberulous at the base of the midrib beneath; cystoliths only beneath; lateral veins 4–6 pairs (or 7–25 if the lamina linear), the basal pair running close to the margin, up to 1/4–1/3 the length of the lamina, tertiary venation reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.2–1.5(–2.5) cm long, appressed-puberulous, the epidermis flaking off or persistent; stipules 0.5–1 cm long, glabrous (only ciliolate), caducous. *Figs* axillary, mostly solitary, subsessile or with a peduncle up to 0.3 cm long; basal bracts 3,1 mm long, glabrous, receptacle subglobose to ellipsoid to obovoid, 1–1.5 cm diam. when dry, densely papillate-tuberculate with blunt processes up to 1 mm long, ± sparsely appressed-puberulous, bright red at maturity, apex convex to slightly protracted, ostiole 2–2.5 mm diam., ± prominent; internal hairs sparse, minute. — **Fig. 26g–n.**

Distribution — Philippines (Palawan, Dumaran, also Luzon?).

Habitat & Ecology — Often along streams (sometimes rheophytic), cliffs, or secondary growth; at low altitudes.

Note — The lamina is sometimes linear with up to 25 pairs of lateral veins and the basal pair not distinct.

Section Eriosycea

Ficus L. subg. *Ficus* sect. *Eriosycea* Miq., London J. Bot. 7 (1848) 455; Fl. Ind. Bat. 1, 2 (1859) 293; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290.

Trees or shrubs; indumentum often brown(ish) and hairs often partly tufted. *Leaves* often palmately lobed to fid, especially when juvenile; cystoliths absent. *Figs* often below the leaves on previous season's growth, in pairs, often sessile. *Stamens* 1 or 2. *Tepals* red or yellowish and set(ul)ose. *Stigma* 1. *Fruits* tuberculate.

Distribution — This section ranges from New Guinea to NE India and China, is centred in western Malesia, and comprises 29 species, of which 25 species Malesian.

Subdivision — Section *Eriosycea* can be readily subdivided into two subsections on the basis of the colour and indumentum of the perianth of the pistillate flower: subsect. *Eriosycea* and subsect. *Auratae*, *F. diamantiphylla* being an exception.

Pollinators — *Blastophaga* subg. *Valisia* (Wiebes, The Indo-Australian Agaoninae (pollinators of figs), 1994).

Section Eriosycea subsection Eriosycea

Ficus L. subg. *Ficus* sect. *Eriosycea* Miq. subsect. *Eriosycea* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 419.

Ficus L. sect. *Trichosycea* Miq., Fl. Ind. Bat. 1, 2 (1859) 296; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290. — *Ficus* L. subg. *Ficus* sect. *Ficus* subsect. *Eriosycea* (Miq.) Corner subser. *Trichosyceae* Corner, Gard. Bull. Singapore 17 (1960) 419.

Ficus L. sect. *Eusyce* (Miq.) Benth. & Hook.f. subsect. *Arboreae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 336, 385, p.p.

Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Eriosycea* (Miq.) Corner ser. *Eriosyceae* Corner, Gard. Bull. Singapore 17 (1960) 419.

Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Eriosycea* (Miq.) Corner subser. *Eriosyceae* Corner, Gard. Bull. Singapore 17 (1960) 419.

Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Eriosycea* (Miq.) Corner subser. *Dehiscentes* Corner, Gard. Bull. Singapore 17 (1960) 419.

Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Eriosycea* (Miq.) Corner subser. *Cuneifoliae* Corner, Gard. Bull. Singapore 17 (1960) 420.

Trees or treelets. *Leaves* often palmately lobed to fid when juvenile, but often also on fertile branches. *Tepals* of pistillate flowers (3–)4–5(–7), red, glabrous or ciliolate. Hairs at the base of ovaries and stamens.

Distribution — This subsection comprises 19 species in an area extending from NE India to New Guinea, 15 species are Malesian.

Note — Some groups of related species can be distinguished:

a. *Ficus chartacea*-group (subser. *Cuneifoliae* Corner) — Lamina entire and relatively small, the 'gall-figs' not dehiscent. The group comprises *F. chartacea*, *F. litseifolia*, and *F. oreophila*.

b. *Ficus fulva*-group (subser. *Trichosyceae* Corner) — Lamina often palmately lobed to fid with the indumentum confined to the venation beneath. It comprises *F. fulva*, *F. halmaherae*, *F. hirta*, *F. mollissima*, *F. schefferiana*, and *F. subfulva*.

c. *Ficus glandulifera*-group (subser. *Dehiscentes* Corner) — Lamina usually entire and the 'gall-figs' dehiscent. It comprises *F. banahaensis*, *F. glandulifera*, *F. lamponga*, and *F. ruficaulis*. These species are closely related and rather difficult to tell apart. *Ficus glandulifera* has distinct waxy glands, in pairs laterally at the base of the petiole. *Ficus lamponga* and *F. ruficaulis* have (often inconspicuous) median waxy glands at the base of the petiole, in *F. ruficaulis* ± band-shaped. *Ficus banahaensis* lacks waxy glands at the base of the petiole.

d. *Ficus grossularioides*-group (subser. *Eriosyceae* Corner) — Lamina often palmately lobed to fid with the areoles felted tomentose beneath. It comprises *F. grossularioides*, *F. padana*, and *F. tricolor*.

11. **Ficus banahaensis** Elmer

Ficus banahaensis Elmer, Leafl. Philipp. Bot. 1 (1907) 252; 4 (1911) 1254; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 46; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 266, 369.

Ficus camiguinensis Merr., Philipp. J. Sci., Bot. 9 (1914) 276. — *Ficus banahaensis* Elmer var. *camiguinensis* (Merr.) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 267, 370. — *Ficus glandulifera* (Wall. ex Miq.) King var. *camiguinensis* (Merr.) Corner, Gard. Bull. Singapore 17 (1960) 433.

Tree up to 7 m tall. *Leafy twigs* 3–5(–7) mm thick, sparsely whitish appressed-puberulous (mostly only just below the scars of the stipules) to rather densely yellowish appressed-puberulous; periderm flaking off; branches brown to dark brown to purplish with rather prominent scars of the stipules. *Leaves* spirally arranged; lamina elliptic to oblong, 6–21 by 3–11 cm, chartaceous to subcoriaceous, apex acuminate, base obtuse to rounded (to truncate), margin repand (to entire); upper surface very sparsely appressed-puberulous, lower surface sparsely appressed-puberulous to substrigose on the main veins; cystoliths absent; lateral veins (4–)5–7 pairs, the basal pair slightly different from the other lateral veins, up to (1/3–)1/2–2/3 the length of the lamina, mostly branched, other veins lateral sometimes branched or furcate far from the margin, tertiary venation loosely scalariform; waxy glands in the axils of the basal lateral veins; petiole 1–7 cm long, sparsely puberulous, the epidermis persistent or flaking off; stipules 0.8–1.2 cm long, whitish to yellowish appressed-puberulous to subsericeous, caducous. *Figs* below the leaves on previous season's growth, in pairs; peduncle 0.4–0.7 cm long; basal bracts 3, c. 2 mm long, ciliolate; receptacle subglobose to obovoid, 0.7–1 cm diam. when dry, sometimes up to 0.2 cm long stipitate, sparsely appressed-puberulous, finely ribbed, 'seed-figs' orange at maturity, 'gall-figs' yellowish (?) at maturity and irregularly longitudinally dehiscent, apex convex, ostiole c. 3 mm diam., flat, the outer ostiolar bracts ciliolate or partly appressed-puberulous; internal hairs abundant, whitish.

Distribution — Philippines (Luzon, Samar, Leyte, Mindanao).

Habitat — Forest, at altitudes up to 1200 m.

Note — The species is very close to *F. glandulifera*, but it can be readily distinguished and merits the rank of species and not that of variety in *F. glandulifera* (Corner, Gard. Bull. Singapore 21 (1965) 47). It differs from *F. glandulifera*, e.g., in the absence of the waxy glandular spots at the base of the petiole, a somewhat different venation of the lamina, as in the basal lateral veins running up to 1/2–2/3 the length of the lamina, the sparse indumentum on the leafy twigs, the figs being (sub)glabrous, even around the ostiole, and the usually repand margin of the lamina.

12. **Ficus chartacea** (Wall. ex Kurz) Wall. ex King

Ficus chartacea (Wall. ex Kurz) Wall. ex King, Sp. Ficus 2 (1888) 159, t. 203; Fl. Brit. India 5 (1888) 533; Ridl., Fl. Malay Penins. 3 (1924) 350; Gagnep., Fl. Indo-Chine 5 (1928) 789; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1006; Merr., Pap. Michigan Acad. Sci. 24 (1939) 64; Corner, Wayside Trees (1940) 682; Gard. Bull. Singapore 21 (1965) 47; Philos. Trans., Ser. B, 259 (1970) 357, 373, t. 17; Kochummen, Tree Fl. Malaya 3 (1978) 142; Tree Fl. Sabah & Sarawak 3 (2000) 268.

Ficus lamponga Miq. var. *chartacea* Wall. ex Kurz, Forest Fl. Burma 2 (1877) 451.

Ficus chartacea (Wall. ex Kurz) Wall. ex King var. *torulosa* King, Sp. Ficus 2 (1888) 159.

Ficus chartacea (Wall. ex Kurz) Wall. ex King var. *lanceolata* Corner, Gard. Bull. Singapore 17 (1960) 433.

Shrub or tree up to 12 m tall; milk sap sometimes watery. *Leafy twigs* 1–2.5 mm thick, (sub)glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)obovate (or to lanceolate), 5–16(–21) by 1–8 cm, chartaceous (to sub-

coriaceous), 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, the basal pair not distinct from the other lateral veins, 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* mostly below the leaves on previous season's growth, in pairs, with a peduncle 0.1–0.4 cm long (or sessile); basal bracts 3, c. 1 mm long, only ciliolate; receptacle subglobose, 0.4–0.8 cm diam. when dry, 0.6–1.2 cm diam. when fresh, sometimes up 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.

Distribution — Myanmar, S China, Indochina, Thailand; in *Malesia*: Malay Peninsula, Borneo.

Habitat — Forest, forest margins, streamsides, and secondary growth, at altitudes up to 1750 m.

Uses — The bark is used for string.

Note — The species is rather uniform, with some variation in the shape of the lamina and the length of the peduncle.

13. **Ficus fulva** Reinw. ex Blume

Ficus fulva Reinw. ex Blume, Bijdr. (1825) 478; Hassk., Cat. Hort. Bog. (1844) 77; de Vriese, Descr. & Fig. Pl. Nouv. & Rar. 1 (1847) t. 1, 3; Miq., Pl. Jungh. (1851) 54; Fl. Ind. Bat. 1, 2 (1859) 296; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 269, 280; King, Sp. Ficus 2 (1888) 148, t. 187; Fl. Brit. India 5 (1888) 531; Kuntze, Rev. Gen. Pl. 1 (1891) 626, incl. var. *contracta* Kuntze; Koord., Minah. (1898) 600; Boerl., Bull. Inst. Bot. Buitenzorg 5 (1900) 28; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 252; Renner, Bot. Jahrb. Syst. 39 (1907) 403; Koord., Exk. Fl. Java 2 (1912) 117; Merr., Enum. Born. (1921) 223; Ridl., Fl. Malay Penins. 3 (1924) 347; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 571; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1009; Corner, Wayside Trees (1940) 682; M.F. Barrett, Am. Midl. Nat. 45 (1951) 134; Backer & Bakh.f., Fl. Java 2 (1965) 30; Corner, Gard. Bull. Singapore 21 (1965) 46; Philos. Trans., Ser. B, 259 (1970) 357, 373, t. 3, 16; Kochummen, Tree Fl. Malaya 3 (1978) 348; Tree Fl. Sabah & Sarawak 3 (2000) 276.

Ficus chrysocarpa Reinw. ex Blume, Bijdr. (1825) 475; Miq., Fl. Ind. Bat. 1, 2 (1859) 302; Fl. Ind. Bat., Suppl. (1861) 427; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 270, 291. — *Ficus fulva* Reinw. ex Blume var. *chrysocarpa* (Reinw. ex Blume) Koord., Exk. Fl. Java 2 (1912) 117.

Ficus reinwardtii Link & Otto, Ic. Pl. Rar. 1 (1828) 6, t. 31 (1830); Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 22; Miq., London J. Bot. 7 (1848) 457.

Ficus fulva Reinw. ex Blume var. *rubinervia* Hassk., Cat. Hort. Bog. (1844) 77.

Ficus apiculata Miq. in Zoll., Syst. Verz. 2 (1854) 92, 98; Fl. Ind. Bat. 1, 2 (1859) 296; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 269, 290.

Ficus suborbicularis Miq., Fl. Ind. Bat., Suppl. (1861) 425.

Pogonotrophe flavidula Miq., Fl. Ind. Bat., Suppl. (1861) 435. — *Ficus flavidula* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 270 (sub *F. chrysocarpa*). — *Ficus chrysocarpa* Reinw. ex Blume var. *flavidula* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291.

Ficus discolor Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 221, 290; Boerl., Handl. 3 (1900) 369; Merr., Enum. Born. (1921) 222.

Ficus fulva Reinw. ex Blume var. *orbicularis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 269.
Ficus fulva Reinw. ex Blume var. *minor* King, Sp. Ficus 2 (1888) 149, t. 187.
Ficus fulva Reinw. ex Blume forma *typica* King, Sp. Ficus 2 (1888) 149, t. 187.
Ficus patens Ridl., J. Straits Branch Roy. Asiat. Soc. 86 (1922) 306; Fl. Malay Penins. 3 (1934) 348; Corner, Gard. Bull. Singapore 10 (1939) 286.
Ficus fulva Reinw. ex Blume var. *typica* M.F. Barrett, Am. Midl. Nat. 45 (1951) 134.
Ficus fulva Reinw. ex Blume var. *timorensis* Corner, Gard. Bull. Singapore 17 (1960) 432.
Ficus hirta auct. non Vahl: Treub, Ann. Jard. Bot. Buitenzorg 18 (1902) 124, t. 16–25.

Tree up to 20 m tall. *Leafy twigs* 3–13 mm thick, yellowish to brownish hirtellous to puberulous or to hirsute, often pairs of small waxy glands at the bases of the petioles; periderm persistent; branches dark brown. *Leaves* spirally arranged; lamina elliptic to obovate to oblong to suborbicular (and often somewhat contracted in the lower part, subpandurate) or (when juvenile) subpalmately 3–7-lobed to -fid with the midsegment sometimes pinnately lobed, 6–35 by 2.5–20 cm (when juvenile up to 50 by 35 cm), chartaceous to subcoriaceous, apex shortly acuminate, base cordate to cuneate, margin dentate to subentire; 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 up to 1/3–2/3 the length of the lamina, branched, other lateral veins often branched or furcate far 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 to subhirtellous to appressed-puberulous, caducous. *Figs* axillary and below the leaves on previous season's growth, in pairs, sessile or with a peduncle up to 0.5 cm long; basal bracts 3, 2–3.5 mm long, shortly white sericeous; receptacle subglobose to ovoid to ellipsoid, (0.8–)1–1.6(–2) cm diam. when dry, 1.2–2(–2.5) cm diam. when fresh, yellowish appressed-puberulous to hirtellous to brownish subvelutinous, occasionally one or some lateral bracts, yellow to orange at maturity, apex convex or slightly protracted, ostiole 2.5–4 mm diam., the outer ostiolar bracts erect; internal hairs abundant (or few), yellowish. — **Fig. 27.**

Distribution — Nicobar Islands, Lower Thailand; *Malesia*: Malay Peninsula, Sumatra, Java, Lesser Sunda Islands (Bali, Sumbawa, Sumba, Flores, Timor), Borneo, Celebes.

Habitat — Forest and secondary growth, at altitudes up to 1500 m.

Uses — The bark is used for string; the latex contains wax.

Notes — 1. The species is quite variable. Two more or less intergrading forms can be distinguished:

a. With the indumentum on various parts yellowish to pale brown, the lamina elliptic to oblong to (sub)obovate, and the stipules mostly 1.2–2.5(–3.2) cm long, with appressed thin whitish or pale yellow hairs. — Malay Peninsula, Sumatra, Java, Borneo, Celebes, Lesser Sunda Islands, Moluccas.

b. With the indumentum usually darker to bright yellow or brownish, the lamina broader, to suborbicular and then often rounded to truncate towards the short acumen, and the stipules (even on relatively thick leafy twigs) shorter, 0.8–1.2 cm long, with yellow hairs, often not fully or only partly appressed. — Sumatra, Java, Celebes.

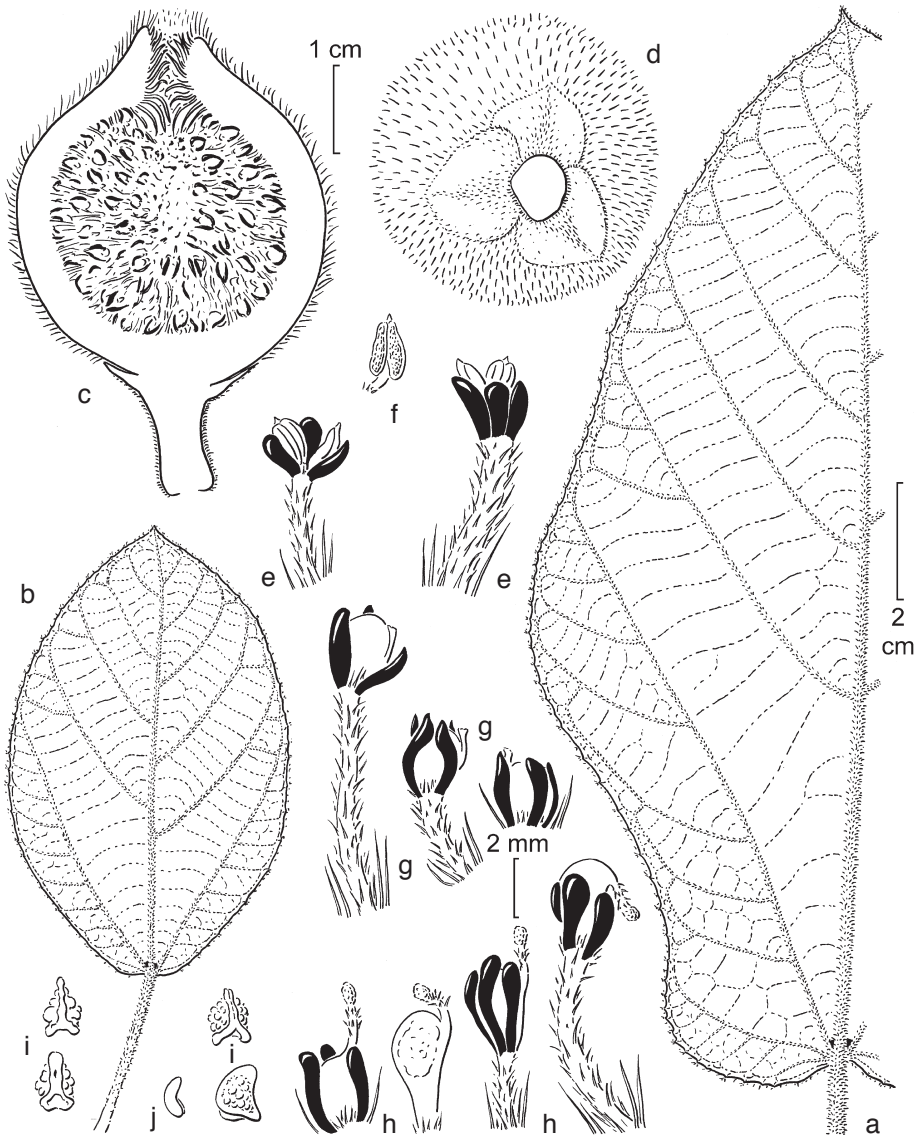


Fig. 27. *Ficus fulva* Reinw. ex Blume. a, b. Leaves; c. fig.; d. basal bract; e. staminate flowers; f. stamen; g. short-styled flowers; h. long-styled flowers and separate pistil; i. fruits; j. embryo (all: *Corner s.n.*). From Philos. Trans., Ser. B, 259 (1970) 372.

2. The latter form comprises some material (with relatively large ellipsoid brownish subvelutinous receptacles) which has been referred to *F. hirta* var. *roxburghii* by Corner, as well as to the type of *F. suborbicularis*.

3. The fruits are mostly tuberculate and distinctly keeled, but sometimes smooth and slightly keeled (as in the Lesser Sunda Islands).

14. Ficus glabristipulata C.C. Berg

Ficus glabristipulata C.C. Berg, Blumea 48 (2003) 534.

Tree. *Leafy twigs* 8–10 mm thick, sparsely puberulous; periderm flaking off in small flakes. *Leaves* spirally arranged; lamina oblong, 17–25 by 8–13 cm, coriaceous, apex shortly acuminate, base cordulate, margin entire, revolute; upper surface sparsely puberulous on the midrib, smooth, lower surface densely puberulous on the veins; cystoliths absent; lateral veins 6 or 7 pairs, the basal pair up to 1/3–1/2 the length of the lamina, branched, other lateral veins sometimes branched or furcate far from the margin, tertiary venation scalariform, venation incl. reticulum prominent; waxy glands in the axils of the basal lateral veins; petiole 3–12 cm long, sparsely puberulous, the epidermis flaking off; stipules c. 1.5 cm long, glabrous, caducous. *Figs* axillary, in pairs, subsessile; basal bracts 3, 2–3 mm long, sparsely appressed-puberulous; receptacle subglobose, 1.5–1.8 cm diam. when dry, puberulous, colour at maturity unknown, apex convex, ostiole c. 2.5 mm diam., slightly prominent; internal hairs abundant, short, whitish.

Distribution — Sumatra, only known from the type collection, without indication about the habitat.

Note — This species resembles *F. schefferiana*, from which it differs, e.g., by the exfoliating epidermis of the petiole and periderm of the leafy twig, the prominent reticulum of the lamina beneath, and the larger fig receptacle.

15. Ficus glandulifera (Wall. ex Miq.) King

Ficus glandulifera (Wall. ex Miq.) King, Sp. Ficus 2 (1888) 143, t. 180; Fl. Brit. India 5 (1888) 532; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 245; Koord., Atlas Baumart. Java 4 (1918) t. 772; Ridl., Fl. Malay Penins. 3 (1924) 347; Gagnep., Fl. Indo-Chine 5 (1928) 784; Corner, Wayside Trees (1940) 682; Backer & Bakh.f., Fl. Java 2 (1965) 29; Corner, Gard. Bull. Singapore 21 (1965) 47.

Pogonotrophe glandulifera Wall. ex Miq., London J. Bot. 7 (1848) 77; Fl. Ind. Bat. 1, 2 (1859) 331; Kochummen, Tree Fl. Malaya 3 (1978) 147; Tree Fl. Sabah & Sarawak 3 (2000) 278, t. 10.

Pogonotrophe aurantiaca Miq. in Zoll., Syst. Verz. 2 (1854) 93, 99; Fl. Ind. Bat. 1, 2 (1859) 332. — *Ficus aurantiaca* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293, non Kunth & C.D. Bouché 1847.

Pogonotrophe sumatrana Miq., Fl. Ind. Bat., Suppl. (1861) 436.

Ficus hasskarlii Merr., Philipp. J. Sci., Bot. 11 (1916) 264; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 372.

Ficus henschelii Merr., Philipp. J. Sci., Bot. 11 (1916) 264; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 372.

Ficus glandulifera (Wall. ex Miq.) King var. *villosa* Corner, Gard. Bull. Singapore 17 (1960) 433.

Tree up to 30 m tall, deciduous. *Leafy twigs* 2–4 mm thick, (dark) brown subtomentose or densely (to sparsely) brown(ish) patent- to appressed-puberulous, with pairs of waxy glands at the bases of the petioles; periderm persistent; branches usually dark purplish to blackish with prominent scars of the petioles. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)obovate or to (sub)ovate (or lanceolate), (4–)6–16(–20) by (2–)3.5–8(–9) cm, chartaceous to subcoriaceous, apex acuminate, base subcordate to cordulate to cuneate, margin entire, 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 slightly or not distinct from the other lateral veins, up to 1/3–1/2 the length of the lamina, unbranched or faintly branched, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins or absent; petiole 1–10 cm long, brown subtomentose to ± densely appressed-puberulous, the epidermis persistent (or flaking off); 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 up 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 c. 2 mm diam., ± prominent; internal hairs abundant, yellowish.

Distribution — Thailand; in *Malesia*: Malay Peninsula, Sumatra (incl. Riouw Archipelago and Banka), Java, Borneo, Philippines (Luzon, Palawan), Celebes, Moluccas (Morotai, Sula Islands, Ceram, Ambon, Aru Islands), New Guinea.

Habitat — Forest, at altitudes up to 1500 m.

Note — The species is rather variable with regard to the denseness of the indumentum on the lower leaf surface; material from Borneo, Celebes and New Guinea has laminas with densely subtomentose lower surfaces.

16. Ficus grossularioides Burm.f.

Ficus grossularioides Burm.f., Fl. Ind. (1768) 227; Miq., London J. Bot. 7 (1848) 234; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292 (excl. syn. Rheede); Backer, Blumea 6 (1948) 309; Backer & Bakh.f., Fl. Java 2 (1965) 30; Corner, Gard. Bull. Singapore 21 (1965) 44; Philos. Trans., Ser. B, 259 (1970) 354, t. 1; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 278.

Shrub or tree up to 8(–15) m tall. *Leafy twigs* 2–5 mm thick, appressed-puberulous; periderm usually persistent. *Leaves* spirally arranged; lamina elliptic to oblong to ovate or (when juvenile) (sub)palmately 3–5(–7)-lobed to -fid, 3–15 by 1.5–7.5 cm (when juvenile up to 35 by 30 cm), chartaceous to subcoriaceous (or coriaceous), apex shortly acuminate, base cuneate to rounded to subcordate (when juvenile cordate to cuneate), margin dent(icul)ate (at least towards the apex); upper surface hispidulous and ± 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 (when juvenile –8) pairs, the basal pair up to 1/3–1/2 the length of the lamina, mostly branched, other lateral veins often branched or furcate far from the margin, tertiary venation loosely scalariform; waxy glands in the axils of the basal 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 up to 0.2 cm long; basal bracts 3, 1–2.5 mm long, white appressed-puberulous;

receptacle (sub)globose to ellipsoid to ovoid or to depressed-globose, 0.5–1.2(–1.5) cm diam. when dry, 0.6–1.3 (or more) cm diam. when fresh, sparsely to densely appressed-puberulous, yellow to orange to brownish to red at maturity, apex convex, ostiole 2–2.5 mm diam., ± prominent; internal hairs few, whitish.

Uses — Young shoots are eaten raw; decoctions of leaves are used to treat kidney complaints.

Notes — 1. Leaves on the same twig can vary considerably in dimensions and shape of the lamina and in the length of the petiole. Leaves with adult and juvenile features often occur on the same twig.

2. Three varieties can be distinguished.

KEY TO THE VARIETIES

1a. Margin of the lamina entire . . . . . **c.** var. **stenoloba**
b. Margin of the lamina dentate 2
2a. Main veins of the lamina hirtellous beneath . . . . . **b.** var. **kingii**
b. Main veins of the lamina appressed-puberulous to glabrous beneath . . . . . **a.** var. **grossularioides**

a. var. **grossularioides**

Ficus alba Reinw. ex Blume, Bijdr. (1825) 467; Miq., Fl. Ind. Bat. 1, 2 (1859) 294; Fl. Ind. Bat., Suppl. (1861) 424; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 270, 290; King, Sp. Ficus 2 (1888) 147, t. 186; Fl. Brit. India 5 (1888) 530; Kuntze, Rev. Gen. Pl. 1 (1891) 626; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 256; Renner, Bot. Jahrb. Syst. 39 (1907) 403; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 364; Koord., Atlas Baumart. Java 4 (1918) t. 775; Merr., Enum. Born. (1921) 220; Ridl., Fl. Malay Penins. 3 (1924) 347; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 567; Ochse & Bakh., Veg. Dutch East Indies (1931) 493; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1003; Corner, Wayside Trees (1940) 681, t. 209.

Ficus nivea Blume, Bijdr. (1825) 476; Miq., Fl. Ind. Bat. 1, 2 (1859) 294.

Ficus palmata Roxb., Fl. Ind., ed. Carey 3 (1832) 529, non Forssk. 1775.

Ficus hunteri Miq., London J. Bot. 7 (1848) 225; Fl. Ind. Bat. 1, 2 (1859) 296; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290.

Ficus gossypina Wall. ex Miq., London J. Bot. 7 (1848) 455. — *Ficus alba* Reinw. ex Blume var. *gossypina* Kuntze, Rev. Gen. Pl. 1 (1891) 626.

Ficus gossypina Wall. ex Miq. forma *integrifolia* Miq., London J. Bot. 7 (1848) 455.

Ficus gossypina Wall. ex Miq. forma *lobata* Miq., London J. Bot. 7 (1848) 455. — *Ficus chloroleuca* Miq., Fl. Ind. Bat. 1, 2 (1859) 294.

Ficus mappan Miq., Fl. Ind. Bat., Suppl. (1861) 425. — *Ficus alba* Reinw. ex Blume var. *mappan* (Miq). Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290.

Ficus alba Reinw. ex Blume var. *nudinervis* Kuntze, Rev. Gen. Pl. 1 (1891) 626.

Ficus lobata Hunter ex Ridl., J. Straits Branch Roy. Asiat. Soc. 53 (1909) 123.

Lamina subcoriaceous to chartaceous, margin dentate, upper surface scabridulous (to scabrous), lower surface glabrous or sparsely appressed-hairy on the main veins. *Fig* receptacle 0.5–1.2 cm diam. when dry.

Distribution — Lower Thailand; in *Malesia*: Malay Peninsula, Sumatra (incl. Riouw Archipelago), Java, Borneo.

Habitat — Forest and secondary growth, at altitudes up to 800(–1350) m.

b. var. **kingii** Kuntze

Ficus grossularioides Burm.f. var. *kingii* Kuntze, Rev. Gen. Pl. 1 (1891) 626; King, Sp. Ficus 2 (1888) t. 186, f. 1.

Lamina chartaceous, margin dentate, upper surface often more scabrous than in var. *grossularioides*, lower surface hirtellous on the main veins. *Fig* receptacle 0.5–1 cm diam. when dry.

Distribution — Malay Peninsula (Perak), Sumatra (incl. Mentawi Islands), Borneo (Kalimantan).

Habitat — Forest, at altitudes up to 1200 m.

c. var. **stenoloba** Corner

Ficus grossularioides Burm.f. var. *stenoloba* Corner, Gard. Bull. Singapore 17 (1960) 430.

Lamina relatively small, up to 16 by 5 cm (or when juvenile up to 18 by 14 cm), coriaceous, margin entire, upper surface smooth, lower surface (sub)glabrous on the main veins. *Fig* receptacle relatively large, 0.8–1.5 cm diam. when dry.

Distribution —Sumatra (Sibolangit, Sibajak, Toba, Siboga).

Habitat — Forest, at altitudes between 1000 and 1750 m.

Note — This entity matches the ± typical material of the species in some features and *F. tricolor* in others (like the coriaceous, entire, and smooth lamina). Considering the morphological and ecological similarities with *F. tricolor* it could be regarded as an infraspecific entity as well.

17. Ficus halmaherae Corner

Ficus halmaherae Corner, Gard. Bull. Singapore 17 (1960) 431; 21 (1965) 46.

Tree up to c. 30 m tall. *Leafy twigs* 10–12 mm thick, minutely puberulous and brown setose (with irritating hairs), scabrous; periderm persistent. *Lamina* cordiform, c. 20–25 by 15–18, chartaceous, apex acuminate, base deeply cordate, margin denticulate; upper surface hirtellous, smooth, lower surface densely brownish subhirsute to hirtellous to subvelutinous on the veins; cystoliths absent; lateral veins 4 or 5 pairs, the basal pair up to 1/2 the length of the lamina, branched, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins; petiole 10–16 cm long, hirtellous, the epidermis persistent; stipules c. 2.5 cm long, hirtellous, persistent. *Figs* axillary (?); peduncle 2–4 cm long; basal bracts 3, 1.5–2 cm long, strigillose; receptacle ellipsoid, 1.3–1.8 cm diam. when dry, substipitate, puberulous and brown setulose (with irritating hairs), green (?) at maturity, apex convex to slightly umbonate, ostiole c. 3 mm diam., surrounded by short apical bracts; internal hairs abundant, yellowish.

Distribution — Moluccas (Halmahera: Gn. Sembilan).

Habitat — Forest, at 600 m.

Note — This species (only known by the type collection) is distinct by the irritating hairs on the leafy twigs and figs. It resembles *F. hirta* var. *roxburghii*.

18. **Ficus hirta** Vahl

Ficus hirta Vahl, Enum. Pl. 2 (1805) 201; Blume, Bijdr. (1825) 476; Miq., London J. Bot. 7 (1848) 456; Fl. Ind. Bat. 1, 2 (1859) 297, t. 18; Benth., Fl. Hongk. (1861) 329; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290; Kurz, Forest Fl. Burma 2 (1877) 449; Solms, Bot. Zeit. 43 (1885) 516, t. V, t. 22–27; King, Sp. Ficus 2 (1888) 149, t. 188; Fl. Brit. India 5 (1888) 531; Kuntze, Rev. Gen. Pl. 1 (1891) 627; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 462; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 250; Koord., Atlas Baumart. Java 4 (1918) t. 774; Gagnep., Fl. Indo-Chine 5 (1928) 804; Hand.-Mazz., Symb. Sin. 7 (1929) 99; Ochse & Bakh., Veg. Dutch East Indies (1931) 500; Chun, Sunyatsenia 1 (1934) 225; M.F. Barrett, Am. Midl. Nat. 45 (1951) 137, incl. var. *typica* M.F. Barrett; Backer & Bakh.f., Fl. Java 2 (1965) 29; Corner, Gard. Bull. Singapore 21 (1965) 45.
Ficus tridactylites Gagnep., Not. Syst. 4 (1927) 98; Fl. Indo-Chine 5 (1928) 817.
Ficus hirta Vahl var. *imberbis* Gagnep., Fl. Indo-Chine 5 (1928) 804.

Shrub or tree up to 15 m tall. *Leafy twigs* 2–10(–15) mm thick, whitish to dark brown puberulous to hirtellous and pale brown to yellowish hirtellous to subhirsute or to dark brown hirsute, sometimes hollow; periderm persistent. *Leaves* spirally arranged (to subdistichous); lamina elliptic to oblong to (sub)obovate or to ovate to cordiform to suborbicular, often with a constriction in the lower part of the lamina, when juvenile (sub)palmately 3–7-lobed to -fid or pinnately lobed or the midsegment sometimes pinnately lobed, (6–)10–32 by (2–)5–25(–30) cm (when juvenile up to 45 by 45 cm), chartaceous to subcoriaceous, apex (shortly) acuminate, base cordate to rounded, margin dent(icul)ate; upper surface strigillose to hirtellous to hirsute, ± scabrous to smooth, lower surface densely to rather sparsely whitish puberulous and pale to dark brown hirtellous to substrigose to hirsute on the veins, often scabridulous; cystoliths absent; lateral veins 4–8 pairs, the basal pair up to 1/4–2/3 the length of the lamina, often branched, other lateral veins often branched or furcate far from the margin, tertiary venation scalariform, ± prominent beneath; waxy glands in the axils of the basal lateral veins; petiole 1.5–6(–15) cm long, whitish puberulous to pale to dark brown hirtellous to hirsute or partly brown and partly white (sub)sericeous, the epidermis persistent; stipules 0.8–2(–4) cm long, ciliolate and with stiff appressed to ± 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 subpersistent). *Figs* axillary and below the leaves on previous season's growth, in pairs, sessile or with a peduncle up to 0.3 cm long; basal bracts 3, 2–5(–9) mm long and persistent or 0.8–2.5 cm long and caducous; receptacle subglobose to ovoid to ellipsoid (to cylindrical), 0.7–1.5(–2) or (1.5–)2–2.5(–3.5) cm diam. when dry, 1–3(–4) cm diam. when fresh, pale to dark brown hirtellous to hispidulous or to hirsute, sometimes with lateral bracts, red at maturity, apex ± convex, ostiole 2–3(–3.5) mm diam., ± prominent; internal hairs abundant to sparse, whitish.

Note — The species is very variable. Four (major) infraspecific entities can be recognized for the Malesian region; they are treated as subspecies.

KEY TO THE SUBSPECIES

1a. Lamina usually contracted in the lower part, often lobate, palmately, pinnately or both; stipules mostly only hairy on the keel; leafy twigs, petioles, and figs (rather) densely hairy. — S Sumatra, Java . . . . . **a.** subsp. **hirta**

b. Lamina not contracted in the lower part, palmately lobate or not; stipules hairy on the whole surface or, if only hairs on the keel, then the leafy twigs and petioles sparsely hairy 2

2a. Leafy twigs, petioles, and figs sparsely hairy; figs depressed-globose; lamina 3–5-lobed to -fid. — S Sumatra . . . . . **b.** subsp. **dumosa**

b. Leafy twigs, petioles, and figs densely hairy; fig receptacle globose, ovoid, ellipsoid or subcylindrical; lamina entire or 3–7-lobed to -fid. — N Sumatra and/or Malay Peninsula 3

3a. Stipules 0.8–1.2 cm long, with one type of hairs; fig receptacle globose, 0.8–1.2 cm diam. when dry. — N Sumatra . . . . . **c.** subsp. **ochracea**

b. Stipules (1–)1.5–2.5(–4) cm long, with brown stiff hairs on and along the keel and fine white hairs towards the margins; fig receptacle ovoid, ellipsoid or subcylindrical, (0.7–)1.5–2.5(–3.5) cm diam. when dry. — N Sumatra, Malay Peninsula . . . . . **d.** subsp. **roxburghii**

a. subsp. **hirta**

Ficus heterophylla Lam., Encycl. 2, 2 (1788) 499, non L.f. 1782.
Ficus setosa Blume, Bijdr. (1825) 477; Miq., London J. Bot. 7 (1848) 456. — *Ficus hirta* Vahl var. *setosa* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) t. 18.
Ficus setosa Hook. & Arn., Bot. Beech. Voy. (1836) 216, t. 49, non Blume 1825.
Ficus setifera Steud., Nomencl. Bot. ed. 2, 1 (1840) 638.
Ficus hibiscifolia Champ. ex Benth. in Hooker's J. Bot. Kew Gard. Misc. 6 (1854) 77. — *Ficus hirta* Vahl var. *hibiscifolia* (Champ. ex Benth.) Chun, Sunyatsenia 1 (1934) 225.
Ficus hirta Vahl var. *integrifolia* Miq., Fl. Ind. Bat. 1, 2 (1859) t. 18.
Ficus hirta Vahl var. *normalis* Kuntze, Rev. Gen. Pl. 1 (1891) 627.
Ficus porteri H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8 (1910) 550; Rehder, J. Arnold Arbor. 10 (1929) 126; 17 (1936) 77.
?*Ficus katsumadai* Hayata, Ic. Pl. Formos. 8 (1919) 127, t. 56.
Ficus palmatiloba Merr., Philipp. J. Sci. 21 (1922) 340; Gagnep., Fl. Indo-Chine 5 (1928) 791. — *Ficus hirta* Vahl var. *palmatiloba* (Merr.) Chun, Sunyatsenia 1 (1934) 225.
Ficus hirta Vahl var. *appressa* Corner, Gard. Bull. Singapore 17 (1960) 430.
Ficus hirta Vahl var. *brevipila* Corner, Gard. Bull. Singapore 17 (1960) 430.

Shrub or treelet up to 5 m tall. *Indumentum* whitish to brownish. *Leafy twigs* 2–4 mm thick. *Lamina* mostly oblong to elliptic to (subobovate) and usually constricted below in the lower part (subpandurate) or 3–5-lobed to -fid, distinctly palmate (with the basal vein(s) running into the lobes), often pinnate (the second or third pair of lateral veins running into the lobes), or subpalmate (basal and other lateral veins running into the lobes), 6–25 by 3.5–16 cm, chartaceous, basal lateral veins up to 1/2–3/4 the length of the lamina; petiole 1–6 cm long; stipules 0.5–2 cm long, mostly only ciliolate and with stiff brown hairs on and along the keel, sometimes also white appressed-puberulous towards the margins. *Figs* (sub)sessile; basal bracts 2–3 mm long, only the keel or the whole surface appressed-puberulous, persistent; receptacle (sub)globose, 0.4–1.2 cm diam. when dry, whitish to yellowish hirtellous.

Distribution — NE India, Nepal, Sikkim, Myanmar, S China (incl. Hainan), Indochina, Thailand; in *Malesia*: Java, Sumatra (Lampung).

Habitat — Mostly secondary growth, at altitudes up to 1100 m.

Note — The disjunctive distribution of this variety is remarkable.

b. subsp. **dumosa** (King) C.C. Berg

Ficus hirta Vahl subsp. *dumosa* (King) C.C. Berg, Blumea 48 (2003) 536. — *Ficus dumosa* King, Sp. Ficus 2 (1888) 151, t. 190. — *Ficus hirta* Vahl var. *dumosa* (King) Corner, Gard. Bull. Singapore 17 (1960) 430.

Shrub or treelet. *Indumentum* whitish, on the leafy twigs sparse and on the petiole appressed. *Leafy twigs* 2–5 mm thick. *Lamina* palmately 3–5(–7)-lobed to -fid, 10–15 by 6–11 cm, chartaceous, basal lateral veins up to 1/3–2/3 the length of the lamina; petiole 1–5 cm long; stipules 1–1.5 cm long, ciliolate and sparsely hairy on the keel. *Figs* sessile; basal bracts 3 (or more), 2–4 mm long, ciliolate, persistent; receptacle depressed-globose, 1–1.5 cm diam. when dry, subglabrous.

Distribution — Sumatra (southern: Bencoolen, Lampung).

Habitat — Montane (mossy) forest, at altitudes between 1000 and 2000 m.

c. subsp. **ochracea** C.C. Berg

Ficus hirta Vahl subsp. *ochracea* C.C. Berg, Blumea 48 (2003) 537.

Treelet up to 5 m tall. *Indumentum* yellowish to pale brown or partly dark brown, rather short. *Leafy twigs* 2–4 mm thick. *Lamina* oblong to elliptic to (sub)obovate, (6–)12–25 by (2.5–)6–11.5 cm, chartaceous, basal lateral veins up to 1/4–1/3 the length of the lamina; petiole 1.5–5 cm long; stipules 0.8–1.2 cm long, brown to yellowish subsericeous (the hairs not fully appressed). *Figs* sessile or with a peduncle up to 0.3 cm long; basal bracts 3–4 mm long, yellow appressed-puberulous to strigillose, persistent; receptacle globose, 0.8–1.2 cm diam. when dry, yellow subvelutinous.

Distribution — Sumatra (northern).

Habitat — Montane (mossy) forest, at altitudes between c. 1000 and 1800 m.

d. subsp. **roxburghii** (King) C.C. Berg

Ficus hirta Vahl subsp. *roxburghii* (King) C.C. Berg, Blumea 48 (2003) 537; 49 (2004) 154. — *Ficus roxburghii* Miq., London J. Bot. 7 (1848) 456, non Steud. 1840. — *Ficus hirta* Vahl var. *roxburghii* (Miq.) King, Sp. Ficus 2 (1888) 150, t. 189; Renner, Bot. Jahrb. Syst. 39 (1907) 403; Gagnep., Fl. Indo-Chine 5 (1928) 804; M.F. Barrett, Am. Midl. Nat. 45 (1951) 141.

Ficus hirsuta Roxb., Fl. Ind., ed. Carey 3 (1832) 528, non Schott 1827; Wight, Ic. 2 (1843) t. 670.

Ficus hirta Roxb., Fl. Ind., ed. Carey 3 (1832) 531, non Vahl 1805; Wight, Ic. 2 (1843) t. 672.

Ficus triloba Buch.-Ham. ex Voigt, Hort. Suburb. Calc. (1845) 284; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 270, 290; Kurz, Forest Fl. Burma 2 (1877) 449. — *Ficus hirta* Vahl var. *triloba* (Buch.-Ham.) Kuntze, Rev. Gen. Pl. 1 (1891) 627.

Ficus cordata Ridl., J. Straits Branch Roy. Asiat. Soc. 57 (1911) 93, non Kunth. & C.D. Bouché 1847, nec Thunb. 1786; Ridl., Fl. Malay Penins. 3 (1924) 347; Corner, Gard. Bull. Singapore 10 (1939) 285; Corner, Wayside Trees (1940) 282, t. 251 (as *F. hirta* Vahl).

Ficus quangtriensis Gagnep., Notul. Syst. (Paris) 4 (1927) 94; Gagnep., Fl. Indo-Chine 5 (1928) 805, t. 92.

Ficus hirta Vahl var. *roxburghiana* A.M. Cowan & J.M. Cowan, Trees N. Bengal (1929) 125.

Ficus hirta Vahl var. *malayana* Corner, Gard. Bull. Singapore 17 (1960) 430.

Ficus hirta Vahl var. *squamosa* Corner, Gard. Bull. Singapore 17 (1960) 431.

Shrub or tree up to 15 m tall. *Indumentum* on various parts pale to dark brown, hirsute to hirtellous. *Leafy twigs* often hollow. *Lamina* elliptic to oblong, not constricted in the

lower part, or cordiform and then mostly palmately 3–7-lobed to -fid, (5–)10–40 by (3.5–)5.5–40 cm; basal lateral veins up to 1/2–2/3 the length of the lamina; petiole (1.5–)5–15 cm long; stipules (1–)1.5–2.5(–4) cm long, white appressed-puberulous to sericeous and on and along the keel longer brown stiff hairs. *Figs* sessile; basal bracts 5–25 mm long, persistent or (if long) caducous, white appressed-puberulous to sericeous and with stiff brown hairs on and along the keel; receptacle ovoid to ellipsoid to subcylindrical, (0.7–)1.5–2.5(–3.5) cm diam. when dry, brown hirtellous to hirsute, sometimes with lateral bracts, ostiole surrounded by erect outer ostiolar bracts or stiff brown hairs.

Distribution — NE India, Sikkim, Vietnam, Thailand; in *Malesia*: Malay Peninsula, Sumatra (northern and eastern).

Habitat — Forest, at altitudes up to 1800 m, often between 1000 and 1800 m.

Notes — 1. This variety is more variable than the other three. It varies considerably in the shape and 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.

2. This subspecies resembles *F. halmaherae*.

19. Ficus lamponga Miq.

Ficus lamponga Miq., Fl. Ind. Bat., Suppl. (1861) 431; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; Kurz, Forest Fl. Burma 2 (1877) 451; Corner, Gard. Bull. Singapore 21 (1965) 47; Corner, Philos. Trans., Ser. B, 259 (1970) 370, t. 15; Kochummen, Tree Fl. Malaya 3 (1978) 150; Tree Fl. Sabah & Sarawak 3 (2000) 282.

Ficus lepidosa Wall. ex Kurz, J. Asiat. Soc. Bengal 42, 2 (1873) 107; Kurz, Forest Fl. Burma 2 (1877) 450; King, Sp. Ficus 2 (1888) 163; Fl. Brit. India 5 (1888) 522; Renner, Bot. Jahrb. Syst. 39 (1907) 404; Ridl., Fl. Malay Penins. 3 (1924) 350; Gagnep., Fl. Indo-Chine 5 (1928) 788.

Ficus lepidosa Wall. ex Kurz var. *martabanica* King, Sp. Ficus 2 (1888) 163.

Ficus balansae Gagnep., Notul. Syst. (Paris) 4 (1927) 86; Fl. Indo-Chine 5 (1929) 822.

Tree up to 33 m tall, becoming slightly buttressed, deciduous; milk 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 to elliptic to (subobovate), 8–25 by 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 (8–)10–13(–18) pairs, the basal pair not or slightly distinct from the other lateral veins, unbranched, tertiary venation scalariform; waxy glands absent; petiole 2–7.5 cm long, appressed-puberulous to strigillose or glabrous, the epidermis persistent or flaking off; stipules 0.5–1.2 cm long, brown 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 up to 0.2 cm long stipitate, sparsely to densely puberulous, 'seed-figs' orange-ochre to red at maturity,

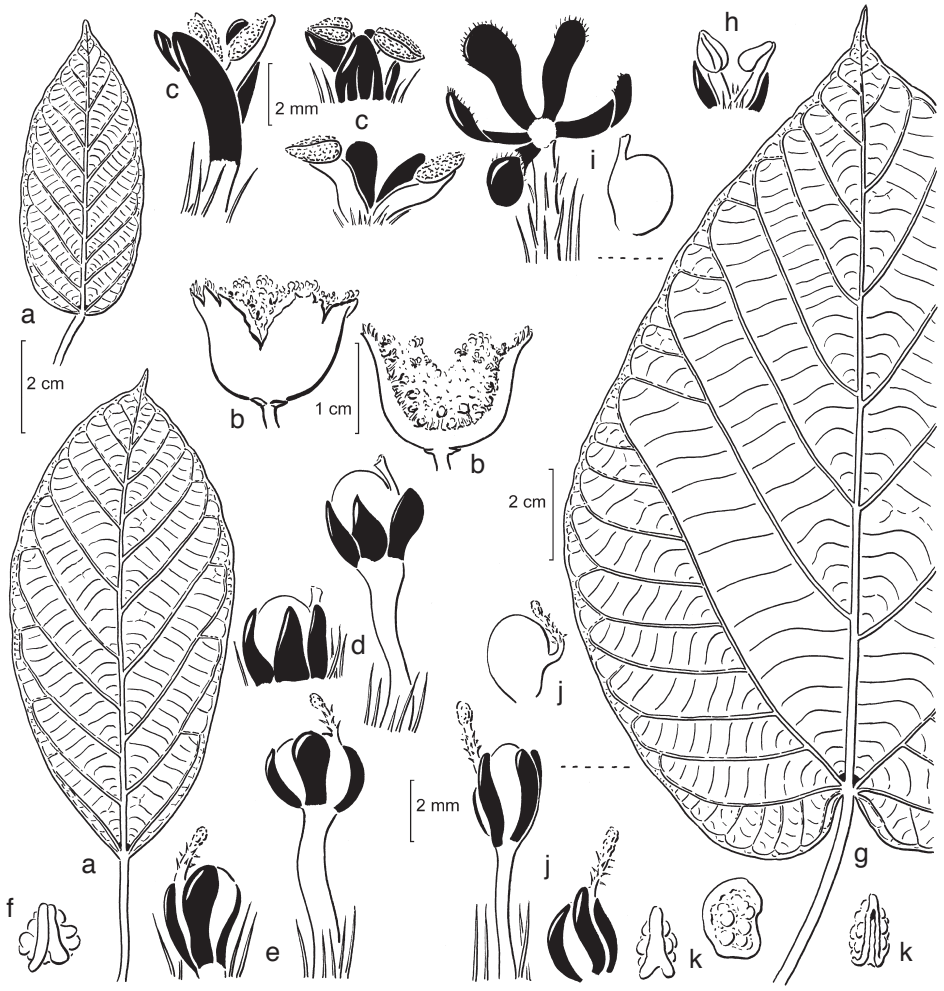


Fig. 28. a–f: *Ficus lamponga* Miq. a. Leaves; b. 'gall-figs'; c. staminate flowers; d. short-styled flowers; e. long-styled flowers; f. fruit. — g–k: *Ficus ruficaulis* Merr. g. Leaf; h. staminate flower; i. short-styled flower with separate pistil; j. long-styled flowers and separate pistil; k. fruits (a–d: *SF 29227*; e, f: *SF 34922*; g–i: *PNH 6129* and/or *18450*; j, k: *Elmer 22271*). From Philos. Trans., Ser. B, 259 (1970) 371.

'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. — **Fig. 28a–f.**

Distribution — NE India, Myanmar, Indochina, Thailand, Andaman Islands; in *Malesia*: Malay Peninsula, Sumatra, Borneo, Celebes.

Habitat — Forest, at low altitudes.

Notes — 1. The species is quite uniform. The material from Borneo is sparsely hairy, the stipules often only ciliolate.

2. The species is closely related to *F. glandulifera*, from which it can be distinguished by the absence of pairs of waxy glands and more numerous lateral veins. A single ± band-shaped gland is often found, in material outside Malesia, at the base of the petiole.

20. Ficus litseifolia Corner

Ficus litseifolia Corner, Gard. Bull. Singapore 17 (1960) 433; 21 (1965) 48; Philos. Trans., Ser. B, 259 (1970) 374, t. 18; Kochummen, Tree Fl. Malaya 3 (1978) 150.

Shrub or tree up to 8 m. *Leafy twigs* 1.5–3 mm thick, brown appressed-puberulous to strigillose; periderm persistent. *Leaves* spirally arranged; lamina oblong to subovate, 4–14 by 1.5–5 cm, chartaceous to coriaceous, apex acuminate to acute, base obtuse to subcuneate, margin entire (or sublobate); upper surface sparsely strigillose, more

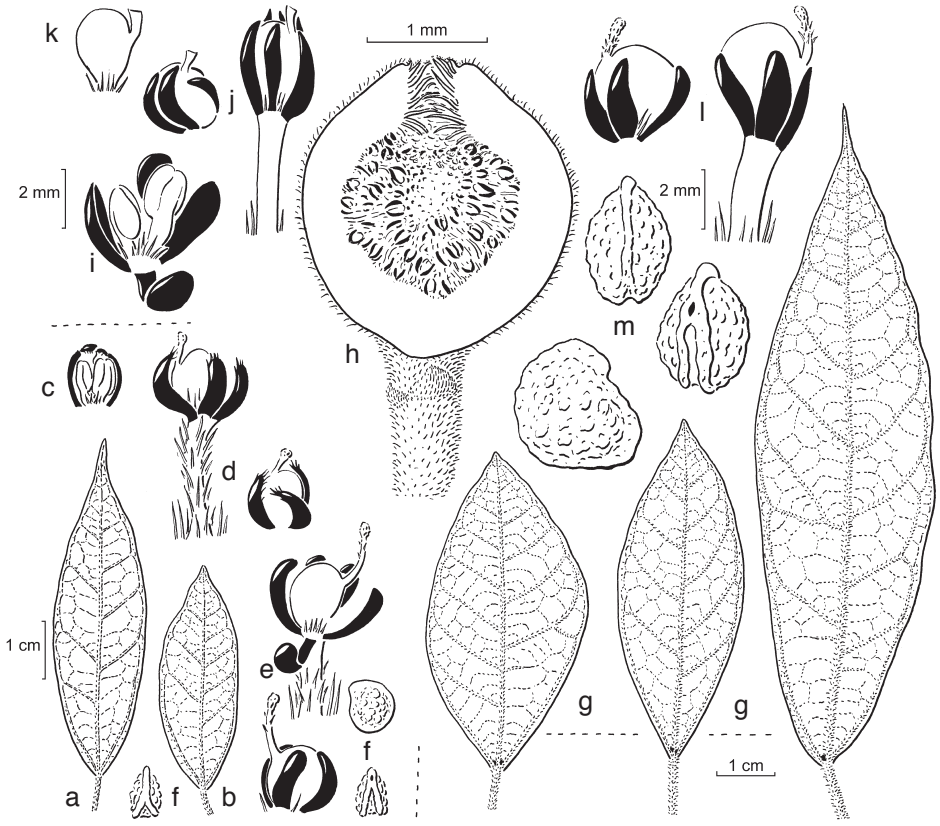


Fig. 29. a–f: *Ficus litseifolia* Corner. a, b. Leaves; c. staminate flower; d: short-styled flowers; e. long-styled flowers; f. fruits. — g–m: *Ficus oreophila* Ridl. g. Leaves; h. fig; i. staminate flower; j. short-styled flowers; k. 'gall-fruit'; l. long-styled flowers; m. fruits (a: *Forbes 2241*; b: *Corner s.n.*; c, d: *Van Steenis 3548*; e, f: *Alston 14740*; g–k: *Corner s.n.*; l, m: *SF 28864*). From Philos. Trans., Ser. B, 259 (1970) 375.

densely and sometimes with ± patent hairs on the midrib, smooth or ± scabrous, lower surface brown(ish) strigillose of the main veins or also minutely puberulous on the smaller veins; cystoliths absent; lateral veins 4–8 pairs, the basal pair running close to the margin, up to 1/4–1/3 the length of the lamina, unbranched, tertiary venation scalariform to reticulate; waxy glands in the axils of the basal lateral veins or absent; petiole 0.4–1.2 cm long, brown strigillose, the epidermis persistent; stipules 0.4–0.7 cm long, pale brown subsericeous, caducous. *Figs* axillary, in pairs; peduncle 0.2–0.7 cm long; basal bracts 3, 1–1.5 mm long, appressed-puberulous; receptacle subglobose, 0.5–0.8 cm diam. when dry, sometimes up to 0.1 cm long stipitate, sparsely to densely appressed-puberulous, orange to red at maturity, apex convex, ostiole 1.5–2 mm diam., slightly prominent; internal hairs abundant. — **Fig. 29a–f.**

Distribution — Sumatra (Atjeh, Mt Sago, Mt Dempo, Mt Raja).

Habitat — Montane forest, at altitudes between 1000–1600 m.

Notes — 1. This species is uniform and morphologically very close to *F. oreophila*; the differences are such that the two taxa could be regarded as subspecies.

2. Malayan material referred to this species by Corner proved to belong to *F. oreophila*.

21. Ficus mollissima Ridl.

Ficus mollissima Ridl., Fl. Malay Penins. 3 (1924) 348; Corner, Gard. Bull. Singapore 21 (1965) 46.

Tree up to 20 m tall, sometimes with short buttresses. *Leafy twigs* 5–10(–15) mm thick, pale brown to yellowish velutinous; periderm flaking off below the leaves. *Leaves* spirally arranged; lamina cordiform to ovate, 16–22 by 13–16 cm, chartaceous, apex acuminate, base cordate, margin dent(icul)ate; upper surface densely puberulous to hirtellous, smooth, lower surface pale brown to yellowish velutinous; cystoliths absent; lateral veins 5 or 6 pairs, basal pair up to c. 1/2 the length of the lamina, branched, other lateral veins often branched or furcate far from the 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; petiole 6–9 cm long, velutinous, the epidermis persistent; stipules c. 1 cm long, subvelutinous, caducous. *Figs* mostly below the leaves on previous season's growth, in pairs, (sub)sessile; basal bracts 3, c. 4 mm long, yellowish subvelutinous; receptacle subglobose to ovoid, 2–2.5 cm diam. when dry, yellowish velutinous, orange-brown at maturity, apex convex, ostiole c. 7 mm diam., the outer ostiolar bracts erect; internal hairs abundant.

Distribution — Malay Peninsula (Negri Sembilan).

Habitat — Forest, at low altitudes.

22. Ficus oreophila Ridl.

Ficus oreophila Ridl., J. Straits Branch Roy. Asiat. Soc. 82 (1920) 196; Fl. Malay Penins. 3 (1924) 348; Corner, Gard. Bull. Singapore 21 (1965) 48; Kochummen, Tree Fl. Malaya 3 (1978) 152.

Shrub or treelet up to 4 m tall; milk sap sometimes pink. *Leafy twigs* 2–3 mm thick, brown(ish) puberulous to hirtellous to hispidulous; periderm persistent. *Leaves* spirally arranged; lamina oblong to subobovate or to 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 to subhispidulous to strigillose, scabrous to smooth, lower surface densely to sparsely brown(ish) hirtellous to subtomentose puberulous on the veins; cystoliths absent; lateral veins 5–8 pairs, the basal pair running close to the margin, up 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 subsericeous, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.3–0.6 cm long; basal bracts 3, 1–2 mm long, minutely puberulous; receptacle subglobose to pyriform, 0.8–1.2 cm diam. when dry, 1.2–1.4 cm diam. when fresh, ± densely hirtellous to patent-puberulous, up to 0.5 cm long stipitate, orange to red at maturity, apex convex, ostiole 2–2.5 mm diam., flat or slightly prominent; internal hairs abundant. — **Fig. 29g–m.**

Distribution — Thailand; in *Malesia*: Malay Peninsula (Kelantan, Pahang, Perak).

Habitat — Montane forest, at altitudes between 1000 and 2000 m.

23. Ficus padana Burm.f.

Ficus padana Burm.f., Fl. Ind. (1768) 226; Backer & Bakh.f., Fl. Java 2 (1965) 30; Corner, Gard. Bull. Singapore 21 (1965) 44.

Ficus toxicaria L., Mant. Alt. (1771) 305; Lam., Encycl. 2, 2 (1788) 498; Vahl, Enum. Pl. 2 (1805) 202; Blume, Bijdr. (1825) 477; Miq., London J. Bot. 7 (1848) 226; Pl. Jungh. (1851) 52; Fl. Ind. Bat. 1, 2 (1859) 293, t. 20B; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 269, 290; King, Sp. Ficus 2 (1888) 146, t. 184; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 247; Renner, Bot. Jahrb. Syst. 39 (1907) 403; Koord., Atlas Baumart. Java 4 (1918) t. 773; Ridl., Fl. Malay Penins. 5 (1925) 334; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 576; Corner, Gard. Bull. Singapore 21 (1965) 44; Philos. Trans., Ser. B, 259 (1970) 357, t. 2. — *Ficus toxica* Thunb., Diss. 1, 21 (1786) n 27, 378, 387.

Ficus elegans Hassk., Cat. Hort. Bog. (1844) 76; Pl. Jav. Rar. (1848) 200; Miq., Fl. Ind. Bat. 1, 2 (1859) 294.

Tree up to 15 m tall, with a broad (umbrella-shaped) crown. *Leafy twigs* 5–15 mm thick, pale brown to whitish villous to subtomentose to subhirsute, with conspicuous to inconspicuous pairs of waxy glands at the bases of the petioles; periderm flaking off. *Leaves* spirally arranged; lamina cordiform to ovate to elliptic (or to oblong), (or when juvenile) (sub)palmately 3–5-lobed to -fid and the midsegment entire or pinnately lobed, 12–35 by 6–25 cm (when juvenile up to 50 by 35 cm), chartaceous to subcoriaceous, apex shortly acuminate (to subacute), base cordate, margin denticulate (to subentire); upper surface (sub)glabrous, lower surface densely pale brown to whitish villous, the indumentum often disappearing from the main veins; cystoliths absent; lateral veins 5–8 (when juvenile –13), when fresh often red, the basal pair up to 1/3–1/2 the length of the lamina, branched, other lateral veins often branched or furcate far from the margin, tertiary venation loosely scalariform; waxy glands in the axils of the (main) basal lateral veins, smaller ones in axils of other lateral veins; petiole 4–16 (when juvenile –30) cm long, pale brown to whitish villous to tomentose, the epidermis flaking off; stipules 2–5 cm long, pale brown to yellowish (sub)sericeous, caducous. *Figs* axillary, in pairs, (sub)sessile; basal bracts 3, 4–7 mm long, villous to subsericeous; receptacle subglobose, 2–3.5 cm diam. when dry, 3.5–5.5 cm diam. when fresh, 0.5–1.5 cm long

stipitate (or sometimes not), pale to dark brown villous, red at maturity, apex convex, ostiole 4–5 mm diam.; wall with flower-bearing processes into the fig cavity; internal hairs very few to abundant, white.

Distribution — Sumatra and Java.

Habitat — Forest and commonly in secondary growth, at altitudes up to 1500 m.

24. Ficus ruficaulis Merr.

Ficus ruficaulis Merr., Publ. Gov. Lab. Philipp. 17 (1904) 13; Philipp. J. Sci., 1, Suppl. (1906) 44; Elmer, Leafl. Philipp. Bot. 1 (1906) 60, 202; 1 (1907) 258; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 64; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 357, 368; Corner, Gard. Bull. Singapore 21 (1965) 47; Kochummen. Tree Fl. Sabah & Sarawak 3 (2000) 300.

Ficus gerontocarpa Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 201; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 357; Corner, Gard. Bull. Singapore 21 (1965) 47, 98. — Type: *Warburg 12950* (B), Philippines, Luzon, Sampaloc, March 1888, according to Sata consisting of leaves of *F. ruficaulis* and figs of *F. nota* (Blanco) Merr.; the former element was already chosen by Corner (1967: 47) as the name was included in the synonymy of *F. ruficaulis*; it is here formally designated.

Ficus ruficaulis Merr. var. *paloensis* Elmer, Leafl. Philipp. Bot. 1 (1906) 203. — *Ficus paloensis* (Elmer) Elmer, Leafl. Philipp. Bot. 2 (1908) 547; 4 (1911) 1322; 9 (1937) 3485. — *Ficus ruficaulis* Merr. forma *paloensis* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 358, 369.

Ficus antaoensis Hayata, Ic. Pl. Formos. 8 (1919) 122, f. 49; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 26. — *Ficus ruficaulis* Merr. var. *antaoensis* (Hayata) Hatus. & J.C. Liao, Quart. J. Chinese Forest. 22 (1989) 135; J.C. Liao, Taxon. Rev. Moraceae Taiwan, ed. 2 (1995) 74, t. 30.

Ficus hiiranensis Hayata, Ic. Pl. Formos. 8 (1919) 123, t. 50; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 26, 59.

Ficus zambalensis Elmer, Leafl. Philipp. Bot. 9 (1937) 3207; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 358, 370.

Tree up to 10 m tall. *Leafy twigs* 5–10 mm thick, smooth internodes (sub)glabrous or yellowish puberulous, at least along the margins of the conspicuous scars of the stipules; periderm persistent. *Leaves* spirally arranged; lamina elliptic to ovate to (sub)cordiform, sometimes 3-lobed, 12–28 by 7–18 cm, chartaceous to subcoriaceous, apex shortly acuminate, base cordate to rounded, margin entire; upper surface sparsely brown appressed-puberulous to densely whitish to brownish tomentose on the veins, smooth, lower surface densely brown to whitish hirtellous to subtomentose to rather sparsely puberulous on the veins; cystoliths absent; lateral veins 6–8(–9) pairs, the basal pair up to 1/3–1/2 the length of the lamina, branched, tertiary venation scalariform; waxy glands (inconspicuous) in the axils of the basal lateral veins; petiole 3–17 cm long, hirtellous to subtomentose, smooth, the epidermis persistent or sometimes slightly flaking off; stipules 1.2–2 cm long, brownish subtomentose to yellowish subsericeous on the whole surface or only along the midrib, caducous. *Figs* mostly below the leaves on previous season's growth, in pairs, with a peduncle 0.2–0.8 cm long (or sessile); basal bracts 3, c. 3 mm long, brown subsericeous; receptacle subglobose to ellipsoid to ovoid, 1.5–1.8 cm diam. when dry, sparsely to densely pale brown tomentose, 'seed-figs' yellow (to red?) at maturity, 'gall-figs' greenish at maturity and irregularly longitudinally dehiscent, apex convex or slightly protracted, ostiole 2.5–4 mm diam., ± prominent; internal hairs abundant, yellowish. — **Fig. 28g–k.**

Distribution — Taiwan; in *Malesia*: Philippines (Luzon, Mindanao), Celebes.

Habitat — Forest, at altitudes up to 1200 m.

Notes — 1. The species is rather uniform. It shows some variation in the indumentum, the denseness, and the type of hairs.

2. Two collections from New Guinea referred to this species with some doubt, proved to belong to *F. robusta*.

25. Ficus schefferiana King

Ficus schefferiana King, Sp. Ficus 2 (1888) 152, t. 192; S. Moore, J. Bot. 63, Suppl. (1925) 111; Corner, Gard. Bull. Singapore 21 (1965) 46.

Tree up to 10 m tall. *Leafy twigs* 4–6 mm thick, appressed-puberulous to glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)obovate or (when juvenile) palmately 3-fid, 6–18(–26) by 2.5–6(–10) cm (when juvenile up to 26 by 10 cm), (sub)coriaceous, apex shortly acuminate, base cuneate to truncate (to subcordate), margin denticulate to entire; upper surface sparsely (on the veins more densely) strigillose, smooth, lower surface sparsely strigillose to puberulous on the veins; cystoliths absent; lateral veins 4–6 pairs, the basal pair (if not running close to the margin) up to 1/3–2/3 the length of the lamina, usually branched, other lateral veins sometimes furcate far from the margin; waxy glands in the axils of the basal lateral veins; petiole (1–)2–4.5 (when juvenile –10) cm long, sparsely strigillose, the epidermis persistent; stipules 1–1.6 cm long, ciliolate and a tuft of hairs at the apex (or with sparse stiff hairs on and along the keel), caducous. *Figs* axillary, in pairs, sessile; basal bracts 3, 1.5–2.5 mm long, ciliolate; receptacle subglobose, (0.7–)1–1.2 cm diam. when dry, sparsely appressed-puberulous, red to crimson at maturity, apex convex, ostiole 1.5–2 mm diam., slightly prominent to impressed; internal hairs sparse, short, white.

Distribution — Sumatra (western and central).

Habitat — Montane (mossy) forest, at altitudes between 1700 and 2500 m.

26. Ficus subfulva Corner

Ficus subfulva Corner, Gard. Bull. Singapore 17 (1960) 432; 21 (965) 47.
Ficus subfulva Corner var. *villosula* Corner, Gard. Bull. Singapore 17 (1960) 432.
Ficus leucoptera auct. non Miq.: King, Sp. Ficus 1 (1887) 157, t. 199; Merr., Enum. Born. (1921) 225.

Tree up to 10(–20) m tall. *Leafy twigs* 3–6 mm thick, sparsely hispidulous, scabrous; periderm persistent. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)obovate, 9–25(–33) by 4–12(–20) cm, subcoriaceous, apex shortly acuminate, base subcordate to cuneate, margin entire or denticulate towards the apex, especially the acumen; upper surface hispidulous, scabrous, lower surface puberulous to hispidulous on the veins, smooth or scabrous; cystoliths absent; lateral veins 4–6 pairs, the basal pair up to 1/2–2/3 the length of the lamina, branched, other lateral veins often branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins; petiole 1–7 cm long, hispidulous, ± scabrous; the epidermis flaking off; stipules 0.7–1.5 cm long, brown appressed-puberulous to subsericeous, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.4–1 cm long; basal bracts 3, 2–4 mm long, brown appressed-puberulous; receptacle globose to ellipsoid, 0.8–1.3 cm diam. when

dry, sparsely to densely brownish appressed-puberulous, orange-red at maturity, apex convex, ostiole 2–2.5 mm diam., flat to slightly prominent, the outer ostiolar bracts densely brown strigillose, ± erect; internal hairs abundant, yellow.

Distribution — Borneo.

Habitat — Lowland and submontane forest, at altitudes up to c. 1000 m.

Notes — 1. This species is uniform and resembles *F. fulva*, from which it can be distinguished by the ± scabrous leafy twigs and petioles with sparse short hairs and the distinctly brown and appressed indumentum of the stipules.

2. This species, though belonging to subsect. *Eriosycea*, also shows strong similarities to *F. androchaete*, belonging to subsect. *Auratae*, in the indumentum and the leaves. The two species can be distinguished by the differences in the basal lateral veins: unbranched and running parallel and close to the leaf margin in *F. androchaete* and usually ± faintly branched, (almost) straight and not running parallel and close to the leaf margin in *F. subfulva*. Moreover, the hairs of the stipules are brown in *F. subfulva* but yellowish in *F. androchaete*.

27. Ficus tricolor Miq.

Ficus tricolor Miq., Pl. Jungh. (1851) 53; Fl. Ind. Bat. 1, 2 (1859) 295; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290; King, Sp. Ficus 2 (1888) 142, t. 179; Kuntze, Rev. Gen. Pl. 1 (1891) 627; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 261; Koord., Atlas Baumart. Java 4 (1918) t. 778; Corner, Gard. Bull. Singapore 21 (1965) 44.

Tree up to 20 m tall. *Leafy twigs* 4–8(–15) mm thick, brownish to whitish hirtellous to strigose to appressed-puberulous; periderm usually persistent. *Leaves* spirally arranged; lamina cordiform to (sub)ovate to elliptic (to oblong to subobovate) (or when juvenile (sub)palmately), 3–7-lobed to -fid, (2–)9–23 by (1–)6–17 cm (when juvenile up to 40 by 35 cm), (sub)coriaceous, apex subacute to shortly acuminate, base cordate to rounded, margin entire (to crenate or denticulate), when dry ± revolute; upper surface appressed-puberulous on the veins and smooth (or hispidulous to hirtellous and scabrous to scabridulous), lower surface densely felted-tomentose, leaving most of the vein reticulations visible, main veins glabrous to sparsely appressed-puberulous or hirtellous; cystoliths absent; lateral veins 5–7 (when juvenile –8), the basal pair up to 1/3–1/2 the length of the lamina, branched, other lateral veins often branched or furcate far from the margin, tertiary venation loosely scalariform (to reticulate in small leaves); waxy glands in the axils of the basal lateral veins, sometimes also in the axils of other lateral veins; petiole (1–)5–13 cm long, brownish to whitish hirtellous to strigose to appressed-puberulous, the epidermis usually persistent; stipules 0.5–1.5 cm long, pale brown subsericeous. *Figs* mostly below the leaves on previous season's growth, in pairs, sessile or mostly with a peduncle 0.2–0.8 cm long; basal bracts 3, 2–3 mm long, white appressed-puberulous; receptacle (depressed-)globose to ellipsoid, 0.5–1.8 cm diam. when dry, sometimes up to 0.3 cm long stipitate, densely to sparsely whitish to brownish puberulous to hirtellous, orange to red at maturity, apex convex, flat or concave, ostiole 3–3.5 mm diam., ± prominent; internal hairs sparse to abundant, white.

Note — *Ficus grossularioides* and *F. tricolor* appear to be very closely related. A combination of more or less clear differences, like in the texture and margin of the

lamina, the indumentum on the leafy twigs, petioles, and both surfaces of the lamina, as well as in the size of the syconia, make it possible to place specimens in one of these two species. However, there are two problem entities, var. *stenoloba* and var. *robusta*. The former is left as an infraspecific taxon in *F. grossularioides*, although with some doubt. The latter was described as a variety of *F. grossularioides*. Corner transferred material initially identified as *F. grossularioides* var. *robusta* to *F. tricolor*, but he did not publish a new combination. The two species appear to be ecologically different as well: *F. grossularioides* is apparently a lowland species, whereas most records indicate that *F. tricolor* occurs at altitudes between 800 and 1900 m; this also applies to var. *robusta* and var. *stenoloba*. Considering the nature of the differences, one could unite the two species and recognize a number of infraspecific taxa at the subgenus and the variety level. The variation in leaf indumentum in *F. tricolor* is parallel to that in *F. grossularioides*.

KEY TO THE VARIETIES

1a. Lamina ± densely hairy and ± scabrous above, the margin denticulate. — Malay Peninsula . . . . . **b.** var. **robusta**
b. Lamina ± sparsely hairy and smooth above, the margin (sub)entire 2
2a. Lower surface of the lamina ± densely hairy on the main veins . . . **c.** var. **serroh**
b. Lower surface of the lamina sparsely puberulous to glabrous on the main veins . . . . . **a.** var. **tricolor**

a. var. **tricolor**

Ficus leucocoma Miq., Pl. Jungh. (1851) 54; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290. — *Ficus tricolor* Miq. var. *leucocoma* (Miq.) King, Sp. Ficus 2 (1888) 143.
Ficus tricolor Miq. forma *pilosior* Miq., Fl. Ind. Bat. 1, 2 (1859) 259.

Lamina mostly oblong to elliptic, margin usually (sub)entire, upper surface sparsely hairy, mainly in the veins, smooth, lower surface sparsely hairy to glabrous on the main veins. *Fig* receptacle 0.5–1 cm diam. when dry, ± sparsely puberulous.

Distribution — Sumatra, Java, Borneo (southern).

Habitat — Forest and secondary growth, at altitudes between 800 and 1900 m.

b. var. **robusta** (Corner) Corner ex C.C. Berg

Ficus tricolor Miq. var. *robusta* (Corner) Corner ex C.C. Berg, Blumea 48 (2003) 544. — *Ficus grossularioides* Burm.f. var. *robusta* Corner, Gard. Bull. Singapore 17 (1960) 429.

Lamina cordiform to ovate (to elliptic), (9–)13–25(–45) by (6–)9–20(–35) cm, base cordate to truncate (to rounded), margin denticulate, upper surface hispidulous to strigillose, scabrous to scabridulous, lower surface with ± appressed or spreading hairs on the main veins. *Fig* receptacle 1–1.8 cm diam. when dry, (rather) sparsely puberulous to subhirtellous.

Distribution — Thailand; in *Malesia*: Malay Peninsula.

Habitat — Forest, at altitudes between 1200 and 1700 m.

c. var. **serroh** Miq.

Ficus tricolor Miq. var. *serroh* Miq., Pl. Jungh. (1851) 53. — *Ficus leucoptera* Miq., Pl. Jungh. (1851) 52; Fl. Ind. Bat. 1, 2 (1859) 295, t. 20A; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 270, 290; King, Sp. Ficus 2 (1888) 157, t. 199; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 260; Koord., Atlas Baumart. Java 4 (1918) t. 777.
Ficus leucoptera Miq. var. *validior* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 270.

Lamina mostly oblong to elliptic, margin usually (sub)entire, upper surface (rather) sparsely hairy, mainly on the veins, smooth, lower surface ± densely hairy on the (main) veins. *Fig* receptacle 0.7–1.3 cm diam. when dry, ± densely hirtellous to puberulous.

Distribution — Sumatra, Java, Celebes, Moluccas (Batjan).

Habitat — Forest, in Sumatra and Java at altitudes between 800 and 2000 m, elsewhere at low altitudes.

Section Eriosycea subsection Auratae

Ficus L. subg. *Ficus* sect. *Eriosycea* (Miq.) Corner subsect. *Auratae* (Corner) C.C. Berg, Blumea 48 (2003) 531. — *Ficus* L. subg. *Ficus* sect. *Ficus* subsect. *Eriosycea* (Miq.) Corner ser. *Auratae* Corner, Gard. Bull. Singapore 17 (1960) 420; Philos. Trans., Ser. B, 259 (1970) 354. — *Ficus* L. subg. *Ficus* sect. *Ficus* subsect. *Eriosycea* (Miq.) Corner subser. *Auratae* Corner, Gard. Bull. Singapore 17 (1960) 420.
Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Eriosycea* (Miq.) Corner ser. *Auratae* Corner subser. *Monandreae* Corner, Gard. Bull. Singapore 17 (1960) 420.

Trees, treelets, or shrubs. *Leaves* sometimes palmately lobed to fid when juvenile. *Tepals* of pistillate flowers 3 or 4 (or 5), white or yellowish, rarely red, setose (in the upper part). *Hairs* at the base of the ovaries and stamens mostly absent.

Distribution — This subsection comprises 13 species, most of them are confined to Borneo, only *F. aurata* extends to Sumatra, Malay Peninsula, and Indochina. The subsection is quite homogeneous.

Note — *Ficus diamantiphylla* Corner differs from the other species in its red-coloured tepals.

28. Ficus androchaete Corner

Ficus androchaete Corner, Gard. Bull. Singapore 17 (1960) 438; 21 (1965) 49; Philos. Trans., Ser. B, 259 (1970) 365, t. 8; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 258.

Tree up to 10 m tall. *Leafy twigs* 3–4 mm thick, sparsely hispidulous to puberulous, often ± scabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)obovate (to oblanceolate), 8–20(–33) by 3.5–9(–13) cm, subcoriaceous (to coriaceous), apex acuminate to subcaudate, base obtuse to rounded (to truncate), margin entire; upper surface appressed-puberulous on the midrib, smooth (or scabridulous), lower surface (rather) sparsely appressed- (to patent-)puberulous on the midrib and usually also the lateral veins or subglabrous; cystoliths absent; lateral veins 4–6 pairs, the basal pair running parallel and close to the margin, up to 1/3–1/2 the length of the lamina, unbranched, tertiary venation loosely (sub)scalariform to reticulate; waxy glands in the axils of the basal lateral veins or also in the axils of other lateral veins; petiole 1–5(–11) cm long, hispidulous to puberulous, the epidermis ± flaking off;

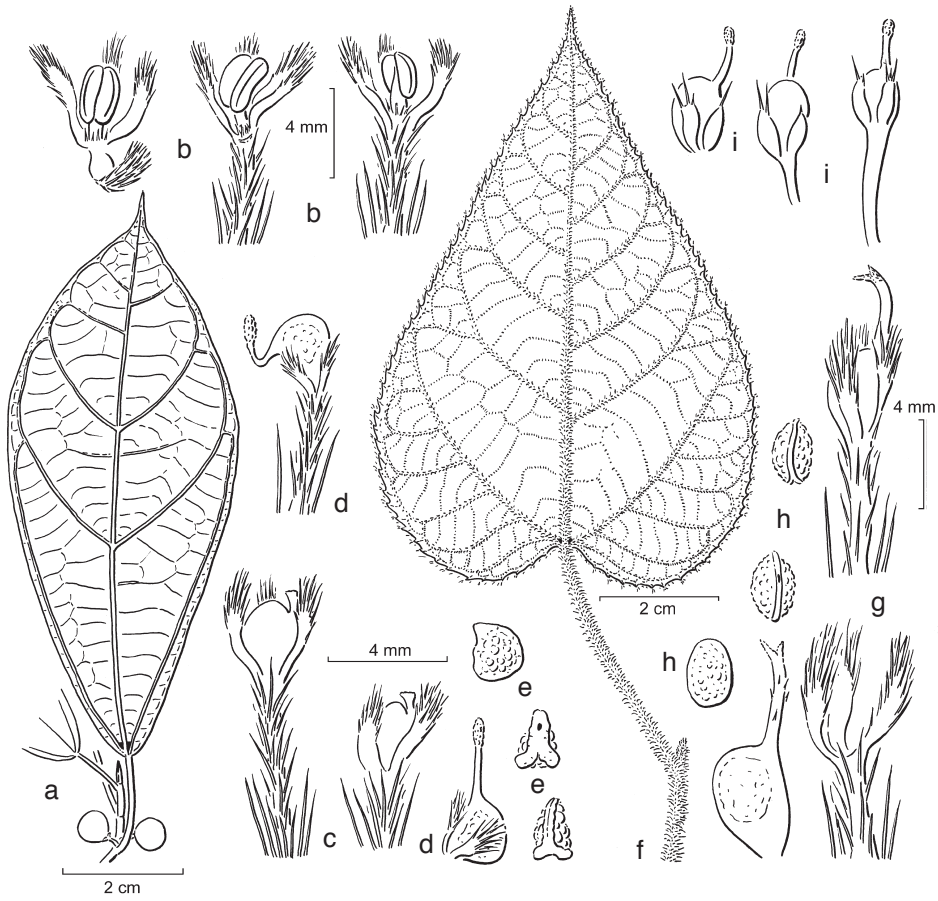


Fig. 30. a–e: *Ficus androchaete* Corner. a. Leafy twig with figs; b. staminate flowers; c. short-styled flowers; d. long-styled flowers; e. fruits. — f–h: *Ficus eumorpha* Corner. f. Leafy twig; g. long-styled flowers and separate pistil; h. fruits. — i: *Ficus subglabritepala* C.C. Berg. Long-styled flowers (a–c: *Brunei 5320*; d, e: *S 22966*; f–h: *SF 27566*; i: *Endert 4417*). From Philos. Trans., Ser. B, 259 (1970) 364.

stipules 0.4–0.8 cm long, yellowish appressed-puberulous to subsericeous, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.2–0.8(–1.2) cm long; basal bracts 3, 1–2 mm long, appressed-puberulous; receptacle subglobose to obovoid to ellipsoid, 1.2–1.5 cm diam. when dry, sometimes up to 0.4 cm long stipitate, rather sparsely puberulous, orange at maturity, apex flat to convex, ostiole 2–2.5 mm diam., slightly prominent to flat; internal hairs abundant. — **Fig. 30a–e.**

Distribution — Borneo.

Habitat — Forest, at altitudes up to 1100.

Note — The species is in many features similar to *F. subfulva*, as discussed under the latter.

29. **Ficus aurata** (Miq.) Miq.

Ficus aurata (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 271, 291; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 254; Corner, Gard. Bull. Singapore 21 (1965) 49; Philos. Trans., Ser. B, 259 (1970) 362, t. 7; Kochummen, Tree Fl. Malaya 3 (1978) 140; Tree Fl. Sabah & Sarawak 3 (2000) 259. — *Covellia aurata* Miq., Fl. Ind. Bat., Suppl. (1861) 433.

Ficus densiserra Miq., Fl. Ind. Bat., Suppl. (1861) 426. — *Ficus aurata* (Miq.) Miq. var. *densiserra* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291.

Ficus chrysocarpa Reinw. ex Blume var. *undulata* H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 365.

Ficus aurata (Miq.) Miq. var. *longipilosa* Corner, Gard. Bull. Singapore 17 (1960) 437.

Ficus aurata (Miq.) Miq. var. *palawanensis* Corner, Gard. Bull. Singapore 17 (1960) 437.

Ficus aurata (Miq.) Miq. var. *pedunculata* Corner, Gard. Bull. Singapore 17 (1960) 438.

Ficus chrysocarpa auct. non Reinw. ex Blume: King, Sp. Ficus 2 (1888) 151, t. 191; Fl. Brit. India 5 (1888) 531; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 365; Gibbs, J. Linn. Soc. Bot. 42 (1914) 137; Merr., Enum. Born. (1921) 221; Ridl., Fl. Malay Penins. 3 (1924) 348; Quisumb., Philipp J. Sci. 41 (1930) 317; Corner, Wayside Trees (1940) 682; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 357; M.F. Barrett, Am. Midl. Nat. 45 (1951) 146.

Shrub or tree up to 10(–15) m tall. *Leafy twigs* 2–5(–8) mm thick, brown hirtellous or puberulous to hirtellous and (setose-)hirsute; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)obovate (to subpandurate or to lanceolate), sometimes 3-lobed, (5–)7–20(–30) by (2–)4–12(–25) cm, chartaceous, apex acuminate (to subacute), base obtuse to subcuneate or to subcordate, margin dent(icul)ate; upper surface hispidulous to hirtellous, ± scabrous, lower surface brown hirtellous on the veins, sometimes to subvelutinous or partly hispidulous or hirsute; cystoliths absent; lateral veins (4–)5–7(–12) pairs, basal pair running almost parallel to the margin, up to 1/3–1/2 the length of the lamina, often not or only faintly branched, other lateral veins often branched or furcate far from the margin, tertiary venation loosely scalariform to almost reticulate; waxy glands if present inconspicuous and in the axils of the basal lateral veins; petiole 0.5–5(–16) cm long, hirtellous to hirsute, the epidermis persistent; stipules 0.5–1.5(–2) cm long, brownish substrigose to subsericeous, caducous. *Figs* axillary or below the leaves on previous season's growth, in pairs, sessile or with a peduncle up to 0.4 cm long; basal bracts 3, 2–3.5 mm long, appressed-puberulous to strigillose; receptacle subglobose to ellipsoid (to ovoid), 1–1.2(–1.8) cm diam. when dry, 1.5–2.2 cm diam. when fresh, hirtellous to hirsute to subhispidulous, red at maturity, apex convex to slightly protracted, ostiole c. 3 mm diam., slightly prominent; internal hairs abundant.

Distribution — Malay Peninsula, Sumatra (incl. Riouw Archipelago and Banka), Borneo, Philippines (Balabac, Palawan).

Habitat — Forest and common in secondary growth, at altitudes up to 1400 m.

Notes — 1. The species is variable with regard to the indumentum (denseness, length, and colour of the hairs), the size of the fig receptacle, and the presence of a peduncle. Lateral bracts are occasionally present.

2. In the Malay Peninsula and Vietnam various parts, including the fig receptacle, are covered by dense short indumentum (velutinous), often rather pale in colour. The figs of material with such indumentum can be pedunculate in the Malay Peninsula.

3. Material from Palawan (Philippines) described as var. *palawanensis* has thick leafy twigs and large, sometimes 3-lobed laminas on long petioles. Investigation of more material may lead to recognition of a distinct (infraspecific) taxon.

30. **Ficus aureocordata** Corner

Ficus aureocordata Corner, Gard. Bull. Singapore 19 (1962) 385; 21 (1965) 49.

Shrub. *Leafy twigs* 5–6 mm thick, densely pale brown puberulous, with pairs of waxy glands at the bases of the petioles, hollow; periderm persistent. *Leaves* spirally arranged; lamina cordiform, 23–33 by 18–21 cm, chartaceous, apex acuminate, base cordate, margin dentate; upper surface strigillose, on the main veins puberulous, ± scabrous, the lower surface hirtellous on the veins; cystoliths absent; lateral veins 5 or 6 pairs, the basal pair up to c. 1/2 the length of the lamina, branched, other most lateral veins branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins or also in the axils of other lateral veins; petiole 4.5–12 cm long, puberulous, the epidermis persistent; stipules c. 1.5 cm long, pale brown subsericeous, caducous. *Figs* axillary, in pairs, sessile; basal bracts 3, 4–5 mm long, yellow subsericeous; receptacle ellipsoid to subglobose, c. 2 cm diam. when dry, puberulous and brown hirtellous to subvillous, colour at maturity unknown, apex convex to slightly protracted, ostiole c. 3 mm diam., surrounded by some bracts with dense stiff dark brown hairs, or one or two of them sublateral; internal hairs abundant, yellowish.

Distribution — Borneo (western and central).

Habitat — Montane forest, at altitudes between 1000 and 1250 m.

31. **Ficus auricoma** Corner ex C.C. Berg

Ficus auricoma Corner ex C.C. Berg, Blumea 48 (2003) 533.

Tree c. 13 m tall. *Leafy twigs* 5–7 mm thick, yellowish puberulous to hirtellous and densely yellow-brown (sub)hirsute; periderm persistent. *Leaves* spirally arranged; lamina broadly elliptic, 14–20 by 9–14 cm, chartaceous, apex acuminate, base rounded, margin denticulate; upper surface ± densely yellow hirtellous to puberulous on the veins, smooth, lower surface densely yellow-brown subvelutinous on the veins; cystoliths absent; lateral veins 5 or 6 pairs, basal pair up to 1/2–2/3 the length of the lamina, branched, other lateral veins sometimes branched or furcate far from the margin, tertiary venation (loosely) scalariform; waxy glands in the axils of the basal lateral veins; petiole 2–4.5 cm long, yellow-brown subvelutinous, the epidermis persistent; stipules c. 1 cm long, yellow-brown subhirsute, caducous. *Figs* below the leaves on previous season's growth, in pairs, sessile; basal bracts 3, 4–5 mm long, yellow appressed-puberulous; receptacle subglobose to ovoid, 1.2–1.5 cm diam. when dry, yellow-brown subvelutinous, colour at maturity unknown, apex convex, ostiole c. 4 mm diam., slightly prominent, the outer ostiolar bracts densely strigillose, ± erect; internal hairs abundant, whitish.

Distribution — Borneo (Sarawak)

Habitat — Submontane forest, at 1000 m.

Notes — 1. The species shows affinities to *F. bruneiensis* from which it differs, e.g., in the smooth upper surface of the lamina, shorter petioles and stipules, and longer basal bracts.

2. This species shows remarkable overall similarities to *F. mollissima*, a member of subsect. *Eriosycea*.

32. Ficus bruneiensis Corner

Ficus bruneiensis Corner, Gard. Bull. Singapore 17 (1960) 435; 21 (1965) 48; Philos. Trans., Ser. B, 259 (1970) 363, t. 4; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 263, t. 6.

Tree up to 13 m tall. *Leafy twigs* 6–10(–12) mm thick, ± densely minutely puberulous, with pairs of waxy glands at the bases of the petioles, hollow; periderm persistent. *Leaves* spirally arranged; lamina elliptic to ovate, (11–)28–45 by (7–)16–28 cm, chartaceous (brittle when dry), apex shortly acuminate, base cordate to rounded, margin denticulate; upper surface hirtellous to subhirsute to substrigose, ± scabrous, lower surface densely minutely white puberulous on the veins and in the areoles, on the veins also brown subhirsute to hirtellous; cystoliths absent; lateral veins 5–7 pairs, the basal pair up to 1/2–2/3 the length of the lamina, branched, tertiary venation scalariform; waxy glands in the axils of the (main) basal lateral veins and in those of the other lateral veins; petiole (3–)6–18 cm long, densely minutely puberulous and also sparsely subhirsute, the epidermis persistent; stipules 2–6 cm long, finely white sericeous on the keel and also with longer stiff brown hairs, caducous. *Figs* axillary, in pairs, sessile; basal bracts 3, 0.6–1 cm long, densely minutely appressed-puberulous, caducous; receptacle ovoid to subglobose, 2–3 cm diam. when dry, densely brown hirsute, red at maturity, apex convex to protracted, ostiole 3–4 mm diam., surrounded by 5 cushion-shaped processes; internal hairs abundant, yellowish.

Distribution — Borneo.

Habitat — Forest, along streams, at low altitudes.

Note — Similarities in the indumentum of the lower surface of the lamina and the stipules, indicate this species is related to *F. brunneoaurata* and *F. eumorpha*.

33. Ficus brunneoaurata Corner

Ficus brunneoaurata Corner, Gard. Bull. Singapore 17 (1960) 436; 21 (1965) 48; Philos. Trans., Ser. B, 259 (1970) 354, t. 6; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 263.

Tree up to 16 m tall, becoming buttressed. *Leafy twigs* 3–7(–10) mm thick, densely minutely puberulous and brown hirsute, with pairs of (often inconspicuous) waxy glands at the bases of the petioles, solid; periderm persistent. *Leaves* spirally arranged; lamina subovate to oblong (when juvenile palmately 3–5-lobed to -fid), (7–)13–30 by (3–)6–14 cm (when juvenile up to 50 by 45 cm), chartaceous to subcoriaceous, apex acuminate to subacute, base cordate to rounded, margin dent(icul)ate (or subentire); upper surface yellow strigose, ± scabrous (to smooth), lower surface densely minutely puberulous on the veins and in the areoles, also brownish subhirsute to hirtellous on the veins; cystoliths absent; lateral veins 4–7(–8) pairs, the basal pair up to 1/3–1/2 the length of the lamina, often branched, tertiary venation scalariform; waxy glands in

the axils of the basal lateral veins; petiole 1–6 cm long, minutely puberulous and also (sub)hirsute; stipules 1–3.5 cm long, densely yellow to brownish appressed-puberulous to sericeous and also longer stiff brown hairs on the keel, caducous. *Figs* axillary and below the leaves on previous season's growth, in pairs or solitary, sessile; basal bracts 3, 1–1.5 mm long, puberulous, persistent; receptacle subglobose to ellipsoid, 1–1.6 cm diam. when dry, 1.3–2 cm diam. when fresh, densely to sparsely puberulous or sometimes also with longer stiff brown hairs, red at maturity, apex ± convex, ostiole c. 2 mm diam., often surrounded by a rim, sometimes by 5 short ribs; internal hairs abundant, brownish.

Distribution — Borneo.

Habitat — Forest or secondary growth, at altitudes up to 1100 m.

Note — The similarities in the indumentum of the lower surface of the lamina and the stipules, indicate that this species is related to *F. bruneiensis* and *F. eumorpha*.

34. Ficus diamantiphylla Corner

Ficus diamantiphylla Corner, Philos. Trans., Ser. B, 259 (1970) 368, t. 14; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 272.

Tree up to c. 7 m tall. *Leafy twigs* 6–10 mm thick, brown to yellowish strigose to subhirsute, the stiff hairs intermixed with much shorter patent white hairs, without waxy glands, hollow; periderm flaking off. *Leaves* spirally arranged; lamina obovate to subpandurate, 40–50 by 20–26 cm, chartaceous (brittle when dry), apex shortly acuminate, base cordate to rounded, margin denticulate; upper surface hirtellous, ± scabridulous, lower surface white puberulous, on the larger veins also yellowish to brownish hirtellous to subhirsute, scabridulous; cystoliths absent; lateral veins 8–10 pairs, the basal pair up to 1/6–1/4 the length of the lamina, branched, tertiary venation scalariform; waxy glands in the axils of the (main) basal lateral veins and in those of the other lateral veins; petiole 3–10 cm long, densely minutely brownish puberulous and also brown hirsute, the epidermis persistent; stipules 2–6 cm long, finely white sericeous and towards the keel also brown to yellowish subsericeous to strigose, caducous. *Figs* axillary, in pairs (?), sessile; basal bracts 3, 3–5 mm long, appressed-puberulous (?), persistent; receptacle ellipsoid, 1.3–1.4 cm diam. when dry, densely brown hirtellous to subhirsute, colour at maturity unknown, apex protracted, ostiole c. 3 mm diam.; internal hairs abundant, whitish. — **Fig. 31.**

Distribution — Borneo (Sarawak).

Habitat — Forest, along streams, at low altitudes.

35. Ficus endospermifolia Corner

Ficus endospermifolia Corner, Gard. Bull. Singapore 17 (1960) 434; 21 (1965) 48; Philos. Trans., Ser. B, 259 (1970) 363, t. 4, 5; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 273.

Tree up to 25 m tall. *Leafy twigs* (4–)6–10 mm, brownish hirtellous, with waxy glands in pairs at the bases of the petioles, solid; periderm persistent. *Leaves* spirally arranged; lamina cordiform to subrotundate (or ovate, when juvenile 3–7-lobed to -fid), 9–27 by 8.5–25 cm (when juvenile up to 40 by 40 cm), chartaceous to subcoriaceous,

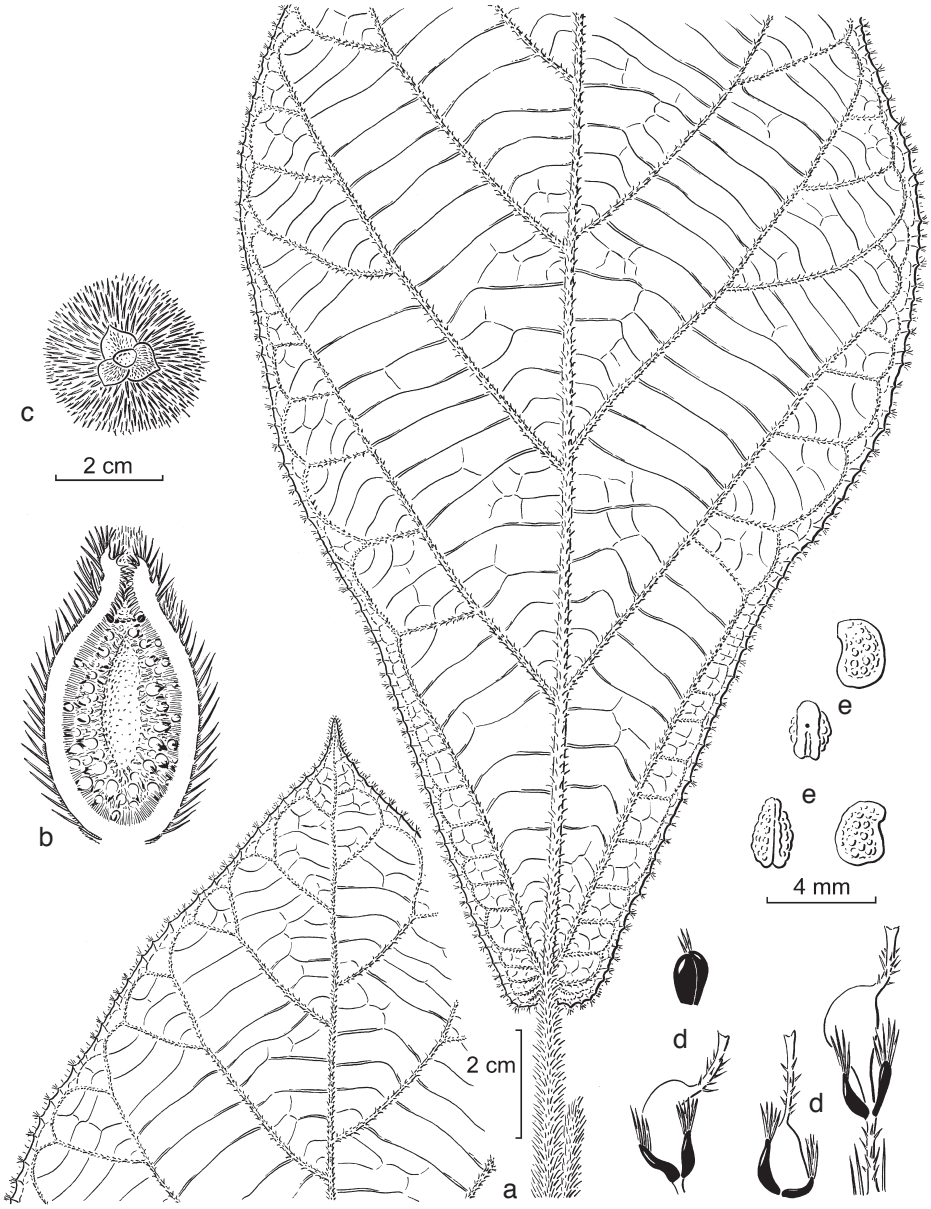


Fig. 31. *Ficus diamantiphylla* Corner. a. Leaf; b. fig; c. basal bract; d. long-styled flowers; e. fruits (all: *M. Hotta 12879*). From Philos. Trans., Ser. B, 259 (1970) 369.

apex shortly acuminate, base cordate to subtruncate to rounded, margin serrate-denticulate; upper surface hirtellous, scabridulous, lower surface hirtellous to subvelutinous on the veins; cystoliths absent; lateral veins 4 or 5 pairs, the basal pair up to 1/2–2/3 the length of the lamina, branched, other lateral veins mostly branched or furcate far from

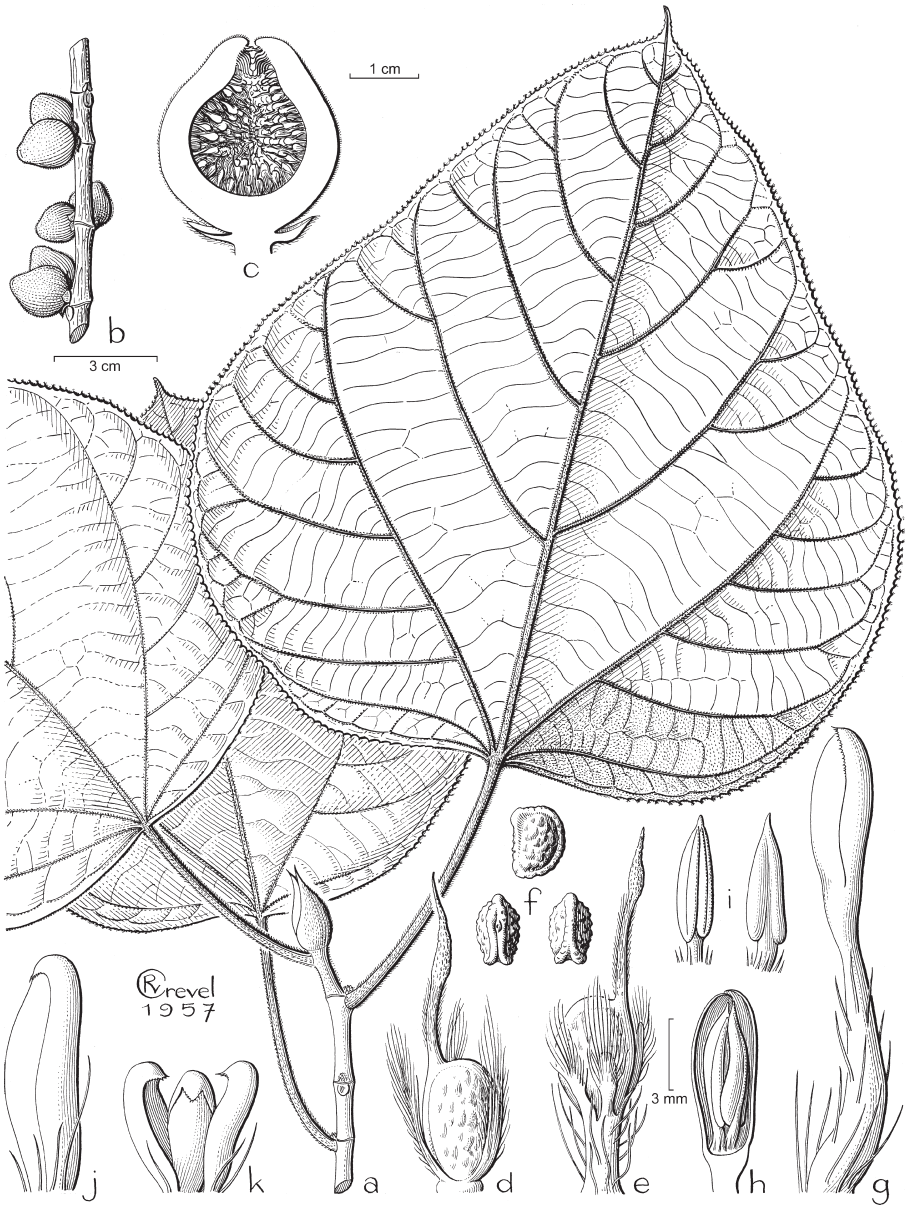


Fig. 32. *Ficus endospermifolia* Corner. a. Leafy twig; b, c. figs; d, e. long-styled flowers; f. fruits; g, h. staminate flowers; i. stamens; j, k. neuter flowers (a–f, j, k: *SF 27842*; g–i: *Clemens 34381*).

the margin, tertiary venation scalariform; waxy glands absent on the lamina; petiole 3.5–10 (when juvenile –30) cm long, densely hirtellous (to subvelutinous), the epidermis persistent; stipules (0.8–)1.5–2.5(–3) cm long, brown hirtellous to subsericeous, caducous. *Figs* axillary and below the leaves on previous season's growth, solitary (or

in pairs?), sessile; basal bracts 3, 3–5 mm long, appressed-puberulous; receptacle ovoid to ellipsoid to subglobose, (1.3–)1.5–2.5 cm diam. when dry, 2.3–3 cm diam. when fresh, densely brown puberulous (to subvelutinous), colour at maturity unknown, apex convex to slightly protracted, ostiole c. 2.5 mm diam., flat to ± prominent; internal hairs abundant, yellow. — **Fig. 32.**

Distribution — Borneo (northern).

Habitat — Forest and common in secondary growth, at altitudes between 1000 and 1800 m.

36. Ficus eumorpha Corner

Ficus eumorpha Corner, Gard. Bull. Singapore 17 (1960) 439; 21 (1965) 49; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 273.

Shrub or tree up to 18 m tall. *Leafy twigs* 3–5 mm thick, brown hirtellous to subvelutinous, the hairs ± echinate at the base; periderm persistent. *Leaves* spirally arranged; lamina cordiform to ovate (when juvenile 3-lobed), 8–21 by 6.5–15 cm, chartaceous, apex shortly acuminate to subacute, base (sub)cordate, margin dentate; upper surface hirtellous, ± bullate, ± scabrous, lower surface densely minutely puberulous on the veins and in the areoles, and on the veins also brown to almost white hirtellous (to subvelutinous), on the main veins part of the hairs tufted; cystoliths absent; lateral veins 5–7 pairs, the basal pair up to 1/3–1/2 the length of the lamina, branched, other lateral veins usually branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins; petiole 4–8 (when juvenile –11) cm long, brown hirtellous to subvelutinous, the epidermis persistent; stipules 0.5–1(–1.5) cm long, brown hirtellous to substrigose, caducous. *Figs* axillary, in pairs, sessile; basal bracts 3, 3–5 mm long, brown subsericeous; receptacle subglobose to ellipsoid, 1.6–1.8 cm diam. when dry, 1.8–2 cm diam. when fresh, densely brown hirtellous to subvelutinous, colour at maturity unknown, ostiole c. 3 mm diam., surrounded by dark brown hairy firm bracts; internal hairs abundant, yellowish. — **Fig. 30f–h.**

Distribution — Borneo.

Habitat — Montane forest, at altitudes between 1300 and 2000 m.

Note — The similarities in the indumentum of the lower surface of the lamina and the stipules indicate that this species is related to *F. brunneoaurata* and *F. bruneiensis*.

37. Ficus inaequipetiolata Merr.

Ficus inaequipetiolata Merr., Philipp. J. Sci. 21 (1922) 517.

Ficus paramorpha Corner, Gard. Bull. Singapore 17 (1960) 440; 21 (1965) 49; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 296.

Ficus aurata (Miq.) Miq. var. *brevipilosa* Corner, Gard. Bull. Singapore 17 (1960) 437.

Shrub or tree up to 6(–13) m. *Leafy twigs* 2–7 mm thick, brown puberulous to hispidulous (to hirtellous or to glabrous), sometimes with pairs of (inconspicuous) waxy glands at the bases of the petioles; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)obovate to linear-lanceolate (4–)6–21(–30) by (1.5–)4–10 cm, chartaceous to subcoriaceous, apex acuminate, base cuneate to obtuse (to subtrun-

cate), margin dent(icul)ate; upper surface (rather) sparsely hispidulous to strigillose, on the midrib to brown puberulous, scabrous, lower surface sparsely to densely brown hirtellous to subhispid to hispidulous to puberulous on the veins, ± scabrous; cystoliths absent; lateral veins 4–7 (in narrow leaves –12) pairs, the basal pair running close to the margin, up to 1/4–1/3 (in narrow leaves up to 1/8) the length of the lamina, unbranched, tertiary venation loosely scalariform (to almost reticulate); waxy glands in the axils of the basal lateral veins; petiole (0.5–)1–3.5 cm long, sparsely to densely puberulous, the epidermis persistent; stipules 0.4–1.7 cm long, (dark) brown (sub)sericeous, caducous. *Figs* axillary, in pairs (or solitary), sessile; basal bracts 3, c. 2 mm long, brown appressed-puberulous; receptacle subglobose to ellipsoid, 0.8–1.5 cm diam. when dry, (rather) sparsely brown(ish) appressed-puberulous to hispidulous, yellow to orange at maturity, apex convex, ostiole 2–2.5 mm diam., ± prominent, the outer ostiolar bracts densely brown strigillose, often erect; internal hairs abundant, yellowish.

Distribution — Borneo (Sabah, Sarawak, Kalimantan: Sampit region).

Habitat — Forest, often on hillsides and hilltops, at altitudes up to 1300(–2300) m.

Notes — 1. Most collections have been made in Sabah.

2. The type collection of *F. paramorpha*, made at an altitude of 2300 m, is hardly different from the collections made at low altitudes.

3. The same branch often has leaves with oblong to elliptic and linear-lanceolate laminas.

38. Ficus macilenta King

Ficus macilenta King, Sp. Ficus 2 (1888) 155, t. 196; Merr., Enum. Born. (1921) 225; Corner, Gard. Bull. Singapore 21 (1965) 49; Philos. Trans., Ser. B, 259 (1970) 362, t. 9, 10, 11; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 284.

Ficus gibbsiae Ridl., J. Linn. Soc. Bot. 42 (1915) 137; Merr., Enum. Born. (1921) 223. — *Ficus macilenta* King var. *gibbsiae* (Ridl.) Corner, Gard. Bull. Singapore 17 (1960) 439.

Ficus macilenta King var. *ilicifolia* Corner, Gard. Bull. Singapore 17 (1960) 439.

Shrub or treelet up to 5 m tall. *Leafy twigs* 2–3 mm thick, subglabrous or brownish hirtellous; periderm persistent. *Leaves* spirally arranged (to subdistichous); lamina elliptic to oblong to lanceolate (or to ± rhombic), (2–)6–15(–18) by 2–7(–9) cm, (sub)coriaceous, apex acuminate, base cuneate to obtuse, margin irregularly ± coarsely dentate to lobed; upper surface sparsely hispidulous, scabridulous or (sub)glabrous and smooth, lower surface puberulous to subhispidulous or to hirtellous, on the veins scabridulous or (sub)glabrous and smooth; cystoliths absent; lateral veins 4–8(–9) pairs, the basal pair running close to the margin, up to 1/4 the length of the lamina, unbranched, other lateral veins often furcate far from the margin, tertiary venation loosely subscalariform, ± prominent beneath; waxy glands on the midrib at the bases of the basal lateral veins; petiole 1–3.5(–5) cm long, glabrous or brown hirtellous, the epidermis persistent; stipules 0.4–0.8 cm long, white subsericeous, caducous. *Figs* axillary, in pairs, subsessile or with a peduncle up to 0.4 cm long; basal bracts 3, 1–1.5 mm long, appressed-puberulous; receptacle (sub)globose, 0.6–1 cm diam. when dry, subglabrous or appressed-puberulous to brown hirtellous, red at maturity, apex slightly convex, ostiole c. 2 mm diam., flat to slightly prominent; internal hairs abundant, white.

Distribution — Borneo.

Habitat — Montane (mossy, e.g., Ericaceae) forest, at altitudes between 800 and 2000 m.

Note — The species varies somewhat in the presence and type of indumentum, the shape of the lamina, and in the presence of the peduncle.

39. Ficus setiflora Stapf

Ficus setiflora Stapf, Trans. Linn. Soc. London, Bot. 4 (1894) 226, t. 18 B, t. 5–8; Merr., Enum. Born. (1921) 227; Corner, Gard. Bull. Singapore 21 (1965) 50; Philos. Trans., Ser. B, 259 (1970) 363, t. 12, 13; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 304.
Ficus setiflora Stapf var. *adelpha* Corner, Gard. Bull. Singapore 17 (1960) 440.
Ficus setiflora Stapf var. *puberula* Corner, Gard. Bull. Singapore 17 (1960) 441.

Shrub or treelet up to 7 m tall. *Leafy twigs* 1.5–2 mm thick, ± densely brown to yellowish puberulous to subvelutinous (or rather sparsely appressed-puberulous); periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic to subobovate or to lanceolate, (2–)6–14 by (1.2–)2.5–6.5 cm, chartaceous, apex acuminate to subacute, base cuneate to obtuse (to subcordate), margin (often ± irregularly) serrate-dentate; upper surface ± sparsely hispidulous and on the midrib densely puberulous, scabridulous to scabrous, lower surface densely to rather sparsely appressed- to patent-puberulous to subvelutinous; cystoliths absent; lateral veins (4–)5–8(–9) pairs, the basal pair running close to the margin, up to 1/3–1/2 the length of the lamina, mostly unbranched, other lateral veins often branched or furcate far from the margin, tertiary venation scalariform to almost reticulate; waxy glands in the axils of the basal lateral veins; petiole 1–4 cm long, ± densely puberulous to subvelutinous, the epidermis persistent; stipules 0.5–0.9 cm long, pale brown to yellowish (sub)sericeous, caducous. *Figs* axillary or also below the leaves on previous season's growth, in pairs, (sub)sessile or with a peduncle up to 0.3 cm long; basal bracts 3, 0.5–1.5 mm long, appressed-puberulous; receptacle subglobose to ellipsoid to obovoid, 0.5–0.9 cm diam. when dry, sparsely to densely (minutely) whitish to yellowish appressed-puberulous, red (to purplish) at maturity, apex convex to flat, ostiole 1–2 mm diam., flat to ± prominent, the outer ostiolar bracts densely brown(ish) strigillose; internal hairs abundant.

Distribution — Borneo (northern).

Habitat — Montane forest, at altitudes between 1100 and 2500 m.

Note — The species is rather variable in the denseness of indumentum and in the shape of the lamina.

40. Ficus subglabritepala C.C. Berg

Ficus subglabritepala C.C. Berg, Blumea 48 (2003) 543.
Ficus eumorpha Corner var. *subglabra* Corner, Gard. Bull. Singapore 17 (1960) 440.

Tree up to 10 m tall. *Leafy twigs* 3–4 mm thick, puberulous and densely brownish hirtellous to subvelutinous, with pairs of waxy glands at the bases of the petioles; periderm persistent. *Leaves* spirally arranged; lamina cordiform to ovate, sometimes 3-lobed, 6–16 by 3.5–9.5 cm, chartaceous, apex acuminate to subcaudate, base (sub)cordate,

margin (and acumen) dentate; upper surface densely hirtellous to subhispid, ± scabrous, lower surface densely yellow to brown hirtellous on the veins; cystoliths absent; lateral veins 4–7 pairs, basal pair branched, up to 1/4–1/3 the length of the lamina, other lateral veins often branched or furcate far from the margin, tertiary venation loosely scalariform; waxy glands in the axils of the basal lateral veins; petiole 1.2–7 cm long, densely brown(ish) hirtellous, the epidermis persistent; stipules 0.4–0.6 cm long, yellow to brown subsericeous to subhirtellous, caducous. *Figs* in pairs or solitary, sessile; basal bracts 3, c. 2 mm long, appressed-puberulous; receptacle subglobose, 1–1.2 cm diam. when dry, densely yellow to brown(ish) hirtellous to subvelutinous, yellowish at maturity, apex convex, ostiole c. 2.5 mm diam., ± prominent; internal hairs abundant, yellow. — **Fig. 30i.**

Distribution — Borneo (Sarawak, Central Kalimantan).

Habitat — Montane and submontane (mossy) forest, at altitudes between 1500 and 1800 m.

Note — This species resembles *F. eumorpha* in the shape of the lamina, but differs in the absence of dense minute whitish hairs covering the areoles, the indumentum of the stipules with only one type of hairs, and the smaller fig receptacle with pale brown indumentum. Moreover, the tepals of the pistillate flowers bear only few hairs or are glabrous.

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FICUS subgenus PHARMACOSYCEA

Ficus L. subg. *Pharmacosycea* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 299; Corner, Gard. Bull. Singapore 17 (1960) 405; Philos. Trans., Ser. B, 259 (1970) 383. — *Pharmacosycea* Miq., London J. Bot. 6 (1847) 525; 7 (1848) 64. — *Ficus* L. sect. *Pharmacosycea* (Miq.) Benth. & Hook. f., Gen. Pl. 3 (1880) 369.

Trees (or shrubs), terrestrial, monoecious. *Leaves* spirally arranged or (sub)distichous; lamina coriaceous to chartaceous, margin entire, sometimes (in juvenile or adult specimens) lobate or dentate; cystoliths on both sides or only beneath, venation scalariform to reticulate to largely parallel to the lateral veins, the basal lateral veins often not distinct in length and angle of departure; waxy glands in the axils of the basal lateral veins, rarely also in the axils of other lateral veins; stipules fully amplexicaul, often relatively long. *Figs* in pairs or solitary, rarely 2 or 3 clustered, usually axillary, rarely cauliflorous on leafless branchlets; basal bracts usually 3, rarely 1 or 2 or none, mostly verticillate, sometimes scattered on the peduncle; lateral bracts occasionally present; receptacle stipitate or not; ostiole circular, closed by 3–5 bracts; interfloral bracts usually present, often sparse; internal hairs absent or present; receptacle containing staminate flowers and both long- and short-styled flowers, with (2–)3–5(–6) free or connate tepals, these red(dish) and usually glabrous; ostiole closed by 3–5 bracts. *Staminate flowers* disperse or ostiolar, (2–)3–5(–6) connate or free tepals; stamens 1, 2, or 3; anthers apiculate or not; pistillodes often present, subulate. *Ovaries* whitish or reddish; stigmas 2, of equal or unequal length, sometimes 1. *Fruits* ellipsoid, smooth.

Distribution — From West Africa to New Caledonia and in the Neotropics; c. 70 species, of which c. 25 neotropical and 23 in Malesia.

Morphology — In general, sect. *Pharmacosycea* is less variable in its features than sect. *Oreosycea*. Moreover, the general features of the former section are more similar to those of subg. *Urostigma* than to those of sect. *Oreosycea*. The characters and the variation patterns of the latter section show to some extent similarities to the dioecious subdivisions of *Ficus*, as in the irregularities of the basal bracts, development of a stipe below the fig receptacle, variation in the length of petioles on the same twig, texture of the lamina, occurrence of lobate laminas, occurrence of hairs inside the fig receptacle, occurrence of (sub)distichous leaves, in the position of the leaves, and the presence of cauliflory, pachyclady (or pachycauly sensu Corner), and hollow internodes.

The species are terrestrial and often produce trees of considerable height, often with buttresses. This may be the reason that several of these species are poorly represented in herbarium collections. Quite a different life form, resembling that found in subg. *Sycidium* sect. *Palaeomorphe* is described for the neotropical species *F. crassiuscula* Standl. (Daniels & Lawton 1991).

The basal bracts are in some species not verticillate but scattered on the peduncle, as normal in subg. *Sycidium*. Such bracts are indicated as peduncular bracts in subg. *Sycidium*, but in sect. *Oreosycea* still as basal bracts. Moreover, the number of basal bracts may be less than the normal three.

Subdivision — The subgenus comprises two sections, a Palaeotropical one, sect. *Oreosycea* (with c. 45 species) and a neotropical one, sect. *Pharmacosycea* (with c. 25 species). The sections show strong morphological affinities: similarities in char-

acters and in differentiation patterns. The similarities are most pronounced between the eastern Malesian *F. nervosa*-group and the neotropical section. The characters differentiating sect. *Oreosycea* and sect. *Pharmacosycea* are rather weak and include: leaves sometimes (sub)distichous versus always spirally arranged; lamina always coriaceous to chartaceous and sometimes with a lobate or dentate margin versus always coriacous and with an entire margin; figs usually in pairs versus usually solitary; fig receptacle often stipitate versus non-stipitate; pluricellular oblongoid-capitate hairs (if present) brownish with few cells versus whitish with more cells; stamens 1–3 and rather small versus 2 and large; the perianth of the staminate flower usually tubular versus usually with free tepals; figs at maturity often red versus mostly green, However, close relationship between the two sections is not supported by molecular analyses (Herre et al. 1996; Weiblen 2000). Moreover, the fig wasp genus *Tetrapus*, which is the genus of pollinators of sect. *Pharmacosycea* has an isolated taxonomic position as well (see Wiebes 1994).

The subdivision of the subgenus is as follows:

Subg. *Pharmacosycea*
- Sect. *Pharmacosycea*
- Sect. *Oreosycea*
  - Subsect. *Glandulosae*
    - *Ficus austrocaledonica*-group
    - *Ficus nervosa*-group
  - Subsect. *Pedunculatae*
    - *Ficus albipila*-group
    - *Ficus vasculosa*-group

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Section Oreosycea

Ficus L. subg. *Pharmacosycea* (Miq.) Miq. sect. *Oreosycea* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Corner, Gard. Bull. Singapore 17 (1960) 406.— *Urostigma* Gasp. sect. *Oreosycea* Miq., London J. Bot. 6 (1847) 525, 585; Fl. Ind. Bat. 1, 2 (1859) 353.— *Ficus* L. sect. *Leiosycea* Miq., London J. Bot. 7 (1848) 454; Fl. Ind. Bat. 1, 2 (1859) 315.

Leaves spirally arranged to distichous; lamina coriaceous to chartaceous, margin entire or sometimes lobate or dentate. *Figs* mostly in pairs, usually axillary, rarely cauliflorous; basal bracts 3, rarely less or none; receptacle often stipitate; internal hairs absent or present. *Staminate flowers* ostiolar or disperse. *Tepals* red(dish). *Stamens* 1 or 2 (or 3).

Distribution — From West Africa and Madagascar to Fiji and New Caledonia with c. 55 species.

Morphology — The bristle-like hairs found in some species on the inner surface of the receptacle or on the pedicels are quite distinct from the thin hairs occurring on other parts of the plant.

Pollinators — The species of sect. *Oreosycea* are pollinated by fig wasps of the genus *Dolichoris* (Wiebes, Verh. Kon. Ned. Akad. Wet., afd. Natk., 2de reeks, 1994).

Subdivision — The section can be subdivided into two well-defined subsections with different centres of distribution.

KEY TO THE PALAEOTROPICAL SUBSECTIONS

1a. Waxy glandular spots absent . . . . . Subsect. **Pedunculatae**
b. Waxy glandular spots present in the axils of the basal lateral veins beneath . . . . . Subsect. **Glandulosae**

KEY TO THE SPECIES

1a. Lamina glabrous beneath 2
b. Lamina hairy beneath, at least sparsely so on the midrib 18
2a. Tertiary venation of the lamina scalariform 3
b. Tertiary venation of the lamina reticulate to subscalariform (with one or few transverse veins in the intercostal area) to partly or largely parallel to the lateral veins 4
3a. Lamina scabridulous beneath, greenish and shining above when dry; figs pedunculate. — Malay Peninsula, Sumatra, Java, Borneo, Philippines, Celebes, Lesser Sunda Islands, Moluccas . . . . . **22. F. callosa**
b. Lamina smooth beneath, dull and brownish above when dry; figs sessile. — Philippines . . . . . **3. F. gigantifolia**
4a. Tertiary venation largely parallel to the lateral veins (with 1–3 secondary lateral veins between the primary ones). — New Guinea (incl. Admiralty Islands) . . . . . **19. F. subtrinervia**
b. Tertiary venation reticulate to subscalariform or to partly parallel to the lateral veins 5
5a. Stipules 0.4–1.5 cm long 6
b. Stipules (1–)1.5–7.5 cm long 14
6a. Waxy glands absent; lamina (usually) drying greenish and shining above 7
b. Waxy glands present in the axils of the basal lateral or the second pair of lateral veins; lamina drying brownish and dull above. — Celebes, Moluccas, and/or New Guinea 8
7a. Leafy twigs and stipules glabrous; petiole 0.5–1 mm thick; fig receptacle 0.5–1 cm diam. when dry. — Malay Peninsula, Sumatra, Java, Borneo . . . **23. F. vasculosa**
b. Leafy twigs and stipules minutely puberulous; petiole 1–1.5 mm thick. — Philippines . . . . . **21. F. bataanensis**

8a. Waxy glands in the axils of the second pair of lateral veins. — Celebes . . . . . **8. F. kjellbergii**
b. Waxy glands in the axils of the basal lateral veins 9
9a. Basal lateral veins clearly different from the other lateral veins, departing at a more acute angle. — Celebes, Moluccas, New Guinea . . . . **6. F. hombroniana**
b. Basal lateral veins not or hardly different from the other lateral veins. — New Guinea 10
10a. Apex of the lamina subcaudate; lamina often ± asymmetric . **17. F. subcaudata**
b. Apex of the lamina shortly acuminate to obtuse; lamina (almost) symmetric . 11
11a. Stipules brownish appressed-puberulous to subsericeous 12
b. Stipules glabrous 13
12a. Lateral veins (8–)10–14 pairs; lamina usually longer than 10 cm **2. F. edelfeltii**
b. Lateral veins 7–9 pairs; lamina shorter than 10 cm . . . . . **16. F. sclerosycia**
13a. Petiole (0.5–)1–2.5 cm long; stipules (0.5–)1–2.8 cm long; fig receptacle (0.7–)1–2 cm diam. when dry . . . . . **18. F. subnervosa**
b. Petiole 0.4–1(–1.3) cm long; stipules 0.5–1.2 cm long; fig receptacle 0.4–0.5 cm diam. when dry . . . . . **7. F. ihuensis**
14a. Lateral veins of the lamina (8–)10–17 pairs 15
b. Lateral veins of the lamina 7–10 pairs 16
15a. Stipules usually hairy; leafy twigs ± angular; epidermis of the petiole flaking off; figs usually subsessile and the receptacle hairy. — New Guinea **2. F. edelfeltii**
b. Stipules glabrous; leafy twigs terete to ± compressed; epidermis of the petiole persistent; figs distinctly pedunculate and the receptacle glabrous. — Philippines, Moluccas, New Guinea . . . . . **13. F. polyantha**
16a. Basal lateral veins clearly different from the other lateral veins, departing at a more acute angle; figs sessile. — Celebes, Moluccas, New Guinea . . . . . **6. F. hombroniana**
b. Basal lateral veins not or hardly different from the other lateral veins; figs pedunculate. — New Guinea 17
17a. Stipules glabrous . . . . . **18. F. subnervosa**
b. Stipules hairy . . . . . **12. F. pachysycia**
18a. Tertiary venation parallel to the lateral veins (with 1–3 secondary lateral veins between the primary ones). — New Guinea (incl. Admiralty Islands) . . . . . **19. F. subtrinervia**
b. Tertiary venation of the lamina scalariform, reticulate to subscalariform (with one or few transverse veins in the intercostal area) or to partly parallel to the lateral veins 19
19a. Lateral veins 5–10 pairs 20
b. Lateral veins (6–)10–22 pairs 22
20a. Figs pedunculate, the receptacle (0.7–)1–1.5 cm diam. when dry. — Sumatra, Java, Borneo, Philippines, Lesser Sunda Islands, Moluccas . . . . . **11a. F. nervosa** subsp. **pubinervis**
b. Figs sessile, the receptacle 0.7–1 cm diam. 21
21a. Lateral veins of the lamina impressed above; fig receptacle non-stipitate. — Celebes . . . . . **10. F. matanoensis**

b. Midrib and lateral veins of the lamina (almost) flat above; fig receptacle stipitate. — New Guinea . . . . . **1. F. carinata**
22a. Lateral veins of the lamina (15–)18–22 pairs 23
b. Lateral veins of the lamina (6–)10–17 pairs 24
23a. Stipules 1–3 cm long; fig receptacle sparsely whitish puberulous. — Malay Peninsula, Sumatra, Java, Borneo, Philippines, Celebes, Lesser Sunda Islands . . . . . **9. F. magnoliifolia**
b. Stipules (1.5–)2–5.5 cm long; fig receptacle densely brown puberulous. — New Guinea . . . . . **5. F. hadroneura**
24a. Fig receptacle 0.7–1 cm diam. when dry 25
b. Fig receptacle 1–3.5 cm diam. when dry 26
25a. Stipules 0.8–1 cm long; petiole 0.4–1 cm long; lateral veins of the lamina impressed above. — Celebes . . . . . **10. F. matanoensis**
b. Stipules 2–3.5 cm long; petiole 1–1.5 cm long; lateral veins of the lamina slightly prominent to flat above. — New Guinea . . . . . **15. F. saruensis**
26a. Tertiary venation of the lamina scalariform 27
b. Tertiary venation of the lamina reticulate to subscalariform (with one or few transverse veins in the intercostal area) or to partly parallel to the lateral veins . . 28
27a. Indumentum brown(ish); petioles of about similar length on the same twig; waxy glands in the axils of the basal lateral veins. — New Guinea **14. F. pseudojaca**
b. Indumentum white; petioles usually varying in length on the same twig; waxy glands absent. — Malay Peninsula, Sumatra, Java, Lesser Sunda Islands, New Guinea . . . . . **20. F. albipila**
28a. Leafy twigs densely brown hairy; lamina ± shining above when dry 29
b. Leafy twigs sparsely and minutely whitish appressed-puberulous to glabrous; lamina dull above when dry 30
29a. Figs 0.2–0.8 cm long pedunculate. — Celebes . . . . . **4. F. gratiosa**
b. Figs sessile. — New Guinea . . . . . **15. F. saruensis**
30a. Stipules 2–7 cm long; tertiary venation of the lamina reticulate to partly parallel to the lateral veins; fig receptacle 1–1.4 cm diam. when dry. — Celebes, Moluccas, New Guinea . . . . . **6. F. hombroniana**
b. Stipules (0.5–)1–2(–3) cm long; tertiary venation of the lamina reticulate to subscalariform; fig receptacle (1–)1.5–3.5 cm diam. when dry. — New Guinea . . . . . **2. F. edelfeltii**

REGIONAL KEY: MALAY PENINSULA

1a. Lamina glabrous beneath 2
b. Lamina hairy beneath, at least sparsely so on the midrib 3
2a. Tertiary venation of the lamina scalariform . . . . . **22. F. callosa**
b. Tertiary venation of the lamina reticulate . . . . . **23. F. vasculosa**
3a. Stipules white sericeous, 0.5–1.3 cm long; fig receptacle 1–1.5 cm diam. when dry . . . . . **20. F. albipila**
b. Stipules yellow appressed-puberulous to glabrous, 1–3 cm long; fig receptacle 1.5–2.5 cm diam. when dry . . . . . **9. F. magnoliifolia**

REGIONAL KEY: SUMATRA, JAVA, AND LESSER SUNDA ISLANDS

1a. Lamina glabrous beneath 2
b. Lamina hairy beneath, at least sparsely so on the midrib 3
2a. Tertiary venation of the lamina scalariform . . . . . **22. F. callosa**
b. Tertiary venation of the lamina reticulate . . . . . **23. F. vasculosa**
3a. Stipules white sericeous, 0.5–1.3 cm long; fig pedunculate, the receptacle 1–1.5 cm diam. when dry . . . . . **20. F. albipila**
b. Stipules yellow to brownish puberulous to sericeous or glabrous, 1–4 cm long; fig sessile, or if pedunculate, then 1.5–2.5 cm diam. when dry 4
4a. Lateral veins (8–)10–15(–20) pairs; fig receptacle 1.5–2.5 cm diam. when dry . . . . . **9. F. magnoliifolia**
b. Lateral veins (5–)8–10 pairs; fig receptacle 0.7–1.5 cm diam. when dry . . . . . **11a. F. nervosa** subsp. **pubinervis**

REGIONAL KEY: BORNEO

1a. Lamina glabrous beneath 2
b. Lamina hairy beneath, at least sparsely so on the midrib 3
2a. Tertiary venation of the lamina scalariform . . . . . **22. F. callosa**
b. Tertiary venation of the lamina reticulate . . . . . **23. F. vasculosa**
3a. Lateral veins (8–)10–15(–20) pairs; fig receptacle 1.5–2.5 cm diam. when dry . . . . . **9. F. magnoliifolia**
b. Lateral veins (5–)8–10 pairs; fig receptacle 0.7–1.5 cm diam. when dry . . . . . **11a. F. nervosa** subsp. **pubinervis**

REGIONAL KEY: PHILIPPINES

1a. Lamina glabrous beneath 2
b. Lamina hairy beneath, at least sparsely so on the midrib 5
2a. Tertiary venation of the lamina scalariform 3
b. Tertiary venation of the lamina reticulate 4
3a. Lamina scabridulous beneath, greenish and shining above when dry; figs pedunculate . . . . . **22. F. callosa**
b. Lamina smooth beneath, dull and brownish above when dry; figs sessile . . . . . **3. F. gigantifolia**
4a. Waxy glands absent; stipules 0.5–1.2 cm long; fig receptacle 0.8–1.5 cm diam. when dry . . . . . **21. F. bataanensis**
b. Waxy glands in the axils of the basal lateral veins beneath; stipules 2–7 cm long; fig receptacle 1.5–3 cm diam. when dry . . . . . **13. F. polyantha**
5a. Lateral veins (8–)10–15(–20) pairs; fig receptacle 1.5–2.5 cm diam. when dry . . . . . **9. F. magnoliifolia**
b. Lateral veins (5–)8–10 pairs; fig receptacle 0.7–1.5 cm diam. when dry . . . . . **11a. F. nervosa** subsp. **pubinervis**

REGIONAL KEY: CELEBES

1a. Lamina glabrous beneath 2
b. Lamina hairy beneath, at least sparsely so on the midrib 5
2a. Tertiary venation of the lamina scalariform; lamina scabridulous beneath . . . . . **22. F. callosa**
b. Tertiary venation of the lamina reticulate or largely parallel to the lateral veins; lamina smooth beneath 3
3a. Waxy glands in the axils of the second pair of lateral veins . . . . **8. F. kjellbergii**
b. Waxy glands in the axils of the basal lateral veins 4
4a. Tertiary venation largely parallel to the lateral veins (with 1–3 secondary lateral veins between the primary ones) . . . . . **19. F. subtrinervia**
b. Tertiary venation reticulate to subscalariform or to partly parallel to the lateral veins . . . . . **6. F. hombroniana**
5a. Tertiary venation largely parallel to the lateral veins (with 1–3 secondary lateral veins between the primary ones) . . . . . **19. F. subtrinervia**
b. Tertiary venation reticulate to subscalariform or to partly parallel to the lateral veins 6
6a. Stipules and petioles up to 1 cm long . . . . . **10. F matanoensis**
b. Stipules and petioles usually longer than 1 cm 7
7a. Stipules yellowish to brownish subsericeous . **11a. F. nervosa** subsp. **pubinervis**
b. Stipules whitish appressed puberulous to glabrous . . . . . **6. F. hombroniana**

REGIONAL KEY: MOLUCCAS

1a. Lamina glabrous beneath 2
b. Lamina hairy beneath, at least sparsely so on the midrib 5
2a. Tertiary venation of the lamina scalariform 3
b. Tertiary venation of the lamina reticulate 4
3a. Petiole 3–7 cm long; lamina scabridulous beneath . . . . . **22. F. callosa**
b. Petiole 1–3 cm long; lamina smooth beneath . . . . . **13. F. polyantha**
4a. Figs (sub)sessile; basal pair of lateral veins distinct . . . . . **6. F. hombroniana**
b. Figs 0.2–1.5 cm long pedunculate; basal pair of lateral veins hardly or not distinct . . . . . **13. F. polyantha**
5a. Stipules yellowish to brownish subsericeous . **11a. F. nervosa** subsp. **pubinervis**
b. Stipules whitish appressed-puberulous to glabrous . . . . . **6. F. hombroniana**

REGIONAL KEY: NEW GUINEA

1a. Lamina glabrous beneath 2
b. Lamina hairy beneath, at least sparsely so on the midrib 13
2a. Tertiary venation largely parallel to the lateral veins (with 1–3 secondary lateral veins between the primary ones) . . . . . **19. F. subtrinervia**
b. Tertiary venation reticulate to subscalariform or to partly parallel to the lateral veins 3

3a. Stipules 0.4–1.5 cm long 4
b. Stipules (1–)1.5–7.5 cm long 9
4a. Basal lateral veins clearly different from the other lateral veins, departing at a more acute angle . . . . . **6. F. hombroniana**
b. Basal lateral veins not or hardly different from the other lateral veins 5
5a. Apex of the lamina subcaudate; lamina often ± asymmetric . **17. F. subcaudata**
b. Apex of the lamina shortly acuminate to obtuse; lamina (almost) symmetric . . 6
6a. Stipules brownish appressed-puberulous to subsericeous 7
b. Stipules glabrous 8
7a. Lateral veins (8–)10–14 pairs; lamina usually longer than 10 cm **2. F. edelfeltii**
b. Lateral veins 7–9 pairs; lamina shorter than 10 cm long . . . . **16. F. sclerosycia**
8a. Petiole (0.5–)1–2.5 cm long; stipules (0.5–)1–2.8 cm long; fig receptacle (0.7–)1–2 cm diam. when dry . . . . . **18. F. subnervosa**
b. Petiole 0.4–1(–1.3) cm long; stipules 0.5–1.2 cm long; fig receptacle 0.4–0.5 cm diam. when dry . . . . . **7. F. ihuensis**
9a. Lateral veins of the lamina (8–)10–17 pairs 10
b. Lateral veins of the lamina 7–10 pairs 11
10a. Stipules usually hairy; leafy twigs ± angular; epidermis of the petiole flaking off; figs usually subsessile and the receptacle ± densely hairy . . . . . **2. F. edelfeltii**
b. Stipules glabrous; leafy twigs terete to ± compressed; epidermis of the petiole persistent; figs distinctly pedunculate and the receptacle glabrous . . . . . **13. F. polyantha**
11a. Basal lateral veins clearly different from the other lateral veins, departing at a more acute angle; figs sessile . . . . . **6. F. hombroniana**
b. Basal lateral veins not or hardly different from the other lateral veins; figs pedunculate 12
12a. Stipules glabrous . . . . . **18. F. subnervosa**
b. Stipules hairy . . . . . **12. F. pachysycia**
13a. Tertiary venation parallel to the lateral veins (with 1–3 secondary lateral veins between the primary ones) . . . . . **19. F. subtrinervia**
b. Tertiary venation of the lamina scalariform, reticulate to subscalariform (with one or few transverse veins in the intercostal area) or to partly parallel to the lateral veins 14
14a. Stipules and petioles up to 1 cm long . . . . . **1. F. carinata**
b. Stipules and petioles usually longer than 1 cm and mostly also the petioles . 15
15a. Lateral veins 5–10 pairs 16
b. Lateral veins (6–)10–22 pairs 17
16a. Stipules yellowish to brownish subsericeous **11a. F. nervosa** subsp. **pubinervis**
b. Stipules whitish appressed-puberulous to glabrous . . . . . **6. F. hombroniana**
17a. Lateral veins of the lamina (15–)18–22 pairs . . . . . **5. F. hadroneura**
b. Lateral veins of the lamina (6–)10–17 pairs 18
18a. Fig receptacle 0.7–1 cm diam. when dry . . . . . **15. F. saruensis**
b. Fig receptacle 1–3.5 cm diam. when dry 19
19a. Tertiary venation of the lamina scalariform 20
b. Tertiary venation of the lamina reticulate to subscalariform (with one or few transverse veins in the intercostal area) or to partly parallel to the lateral veins . . 21

20a. Indumentum brown(ish); petioles of about similar length on the same twig; waxy glands in the axils of the basal lateral veins . . . . . **14. F. pseudojaca**
b. Indumentum white; petioles usually varying in length on the same twig; waxy glands absent . . . . . **20. F. albipila**
21a. Leafy twigs densely brown hairy; lamina ± shining above when dry . . . . . **16. F. saruensis**
b. Leafy twigs sparsely and minutely whitish appressed-puberulous to glabrous; lamina dull above when dry 22
22a. Stipules 2–7 cm long; tertiary venation of the lamina reticulate to partly parallel to the lateral veins; fig receptacle 1–1.4 cm diam. when dry **6. F. hombroniana**
b. Stipules (0.5–)1–2(–3) cm long; tertiary venation of the lamina reticulate to subscalariform; fig receptacle (1–)1.5–3.5 cm diam. when dry . **2. F. edelfeltii**

Section Oreosycea subsection Glandulosae

Ficus L. subg. *Pharmacosycea* (Miq.) Miq. sect. *Oreosycea* (Miq.) Miq. subsect. *Glandulosae* C.C. Berg, Blumea 48 (2003) 290.
Ficus L. subg. *Pharmacosycea* (Miq.) Miq. sect. *Oreosycea* (Miq.) Miq. ser. *Nervosae* Corner, Gard. Bull. Singapore 17 (1960) 407; Philos. Trans., Ser. B, 259 (1970) 387.
Ficus L. subg. *Pharmacosycea* (Miq.) Miq. sect. *Oreosycea* (Miq.) Miq. ser. *Austrocaledonicae* Corner, Gard. Bull. Singapore 17 (1960) 407; Philos. Trans., Ser. B, 259 (1970) 402.

Indumentum often brownish. *Leaves* spirally arranged to subdistichous; lamina usually drying brownish; margin also when juvenile entire, cystoliths only beneath; waxy glandular spots in the axils of the basal (or second pair of) lateral veins; petioles about equal in length on the same twig; stipules often long. *Fig receptacle* often stipitate, without internal hairs. *Staminate flowers* ostiolar or disperse.

Distribution & Ecology — C. 45 species in the Malesian region and the Pacific, eastwards to New Caledonia, with centres in eastern Malesia and in New Caledonia; *F. nervosa* extending from Malesia through Taiwan and the Sino-Himalayan region to Sri Lanka. Its members are mostly elements of lowland wet forest. Rheophytism is found in *F. subtrinervia*.

Morphology — The trees often show more or less clearly *Terminalia*-branching (see p. 22). The leafy twigs are often hollow. The leaves are spirally arranged, but are in some species subdistichous or even distichous (as in *F. polyantha*). The basal lateral veins vary from being hardly or not different from the other lateral veins to clearly distinct in being longer and departing at more acute angles from the midrib, thus with a venation tending to trinervate. The difference in shape of the lamina of subjuvenile trees and that of adult ones, lanceolate versus oblong to elliptic, may occur not only in *F. subtrinervia*. This subsection shows in its overall differentiation of the vegetative parts similarities to sect. *Adenosperma* (subg. *Sycomorus*).

Subdivision — Two groups of species can be distinguished:

a. *Ficus austrocaledonica*-group (series *Austrocaledonicae* Corner) — 25–30 species, the majority endemics of New Caledonia (see Corner 1970). However, in contrast to Corner's opinion (1960, 1967, 1970) the group is also represented in the New Hebrides, Fiji, and the Solomon Islands, with in total four species (Berg 2002). This group differs from the *F. nervosa*-group, e.g., in the absence of long

stipules, the pale colour of dried and predominantly chartaceous laminas, and in being (sub)pachycladous (pachycaul sensu Corner).

b. *Ficus nervosa*-group (series *Nervosae* Corner) — Ranging from Sri Lanka to Taiwan and to the Solomon Islands with 19 species. The leaves are often subdistichous, the lamina is often slightly asymmetric, at least at the base, it is coriaceous and usually brown when dry, the stipules are long in several species. Many species become tall forest trees, up to 50 m, often with buttresses. But this group also comprises species of small trees or species which start to reproduce as small trees or shrubs (e.g., *F. subtrinervia*). The tertiary venation varies from scalariform to reticulate to partly parallel to the lateral veins, sometimes with tertiary veins which can become nearly as strong as the (primary) lateral veins (in *F. subtrinervia*). Hairs on pedicels, in flowers, and at the apices of tepals are not common; hairy pedicels are found in *F. pseudojaca* (New Guinea) and *F. setulosa* (Solomon Islands). *Ficus nervosa* extends to the Asian mainland. *Ficus gigantifolia* (endemic to the Philippines), *F. magnoliifolia*, and *F. nervosa* subsp. *pubinervis* are western Malesian. The majority of the species are eastern Malesian; three of them extend to the Solomon Islands, where *F. setulosa* is endemic (Berg 2002).

References: Berg, C.C., Ficus subgenus Pharmacosycea section Oreosycea (Moraceae) in the Solomon Islands, Fiji, and the New Hebrides. Blumea 47 (2002) 299–314. — Corner, E.J.H., Taxonomic notes on Ficus Linn., Asia and Australasia. II. Subgen. Pharmacosycea Miq. Gard. Bull. Singapore 17 (1960) 405–415. — Corner, E.J.H., Ficus in the Solomon Islands and its bearing on the Post-Jurassic history of Melanesia. Philos. Trans., Ser. B, 253 (1967) 23–159. — Corner, E.J.H., Ficus subg. Pharmacosycea with reference to the species of New Caledonia. Philos. Trans., Ser. B, 259 (1970) 383–433.

1. **Ficus carinata** C.C. Berg

Ficus carinata C.C. Berg, Blumea 48 (2003) 291.

Tree. *Branchlets* drying (dark) brown to blackish. *Leafy twigs* 1.5–3 mm thick, solid, ± angular, brownish puberulous. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)obovate, 4.5–11 by 2.5–5.5 cm, symmetric, coriaceous, apex (shortly and bluntly) acuminate, base obtuse to rounded, margin entire, ± revolute; upper surface glabrous, dull when dry, lower surface (minutely) brownish puberulous, mainly on the midrib and lateral veins, smooth; midrib almost flat above, lateral veins (6–)8–12 pairs, the basal pair slightly distinct, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins; petiole 0.4–0.8 cm long, brownish puberulous, the epidermis flaking off; stipules c. 1 cm long, keel prominent, appressed puberulous on the keel and ciliolate, caducous. *Figs* axillary, in pairs, sessile; basal bracts 3, verticillate, 1–1.5 mm long, persistent; receptacle subglobose, 0.7–1 cm diam. when dry, 0.2–0.5 cm long stipitate, sparsely glabrous, red-brown (?) at maturity, apex convex, ostiole c. 1 mm diam., slightly prominent; internal hairs absent. *Tepals* (dark) red, glabrous. *Stamen* 1.

Distribution — Moluccas (Aru Islands).

Habitat — Forest, at low altitudes.

Note — This species resembles *F. hombroniana*, from which it differs in the indumentum on the lamina beneath and in the short and carinate stipules.

2. **Ficus edelfeltii** King

Ficus edelfeltii King, J. Asiat. Soc. Bengal. Pt. 2, Nat. Hist. (1887) 402; Sp. Ficus 2 (1888) App. 4, t. 227, non Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 80, quae est *F. magnoliifolia* Blume; Sp. Ficus 2 (1889) App. 6, t. 229; Diels, Bot. Jahrb. Syst. 67 (1935) 185; Corner, Gard. Bull. Singapore 21 (1965) 30; Philos. Trans., Ser. B, 253 (1967) 74, t. 13, 75, t. 14.
Ficus edelfeltii King var. *glyptoneura* Diels, Bot. Jahrb. Syst. 67 (1935) 185.
Ficus mesotes Corner, Philos. Trans., Ser. B, 259 (1970) 430, t. 31.
Ficus homodroma Corner, Philos. Trans., Ser. B, 259 (1970) 432, t. 32.

Tree up to 25 m tall, without or with buttresses up to 1 m high. *Branchlets* drying brown; scars of the petioles ± prominent. *Leafy twigs* 2–4 mm thick, solid, ± angular, rather densely to sparsely minutely white puberulous to glabrous. *Leaves* spirally arranged to subdistichous; lamina oblong to elliptic, 8–20(–33) by 3.5–9(–14) cm, often slightly asymmetric, coriaceous, apex (shortly and bluntly) acuminate, base often slightly inequilateral, cuneate to rounded (to subattenuate or to subcordate), margin entire, flat or slightly revolute; upper surface glabrous, dull when dry, lower surface (very) (sparsely) appressed-puberulous to strigillose on the midrib or (sub)glabrous, smooth; cystoliths only beneath; midrib almost flat above, lateral veins (8–)10–14 pairs, sometimes furcate far from the margin, the basal pair slightly or not distinct, tertiary venation reticulate to subscalariform, the smaller veins slightly prominent to almost flat beneath; waxy glands in the axils of the basal lateral veins; petiole 1–2.5(–5) cm long, appressed-puberulous or glabrous, the epidermis flaking off; stipules 1–2(–3) cm long, densely brownish to whitish appressed-puberulous to subsericeous (or subglabrous), caducous (or subpersistent). *Figs* axillary, in pairs or solitary, (sub)sessile or up to 0.3 cm long pedunculate; basal bracts (2 or) 3, (sub)verticillate, 2–3 mm long, persistent, densely appressed-puberulous; receptacle subglobose, (1–)1.5–3.5 cm diam. when dry, rather densely (to sparsely) brownish appressed-puberulous to subtomentose, sometimes with some lateral bracts, red at maturity, apex convex, ostiole 1.5–5 mm diam., prominent, often surrounded by apical bracts; internal hairs present (sparse and short) or absent. *Tepals* red, glabrous. *Stamens* 1 or 2. — **Fig. 33.**

Distribution — New Guinea.

Habitat — Forest and montane scrub, at altitudes up to 1650 m.

Uses — The bark is used to make rope for clothes.

Notes — 1. The material from the Solomon Islands that has been referred to in this species (Corner 1960, 1967) is currently included in the variable *F. novae-georgiae* Corner (Berg, Blumea 47 (2002) 308).

2. In the material from eastern New Guinea, the lamina is cuneate to obtuse at the base and the apex short-acuminate to obtuse. In western New Guinea, the base of the lamina varies from cuneate to subcordate and the apex is more long-acuminate, moreover, the stipules may be subglabrous.

3. **Ficus gigantifolia** Merr.

Ficus gigantifolia Merr., Publ. Gov. Lab. Philipp. 29 (1905) 9; Elmer, Leafl. Philipp. Bot. 1 (1907) 259; 7 (1914) 2407; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 52; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 211; Corner, Gard. Bull. Singapore 21 (1965) 31.

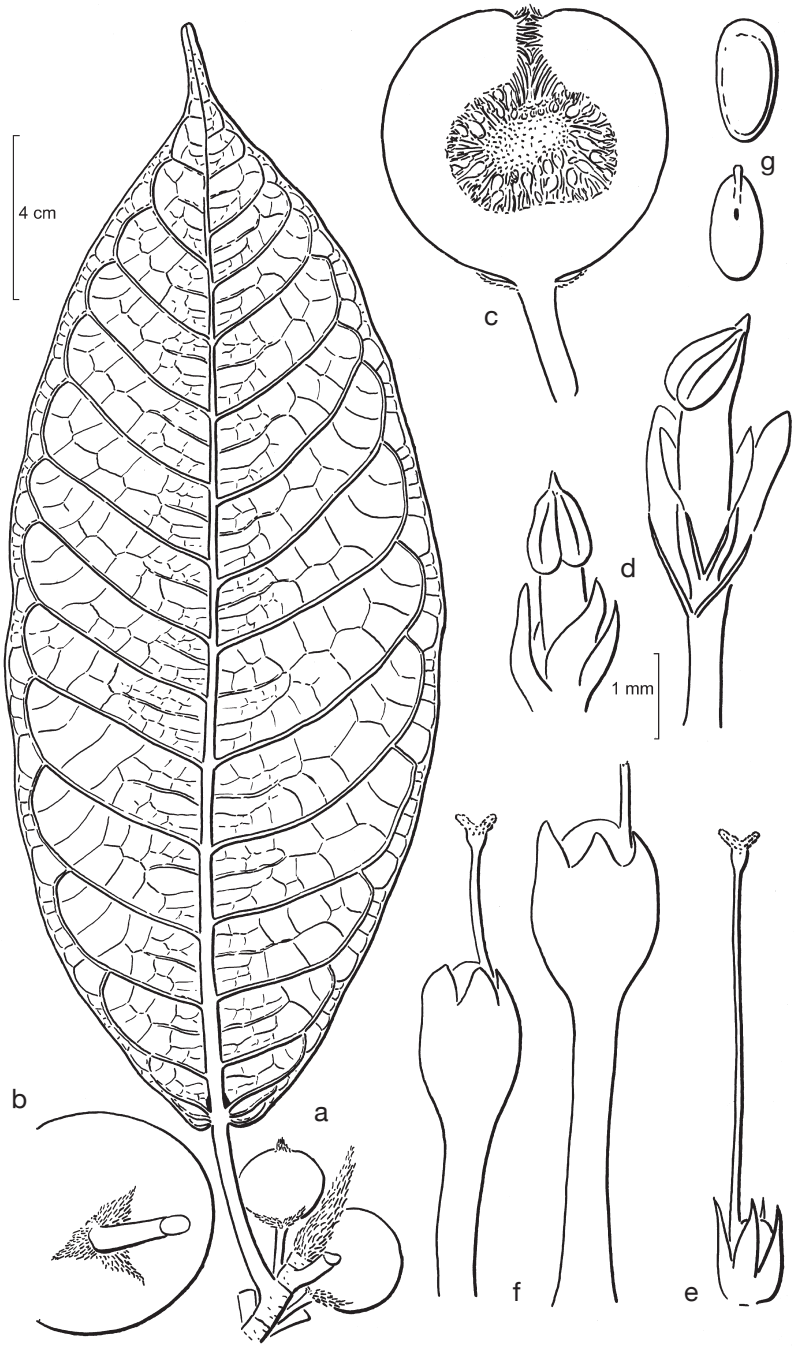


Fig. 33. *Ficus edelfeltii* King. a. Leafy twigs with figs; b. basal bracts; c. fig; d. staminate flowers; e. long-styled flower; f. short-styled flowers; g. fruits (all: *RSS 2*). From Philos. Trans., Ser. B, 253 (1967) 74.

Tree up to 18 m tall. *Branchlets* drying brown to blackish. *Leafy twigs* 6–12 mm thick, solid, ± angular, glabrous. *Leaves* spirally arranged; lamina ovate to elliptic, 20–40 by 15–28 cm, symmetric, coriaceous, apex obtuse, base rounded to cordate, margin entire, flat; upper surface glabrous, dull when dry, lower surface glabrous, smooth; cystoliths only beneath; midrib slightly impressed to almost flat above, lateral veins 10–15 pairs, the basal pair not distinct, tertiary venation loosely scalariform, the smaller veins slightly prominent to almost flat beneath; waxy glands in the axils of the basal lateral veins; petiole 3–8 cm long, glabrous, the epidermis persistent; stipules 4–10 cm long, glabrous, caducous. *Figs* axillary, in pairs, sessile; basal bracts 3, verticillate, 5–10 mm long, persistent; receptacle subglobose, 1.5–2.5 cm diam. when dry, 2–3 cm diam. when fresh, non-stipitate, glabrous, green (?) at maturity, apex convex, ostiole 2–3 mm diam., ± prominent; internal hairs absent. *Tepals* red, glabrous. *Stamens* (1 or) 2.

Distribution — Philippines (Bohol, Luzon, Mindanao, Samar).

Habitat — Forest, at altitudes up to 1200 m.

4. **Ficus gratiosa** Corner

Ficus gratiosa Corner, Gard. Bull. Singapore 17 (1960) 408; 21 (1965) 30.
Ficus gratiosa Corner var. *caudata* Corner, Gard. Bull. Singapore 17 (1960) 409.

Tree up to 10 m tall. *Branchlets* drying brown. *Leafy twigs* 3–4 mm thick, solid, ± angular, brown velutinous. *Leaves* spirally arranged; lamina lanceolate, 12–24 by 3.5–9 cm, symmetric, coriaceous, apex acuminate to subcaudate, base cuneate to rounded, margin entire, flat to revolute towards the base; upper surface glabrous, ± shining when dry, lower surface densely to sparsely brown(ish) subsericeous to subvillous to subtomentose on the veins, smooth; cystoliths only beneath; midrib impressed to flat above, lateral veins 10–13(–15) pairs, the basal pairs ± distinct, unbranched, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins slightly prominent beneath; waxy glands in the axils of the basal lateral veins; petiole 1–3.5 cm long, brown (sub)velutinous, the epidermis flaking off (not soon); stipules 1–2.5 cm long, brown sericeous, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.2–1 cm long; basal bracts 3, verticillate or scattered on the peduncle, 1.5–3 mm long, caducous (or subpersistent?); receptacle subglobose, 1.3–2 cm diam. when dry, 0–0.2 cm long stipitate, brownish subtomentose, colour at maturity unknown, apex convex, ostiole c. 2 mm diam., slightly prominent; internal hairs present, rather sparse, or absent. *Tepals* red, glabrous. *Stamens* 1 (or 2).

Distribution — Celebes (Minahassa; Todjamboe).

Habitat — Forest, at altitudes between 800 and 1400 m.

Notes — 1. This species has been placed in series *Vasculosae* by Corner (1960), but the dense indumentum on the leafy twigs and the petioles suggests that it is related to *F. pseudojaca*. It shows also similarities to *F. edelfeltii*.

2. Internal hairs are found in the type of var. *caudata*.

5. **Ficus hadroneura** Diels

Ficus hadroneura Diels, Bot. Jahrb. Syst. 67 (1935) 186; Corner, Gard. Bull. Singapore 17 (1960) 413; 21 (1965) 32; Philos. Trans., Ser. B, 259 (1970) 389.

Tree up to 40 m tall, with buttresses up to 3 m. *Branchlets* drying (dark) brown. *Leafy twigs* 2–5 mm thick, solid or hollow, ± angular, densely minutely brownish puberulous to tomentellous. *Leaves* spirally arranged to subdistichous; lamina oblong to elliptic to (sub)ovate, 15–33 by 8–17 cm, ± asymmetric (to symmetric), coriaceous, apex acuminate to obtuse, base inequilateral (to equilateral), narrowly rounded (to truncate) to cuneate to subattenuate, margin entire, flat; upper surface glabrous, dull when dry, lower surface brownish (sparsely) appressed-puberulous on the midrib or also on the lateral veins, smooth; cystoliths only beneath; midrib slightly impressed to flat above, lateral veins (15–)18–22 pairs, the basal pair hardly or not distinct, tertiary venation scalariform, the smaller veins slightly prominent beneath; waxy glands in the axils of the basal lateral veins; petiole 0.5–1.5(–2) cm long, minutely puberulous, the epidermis flaking off (sooner or later); stipules (1.5–)2–7 cm long, densely brown(ish) appressed-puberulous, caducous. *Figs* axillary, in pairs, subsessile or up to 1.2 cm long pedunculate (?); basal bracts 3, scattered on the peduncle (?), c. 2 mm long, persistent; receptacle subglobose to ovoid, 1–1.5 cm diam. when dry, non-stipitate (or stipitate?), densely brown puberulous, at maturity greenish (?), apex convex, ostiole 2–3 mm diam., prominent to flat; wall thick; internal hairs abundant. *Pedicels* hairy. *Tepals* pinkish, glabrous. *Stamen* 1 (?).

Distribution — New Guinea incl. New Britain.

Habitat — Forest, at low altitudes.

Note — This species is distinct by the numerous lateral veins.

6. **Ficus hombroniana** Corner

Ficus hombroniana Corner, Gard. Bull. Singapore 17 (1960) 410; 21 (1965) 30; Philos. Trans., Ser. B, 253 (1967) 73, t. 12.

Ficus madhucifolia Corner, Gard. Bull. Singapore 17 (1960) 412; 21 (1965) 32.

Tree up to 32 m tall, with buttresses up to 1 m high. *Branchlets* drying dark brown to blackish. *Leafy twigs* 2–5 mm thick, solid, terete, minutely white appressed-puberulous to glabrous. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)obovate (to oblanceolate), 6–20 by 3–8.5 cm, symmetric, coriaceous, apex shortly and bluntly (sub)acuminate to obtuse (to subacute), base cuneate to truncate, margin entire, flat; upper surface glabrous, ± shining to dull when dry, lower surface (very) sparsely appressed-puberulous on the midrib to glabrous, smooth; cystoliths only beneath; midrib almost flat above, lateral veins 7–10 or 10–14 pairs, the basal pair distinct, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins almost flat beneath; waxy glands in the axils of the basal lateral veins; petiole (0.7–)1–2.5 cm long, appressed-puberulous to glabrous, the epidermis flaking off; stipules (1.3–)2–7.5 cm long, densely white appressed-puberulous to glabrous, caducous. *Figs* axillary, in pairs, (sub)sessile; basal bracts 3, verticillate, 1–2 mm long, persistent, densely appressed-puberulous; receptacle subglobose, 0.6–1.4 cm diam. when dry, 0.2–1.2 cm long stipitate,

sparsely white puberulous to glabrous, reddish at maturity, apex convex, ostiole c. 2 mm diam., ± prominent; internal hairs absent. *Tepals* red, glabrous. *Stamen* 1.

Distribution — Malesia to the Solomon Islands; in *Malesia*: Celebes (southern), Moluccas (Ambon, Buru, Ceram), New Guinea.

Habitat — Forest, at low altitudes.

Uses — Bark is used to make cloth (Moluccas).

Notes — 1. The present description also comprises the type of *F. madhucifolia* from Celebes, which differs from the other collections in the relatively narrow lamina with a subacute apex, a smaller number of lateral veins (7–10) pairs, the smaller veins rather obscure beneath, the relatively short stipules (2–3 cm long), and the smaller fig receptacle (0.8–1 cm diam. when dry). The shape of the lamina might be related to a subjuvenile state (see note 3).

2. Two collections from New Guinea, from Numfoor Island (*Ch. Koster BW 1049*) and Yapen Island (*Aet & Idjin 721*) also differ from the majority of the collections in the smaller number of lateral veins (7–9 pairs), relatively short stipules (1.3–2.5 cm long), and smaller figs (0.6–0.7 cm diam. when dry).

3. A collection from Buru, made from a small tree, has oblanceolate laminas, more or less clearly acuminate. It may represent a (sub)juvenile state.

7. Ficus ihuensis Summerh.

Ficus ihuensis Summerh., J. Arnold Arbor. 10 (1929) 153; 22 (1941) 107; Diels, Bot. Jahrb. Syst. 67 (1936) 187; Corner, Gard. Bull. Singapore 21 (1965) 30; Philos. Trans., Ser. B, 259 (1970) 430, t. 30.

Tree up to c. 40 m tall. *Branchlets* drying (dark) brown. *Leafy twigs* 1–2 mm thick, solid, ± angular to compressed, glabrous. *Leaves* in lax spirals to subdistichous; lamina oblong to elliptic to subobovate, 3–12 by 1–4 cm, symmetric, coriaceous, apex (sub)acuminate to obtuse, base cuneate to obtuse, margin entire, (almost) flat to ± revolute; upper surface glabrous, slightly shining when dry, lower surface glabrous, smooth; midrib almost flat above, lateral veins 7–10 pairs, the basal pair slightly or not distinct, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins flat beneath; waxy glands in the axils of the basal lateral veins; petiole 0.4–1(–1.3) cm long, glabrous, the epidermis flaking off; stipules 0.5–1.2 cm long, glabrous, caducous. *Figs* axillary, in pairs; peduncle 0.2–0.7 cm long; basal bracts 1–3, scattered, one at the base of the peduncle, the other(s) upward or subtending the receptacle, c. 0.5 cm long, persistent; receptacle ellipsoid to subglobose, 0.4–0.5 cm diam. when dry, glabrous, red at maturity, apex convex to slightly umbonate, ostiole 1–1.5 mm diam., slightly prominent to flat; internal hairs absent. *Tepals* (dark) red, glabrous. *Stamens* 2. — **Fig. 34.**

Distribution — New Guinea (eastern).

Habitat — Forest, at altitudes of c. 1500 m.

Note — This species resembles *F. subnervosa* and *F. subtrinervia*. It differs from the former in the small figs and from the latter in the short (and glabrous) stipules and the pedunculate figs.

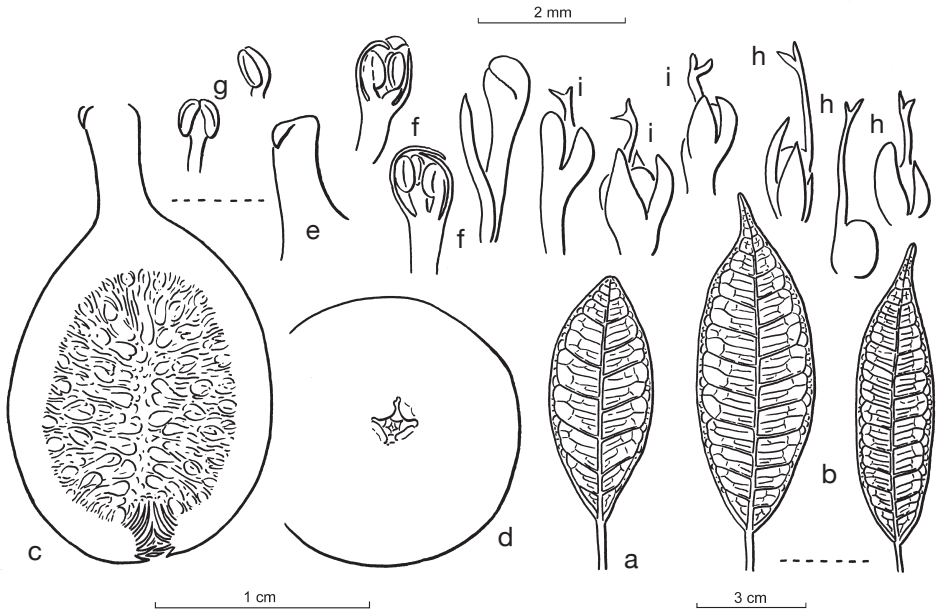


Fig. 34. *Ficus ihuensis* Summerh. a, b. Leaves; c. fig; d. ostiole; e. peduncle and bract; f. staminate flowers; g. stamens; h. long-styled flowers; i. short-styled flowers (a: *Carr 15426*; b–h: *Carr 14528*). From Philos. Trans., Ser. B, 259 (1970) 431.

8. **Ficus kjellbergii** Corner

Ficus kjellbergii Corner, Gard. Bull. Singapore 17 (1960) 411; 21 (1965) 30.

Treelet up to 5 m tall. *Branchlets* drying brown to blackish. *Leafy twigs* 1–2 mm thick, solid, terete, glabrous. *Leaves* spirally arranged; lamina elliptic to (sub)obovate, 4–7.5 by 1.8–3.8 cm, symmetric, coriaceous, apex shortly and bluntly (sub)acuminate to obtuse, base cuneate, margin entire, (almost) flat; upper surface glabrous, dull when dry, lower surface glabrous, smooth; cystoliths only beneath; midrib almost flat above, lateral veins 7–9 pairs, the basal pair distinct, short, tertiary venation reticulate, the smaller veins (almost) flat beneath; waxy glands in the axils of the lateral veins above the basal ones; petiole 0.6–1.8 cm long, the epidermis flaking off; stipules 0.7–1.2 cm long, glabrous, caducous. *Figs* axillary, in pairs or solitary, (sub)sessile; basal bracts 3, verticillate, c. 1 mm long, persistent, glabrous; receptacle subglobose, 0.5–0.8 cm diam. when dry, 0.6–0.9 cm long stipitate, glabrous, red at maturity, apex convex, ostiole 1–1.5 mm diam., almost flat; internal hairs absent. *Tepals* red, glabrous. *Stamen* 1.

Distribution — Celebes (Tolala).

Habitat — Forest on calcareous substrate, at low altitudes.

Note — This small-leaved species (only known from the type collection) can be easily recognized by the position of the waxy glands: in the axils of the second pair or lateral veins.

9. **Ficus magnoliifolia** Blume

Ficus magnoliifolia Blume, Bijdr. (1825) 448; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 263, 286, '*magnoliaefolia*'; Corner, Gard. Bull. Singapore 21 (1965) 31; Backer, Blumea 6 (1948) 305, 306; Backer & Bakh.f., Fl. Java 2 (1965) 27, '*magnoliaefolia*'; Kochummen, Tree Fl. Malaya 3 (1978) 151, t. 7; Tree Fl. Sabah & Sarawak 3 (2000) 286.
Urostigma modestum Miq. var. *longifolium* Miq., Pl. Jungh. (1851) 51.
Urostigma euneuron Miq., Fl. Ind. Bat. 1, 2 (1859) 353.
Ficus nervosa Elmer forma *lanceolata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 185.
Ficus edelfeltii auct. non King: Koord., Minah. (1898) 599; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 80; Koord., Atlas Baumart. Java 4 (1916) t. 713.
Ficus nervosa auct. non B. Heyne ex Roth: Elmer, Leafl. Philipp. Bot. 2 (1908) 537; 9 (1937) 3475; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 58; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 184. — *Ficus apoensis* Elmer, Leafl. Philipp. Bot. 4 (1911) 1249; 7 (1914) 2414. — *Ficus nervosa* Elmer forma *apoensis* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 186.

Tree up to 45 m tall, with buttresses up to 2 m high. *Branchlets* drying dark brown to blackish. *Leafy twigs* 2–3 mm thick, solid or hollow, subterete and ribbed, minutely whitish puberulous. *Leaves* spirally arranged; lamina oblong to lanceolate, (7–)10–20(–30) by (2.5–)5–8(–11) cm, symmetric, coriaceous, apex acuminate, base cuneate to rounded, margin entire, flat; upper surface glabrous, dull when dry, lower surface sparsely appressed-puberulous to subsericeous on the midrib (and lateral veins), smooth; cystoliths only beneath; midrib ± impressed above, lateral veins (8–)10–15(–20) pairs, often slightly impressed, the basal pair hardly or not distinct, tertiary venation loosely scalariform to reticulate, the smaller veins slightly prominent beneath; waxy glands in the axils of the basal lateral veins; petiole (0.5–)1–2(–3.5) cm long, appressed-puberulous, the epidermis flaking off; stipules 1–3 cm long, densely yellowish appressed-puberulous to glabrous, caducous. *Figs* axillary, in pairs or solitary, sessile or up to 0.6 cm long pedunculate; basal bracts (2 or) 3, verticillate, 1–2 mm long, persistent or caducous; receptacle subglobose, 1–2 cm diam. when dry, 1.5–2.5 cm diam. when fresh, 0.5–1.3 cm long stipitate or non-stipitate, very whitish puberulous, colour at maturity unknown, apex convex, ostiole 1.5–2 mm diam., slightly prominent; internal hairs absent. *Tepals* red, glabrous. *Stamen* 1.

Distribution — Outside Malesia: Nicobar and Andaman Islands; in *Malesia*: Malay Peninsula, Sumatra, Java, Lesser Sunda Islands (Sumbawa, Flores), Borneo (northern), Philippines (Luzon, Leyte, Mindanao), Celebes.

Habitat — Forest, at altitudes up to 1800 m.

Note — The latex is poisonous.

10. **Ficus matanoensis** C.C. Berg

Ficus matanoensis C.C. Berg, Blumea 48 (2003) 293.

Tree up to 20 m tall. *Branchlets* drying (dark) brown. *Leafy twigs* 1.5–3 mm thick, solid, ± angular, brown appressed-puberulous to subtomentose. *Leaves* spirally arranged; lamina oblong to elliptic or to lanceolate, (3–)5–18 by (1–)2.5–5.5 cm, symmetric, coriaceous, apex (sub)acuminate to rounded, base obtuse to subattenuate, margin entire, ± revolute to flat; upper surface sparsely appressed-puberulous to subtomentose,

mainly on the midrib, glabrescent, ± shining when dry, lower surface brown appressed-puberulous to subsericeous to subtomentose, mainly on the main veins, smooth; midrib almost flat to slightly impressed above, lateral veins 5–15 pairs, ± impressed above, loop-connected far from the margin, the basal pair ± distinct, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins; petiole (0.1–)0.4–1 cm long, brown appressed-puberulous to subtomentose, the epidermis flaking off; stipules 0.8–1 cm long, brown appressed-puberulous to subsericeous, caducous. *Figs* axillary, in pairs or solitary, sessile; basal bracts 3, verticillate, 1–1.5 cm long; receptacle subglobose, 0.7–1 cm diam. when dry, substipitate, (sparsely) brownish puberulous to subtomentose, red at maturity, apex convex, ostiole 1–1.5 mm diam., slightly sunken to flat and surrounded by a low rim or slightly prominent; internal hairs absent. *Tepals* (dark) red, glabrous. *Stamen* 1.

Distribution — Celebes.

Habitat — Forest, at low altitudes.

Note — The collection made from a shrub (*De Vogel 6229*) has lanceolate laminas, whereas the other made from a tree has oblong to elliptic ones. This suggests that the lanceolate lamina is (sub)juvenile trait (like in *F. subtrinervia*).

11. **Ficus nervosa** B. Heyne ex Roth

Ficus nervosa B. Heyne ex Roth in Roem. & Schult., Syst. Veg. 1 (1817) 513; Roth, Nov. Pl. Sp. (1821) 388; Corner, Gard. Bull. Singapore 21 (1965) 31; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 146, t. 20; C.C. Berg, Blumea 48 (2003) 298.

Three allopatric subspecies can be recognized and distinguished on the basis of quantitative differences: subsp. *nervosa* (ranging from India through Myanmar, Indochina, S China to Taiwan), subsp. *minor* (King) C.C. Berg (confined to Sri Lanka and India), and the Malesian subsp. *pubinervis*.

a. subsp. **pubinervis** (Blume) C.C. Berg

Ficus nervosa B. Heyne ex Roth subsp. *pubinervis* (Blume) C.C. Berg, Blumea 48 (2003) 298. — *Ficus pubinervis* Blume, Bijdr. (1825) 452; Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 496; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 263, 286; King, Sp. Ficus 1 (1887) 56, t. 66, 84; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 77; Renner, Bot. Jahrb. Syst. 39 (1907) 382; Koord., Atlas Baumart. Java 4 (1916) t. 712; Merr., Enum. Born. (1921) 326; Enum. Philipp. Flow. Pl. 2 (1923) 62; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 186; Backer & Bakh.f., Fl. Java 2 (1965) 187; Corner, Gard. Bull. Singapore 21 (1965) 31; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 297.

Ficus decaisnei Steud., Nomencl. Bot. ed. 2, 1 (1840) 636.

Urostigma hasseltii Miq., Pl. Jungh. (1851) 46; Fl. Ind. Bat. 1, 2 (1859) 341; Fl. Ind. Bat., Suppl. (1861) 437.

Ficus pubinervis Blume var. *teysmannii* King, Sp. Ficus 1 (1887) 54.

Ficus similis Merr., Philipp. J. Sci., 1, Suppl. (1906) 47; Elmer, Leafl. Philipp. Bot. 1 (1907) 243; 2 (1908) 548; 4 (1912) 1397; 9 (1937) 3470.

Ficus crassitora Elmer, Leafl. Philipp. Bot. 2 (1908) 548. — *Ficus pubinervis* forma *crassitora* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 187.

Ficus sibulanensis Elmer, Leafl. Philipp. Bot. 4 (1911) 1266; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 65. — *Ficus pubinervis* Blume forma *sibulanensis* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 187. — *Ficus pubinervis* Blume var. *sibulanensis* (Elmer) Corner, Gard. Bull. Singapore 17 (1960) 411.

Ficus pubinervis Blume var. *diandra* Corner, Gard. Bull. Singapore 17 (1960) 410.

Tree up to 40 m tall, with buttresses up to 2.5 m high or with small stilt-roots. *Branchlets* drying brown to greyish. *Leafy twigs* 2–6 mm thick, solid (or hollow), slightly angular to ± compressed to subterete, yellowish to brownish appressed-puberulous. *Leaves* spirally arranged (to subdistichous); lamina oblong to subobovate, 4–19 by 1.5–8.5 cm, symmetric, coriaceous, apex acuminate to subacute, base cuneate to subattenuate, margin entire, flat; upper surface glabrous, dull when dry, lower surface whitish to yellowish appressed-puberulous to subsericeous on the midrib, smooth; cystoliths only beneath; midrib almost flat above, lateral veins (5–)8–10 pairs, the basal pair ± distinct, tertiary venation reticulate, the smaller veins slightly prominent beneath; waxy glands in the axils of the (main) basal lateral veins; petiole (0.5–)1–2 cm long, appressed-puberulous, the epidermis persistent or flaking off; stipules (1–)2–4 cm long, yellowish to brownish subsericeous, caducous. *Figs* axillary, solitary (or in pairs), (sub)sessile; basal bracts 3, verticillate, 1–2 mm long, persistent; receptacle subglobose, (0.6–)1–1.5(–2?) cm diam. when dry, 1.5–3 cm diam. when fresh, 0–1 cm long stipitate, whitish appressed-puberulous, at maturity yellow to red, sometimes with a lateral bract, apex convex, ostiole c. 2 mm diam., slightly prominent; wall thick; internal hairs absent. *Tepals* red, glabrous. *Stamens* 1 (or 2).

Distribution — From Taiwan to Malesia; in *Malesia*: Sumatra, Java, Lesser Sunda Islands (Sumbawa, Flores, Timor, Wetar), Borneo, Philippines, Celebes, Moluccas (Buru, Halmahera, Sula, Aru Islands).

Habitat — Forest; at altitudes up to 1650 m.

Notes — 1. The differences between the subspecies are mainly quantitative, like shorter stipules and smaller figs in subsp. *nervosa* and smaller leaves in subsp. *minor*. However, the pollinators of subsp. *nervosa* and subsp. *pubinervis* are different species of *Dolichoris*. On the other hand, those of subsp. *nervosa* and of *F. magnoliifolia* are distinct only at the subspecies level (Wiebes, Verh. Kon. Ned. Akad. Wet., afd. Natk., 2de reeks 92 (1994) 199).

2. This species is also quite similar to *F. subnervosa*, which is distinct by the absence of indumentum on all parts.

12. **Ficus pachysycia** Corner

Ficus pachysycia Diels ex Corner, Gard. Bull. Singapore 17 (1960) 409; 21 (1965) 30; Philos. Trans., Ser. B, 259 (1970) 429, t. 29.

Tree, large. *Branchlets* drying (dark) brown. *Leafy twigs* 5–9 mm thick, solid, ± angular, sparsely appressed-puberulous. *Leaves* in (lax) spirals; lamina elliptic to oblong, 13–20 by 8–12 cm, almost symmetric at the base, coriaceous, apex short-acuminate to obtuse, base slightly inequilateral, narrowly subcuneate to subtruncate, margin entire, flat to slightly revolute; upper surface glabrous, dull when dry, lower surface brownish (sparsely) appressed-puberulous on the midrib, smooth; cystoliths only beneath; midrib

flat and lateral and smaller veins slightly prominent and conspicuous above, lateral veins 8–10 pairs, the basal pair hardly or not distinct, tertiary venation reticulate (to subscalariform), the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins; petiole 1.5–2.5 cm long, sparsely appressed-puberulous, the epidermis flaking off; stipules 1.5–2 cm long, densely brown(ish) appressed-puberulous, caducous. *Figs* axillary, solitary (?); peduncle c. 1.2 cm long; basal bracts 2, scattered on the peduncle, c. 1.5 mm long, persistent; receptacle subglobose (or ellipsoid?), 2.5–3 cm diam. when dry, non-stipitate, (sub)glabrous, greenish (?) at maturity, apex convex, ostiole 2–3 mm diam., slightly prominent; wall very thick (0.9–1.3 cm when dry); internal hairs absent. *Tepals* red, glabrous. *Stamens* 2 (or 3).

Distribution — New Guinea (Morobe Province).

Habitat — Forest, at c. 1500 m altitude.

Note — This species is only known by the type collection and it is distinct by the large and very thick-walled receptacle.

13. **Ficus polyantha** Warb.

Ficus polyantha Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 250; Diels, Bot. Jahrb. Syst. 67 (1935) 193 (sub *F. subulata* Blume); Corner, Gard. Bull. Singapore 21 (1965) 30; Philos. Trans., Ser. B, 253 (1967) 81, t. 18.

Ficus frondosa S. Moore, J. Bot. 61, Suppl. (1923) 50; Diels, Bot. Jahrb. Syst. 67 (1935) 186.

Tree up to c. 50 m tall, with buttresses up to 3.5 m high. *Branchlets* drying brown to blackish. *Leafy twigs* 2–6 mm thick, solid (or hollow), terete or slightly compressed, glabrous (or yellowish puberulous). *Leaves* (sub)distichous; lamina oblong to subovate, (5–)10–30 by (2–)6–12 cm, symmetric, coriaceous, apex subacuminate to subacute, base rounded to subcordate (or to cuneate), margin entire, flat; upper surface glabrous, dull when dry, lower surface glabrous, smooth; cystoliths only beneath; midrib slightly prominent to flat above, lateral veins 10–17 pairs, the basal pair hardly or not distinct, tertiary venation reticulate, in large leaves to loosely (sub)scalariform, the smaller veins almost flat beneath; waxy glands in the axils of the basal lateral veins, often partly on the midrib; petiole (0.5–)1–3 cm long, glabrous, the epidermis persistent (or flaking off); stipules (1–)2–7 cm long, glabrous, caducous. *Figs* axillary, solitary or in pairs; 0.2–1.5 cm long pedunculate; basal bracts 3, verticillate (or ± scattered on the peduncle), c. 1 mm long, persistent; receptacle subglobose, (1–)1.5–3 cm diam. when dry, (1.5–)2.5–4.5 cm diam. when fresh, 0–1.5 cm long stipitate, glabrous, yellow at maturity, apex convex, ostiole 1–1.5 mm diam., flat or slightly sunken; internal hairs absent. *Tepals* red, glabrous. *Stamens* 1 or 2.

Distribution — From the Philippines to the Solomon Islands; in *Malesia*: Philippines (Luzon, Leyte, Bohol, Mindanao), Moluccas (Ceram, Halmahera, Kai Islands, Sula), New Guinea, New Ireland.

Habitat — Forest, at altitudes up to c. 1000 m, often common and gregarious.

Note — This species can be distinguished by the (sub)distichous leaves and the (usually) persistent epidermis of the petiole.

14. **Ficus pseudojaca** Corner

Ficus pseudojaca Corner, Gard. Bull. Singapore 17 (1960) 413; 21 (1965) 32; Philos. Trans., Ser. B, 259 (1970) 389, t. 2, 3.

Tree up to c. 35 m tall, with buttresses up to 2 m. *Branchlets* drying (dark) brown to blackish. *Leafy twigs* 2–4 mm thick, solid, ± angular, densely brown puberulous to tomentose. *Leaves* spirally arranged to (sub)distichous; lamina oblong to subovate to elliptic, (7–)10–22 by 4–14 cm, ± asymmetric (to symmetric), coriaceous, apex (sub)acuminate, base inequilateral (to equilateral), narrowly cordate to auriculate, margin entire, ± revolute; upper surface puberulous to tomentose, mainly on the midrib, dull when dry, lower surface brown tomentose to subvillous or to puberulous on the veins, smooth; cystoliths only beneath; midrib slightly prominent to almost flat above, lateral veins 10–16 pairs, often ± impressed above, the basal pair hardly or not distinct, tertiary venation scalariform, the smaller veins ± prominent beneath; waxy glands in the axils of the basal lateral veins; petiole 0.5–2 cm long, brown (sub)tomentose, the epidermis flaking off (sooner or later); stipules 1–2(–3.5) cm long, densely brown(ish) subsericeous, caducous. *Figs* axillary, in pairs (?); peduncle 0.1–0.3 cm long; basal bracts 3, scattered on the peduncle, c. 1 mm long, persistent; receptacle subglobose, 1–1.2 cm diam. when dry, non-stipitate, densely brown puberulous, green (?) at maturity, apex convex, ostiole c. 1.5 mm diam. (?), slightly prominent (?); internal hairs abundant. *Pedicels* hairy. *Tepals* red, glabrous. *Stamen* 1. — **Fig. 35.**

Distribution — New Guinea.

Habitat — Forest, at low altitudes.

15. **Ficus saruensis** C.C. Berg

Ficus saruensis C.C. Berg, Blumea 48 (2003) 294.

Treelet up to 3 m tall. *Branchlets* drying (dark) brown. *Leafy twigs* 2–3 mm thick, solid, ± angular, brown subtomentose. *Leaves* spirally arranged to subdistichous; lamina oblong to lanceolate, 14–22 by 4–8.5 cm, symmetric, coriaceous, apex (sub)acuminate, base rounded to cuneate to subattenuate, margin entire, towards the base slightly revolute; upper surface (very) sparsely puberulous on the midrib, ± shining when dry, lower surface subtomentose on the main veins, smooth; cystoliths only beneath; midrib slightly prominent to flat above, lateral veins 12–15 pairs, slightly impressed to flat, the basal pair ± distinct, tertiary venation reticulate to subscalariform, the smaller veins slightly prominent beneath; waxy glands in the axils of the basal lateral veins; petiole (0.5–)1–1.5 cm long, brownish subtomentose, the epidermis flaking off; stipules 2–3.5 cm long, densely brown appressed-puberulous to subglabrous, caducous. *Figs* axillary, in pairs or solitary, sessile; basal bracts 3, verticillate, 2–4 mm long, persistent; receptacle subglobose, 0.7–1.2 cm diam. when dry, non-stipitate, sparsely puberulous, greenish at maturity, apex convex, ostiole c. 1.5 mm diam., ± prominent; internal hairs absent. *Tepals* red, glabrous. *Stamens* (1 or) 2.

Distribution — New Guinea (eastern).

Habitat — Forest, at altitudes up to c. 750 m.

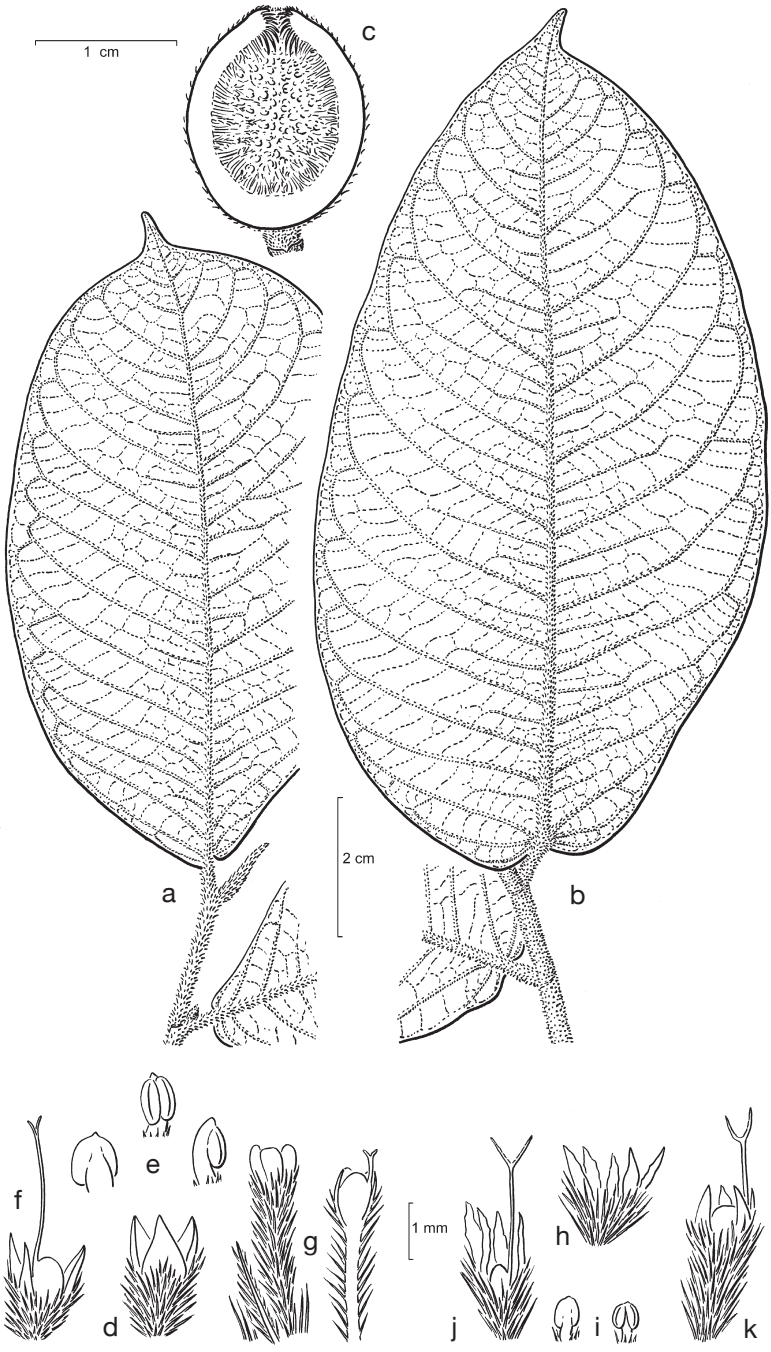


Fig. 35. *Ficus pseudojaca* Corner. a, b. Leafy twigs; c. fig; d, h. staminate flowers; e, i. stamens; f, j. long-styled flowers; g, k. short-styled flowers (a: *BW 6669*; b–g: *NGF 25584*; h–k: *Hartley 11335*). From Philos. Trans., Ser. B, 259 (1970) 389, 390.

16. Ficus sclerosycia C.C. Berg

Ficus sclerosycia C.C. Berg, Blumea 48 (2003) 296.

Tree up to c. 30 m tall. *Branchlets* drying (dark) brown to blackish; scars of the petioles prominent. *Leafy twigs* 2.5–4 mm thick, solid, angular, sparsely and minutely appressed-puberulous. *Leaves* spirally arranged; lamina elliptic to oblong, 4.5–7 by 2–4 cm, symmetric, coriaceous, apex obtuse, base equilateral, obtuse to rounded, margin entire, revolute; upper surface glabrous, dull when dry, lower surface glabrous, smooth; midrib almost flat and the lateral and smaller veins slightly prominent and conspicuous above, lateral veins 7–9 pairs, the basal pair not or slightly distinct, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins almost flat beneath; waxy glands in the axils of the basal lateral veins; petiole 0.6–1 cm long, glabrous, the epidermis flaking off; stipules 1–1.5 cm long, densely brownish appressed-puberulous, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.2–0.3 cm long; basal bracts (2 or) 3, verticillate or scattered on the peduncle up to the base of the receptacle, 1–1.5 cm long, persistent; receptacle subglobose, 1.5–1.8 cm diam. when dry, (sub)glabrous, green (?) at maturity, apex convex to slightly umbonate, ostiole c. 2 mm diam., slightly prominent; wall 2–5 mm thick, in the middle thicker and dividing the cavity into two compartments; internal hairs absent. *Tepals* (dark) red, glabrous. *Stamens* 2.

Distribution — New Guinea (eastern).

Habitat — Forest, at c. 1650 m (type collection) altitude.

Note — This species shows close affinities to *F. pachysycia*, as in the shape and venation of the lamina and in the thick-walled fig receptacle, but both the lamina and the fig receptacle are so much smaller that it is not likely that it could be a small-leafed form of *F. pachysycia*.

17. Ficus subcaudata C.C. Berg

Ficus subcaudata C.C. Berg, Blumea 48 (2003) 298.

Tree up to 8 m tall. *Branchlets* drying (dark) brown, drooping. *Leafy twigs* 1–2 mm thick, solid, slightly angular to subterete, glabrous. *Leaves* spirally arranged to subdistichous; lamina elliptic to oblong, 4–13 by 1.5–5 cm, ± asymmetric, coriaceous, apex subcaudate, base inequilateral to equilateral, cuneate to obtuse, margin entire, flat; upper surface glabrous, dull when dry, lower surface glabrous, smooth; midrib almost flat above, lateral veins 9–11 pairs, the basal pair hardly or not distinct, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins; petiole 0.4–1.2 cm long, glabrous, the epidermis flaking off; stipules 1–1.5 cm long, glabrous, caducous. *Figs* axillary, solitary, sessile; basal bracts 3, verticillate, c. 1.5 cm long, persistent; receptacle subglobose, c. 1.5 cm diam. when dry, non-stipitate, glabrous, red at maturity, apex convex, ostiole 2–2.5 mm diam., slightly prominent; wall thick; internal hairs absent. *Tepals* (dark) red, glabrous. *Stamen* 1.

Distribution — New Guinea (western).

Habitat — Limestone cliffs; at altitudes of 1300–1400 m (two collections).

Note — This species is distinctive by its small, ± asymmetric lamina with a long acumen, and probably also by the slender (usually?) drooping branches and the habitat (limestone rock).

18. **Ficus subnervosa** Corner

Ficus subnervosa Corner, Gard. Bull. Singapore 17 (1960) 411; 21 (1965) 31.

Tree up to 25 m tall, without or with buttresses. *Branchlets* drying brown to greyish (leafy twigs sometimes blackish). *Leafy twigs* 1–3 mm thick, hollow, ± angular, glabrous. *Leaves* spirally arranged (to subdistichous); lamina oblong to elliptic to (sub)-obovate, (4–)8–22 by (1.5–)4–10 cm, symmetric, coriaceous, apex shortly and bluntly acuminate, base cuneate to subattenuate, margin entire, flat; upper surface glabrous, dull when dry, lower surface glabrous, smooth; cystoliths only beneath; midrib almost flat above, lateral veins (5–)7–10 pairs, the basal pair slightly or not distinct, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins flat beneath; waxy glands in the axils of the basal lateral veins; petiole (0.5–)1–2.5 cm long, glabrous, the epidermis flaking off; stipules (0.5–)1–2.8 cm long, glabrous, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.5–1.2 cm long; basal bracts 3, c. 1 mm long, often scattered on the peduncle, c. 1 mm long, persistent; receptacle subglobose, (0.7–)1–2 cm diam. when dry, 1.5–3 cm diam. when fresh, non-stipitate, very sparsely and minutely whitish puberulous to glabrous, red at maturity, apex convex, ostiole 1.5–2 mm diam., slightly prominent to flat; internal hairs absent. *Tepals* red, glabrous. *Stamen* 1.

Distribution — New Guinea.

Habitat — Forest, at low altitudes.

Note — This species resembles *F. nervosa*, from which it differs in the absence of indumentum on all vegetative parts and in the pedunculate figs with the basal bracts scattered on the peduncle.

19. **Ficus subtrinervia** Lauterb. & K. Schum.

Ficus subtrinervia Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 271; Diels, Bot. Jahrb. Syst. 67 (1935) 184; Corner, Gard. Bull. Singapore 21 (1965) 32.

Ficus mangiferifolia Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 275; Diels, Bot. Jahrb. Syst. 67 (1935) 192; Summerh., J. Arnold Arbor. 22 (1941) 88, non Griff. 1854.

Ficus pachystemon Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 242; Diels, Bot. Jahrb. Syst. 67 (1935) 184; Corner, Gard. Bull. Singapore 17 (1960) 412; 21 (1965) 32: Philos. Trans., Ser. B, 253 (1967) 83, t. 19.

Ficus brassii Summerh., J. Arnold Arbor. 10 (1929) 146, non Sabine 1824. — *Ficus aechmophylla* Summerh., J. Arnold Arbor. 14 (1933) 62.

Ficus saxicola Summerh., J. Arnold Arbor. 10 (1929) 147.

Ficus doormaniana Diels, Bot. Jahrb. Syst. 67 (1935) 192. — *Ficus subtrinervia* Lauterb. & K. Schum. var. *doormaniana* (Diels) Corner, Gard. Bull. Singapore 17 (1960) 412.

Ficus behrmanniana Diels, Bot. Jahrb. Syst. 67 (1935) 192.

Tree up to c. 40 m tall, with buttresses up to 1.30 m. *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, solid or hollow, ± angular, densely minutely brownish to whitish puberulous to glabrous. *Leaves* spirally arranged to subdistichous;

lamina oblong to subovate to lanceolate (or to elliptic), (2.5–)5–15(–20) by (1.2–)2–6.5(–7.5) cm, (almost) symmetric, (sub)coriaceous, apex equilateral to ± inequilateral, subacuminate to acute (or to subcaudate), base rounded to cuneate to subattenuate, margin entire, ± revolute, ciliolate and glabrescent or glabrous; upper surface glabrous, dull to ± shining when dry, often drying greenish to greyish, lower surface glabrous or (very sparsely) appressed-puberulous on the midrib, smooth; cystoliths only beneath; midrib almost flat above, lateral veins 9–16 pairs, the basal pair distinct, departing from the midrib in acute angles, the others at angles up to 90°, tertiary venation largely parallel to the lateral veins, creating 1–3 secondary lateral veins in between the major ones, often running into the 'marginal vein', the smaller veins flat to slightly prominent beneath; waxy glands in the axils of the basal lateral veins, often partly on the midrib and/or extending downwards; petiole 0.5–1.5(–2) cm long, appressed-puberulous or

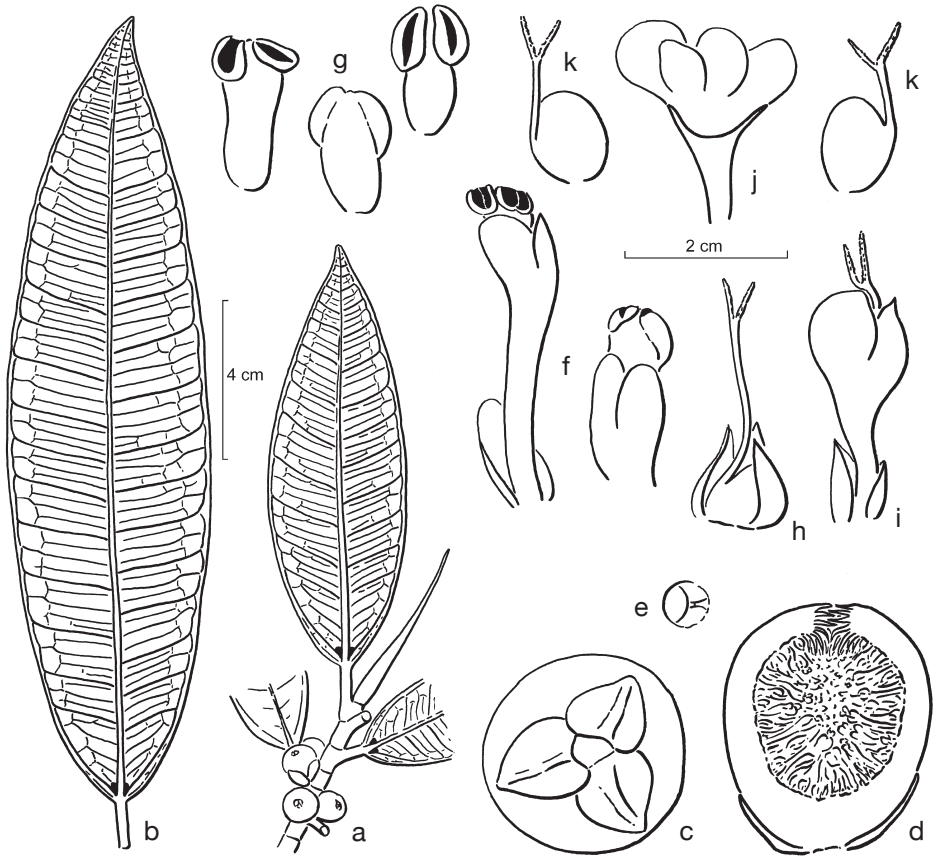


Fig. 36. *Ficus subtrinervia* Lauterb. & K. Schum. a. Leafy twig with figs; b. leaf; c. basal bracts; d. fig; e. ostiole; f. staminate flower and interfloral bract; g. stamens; h. long-styled flower; i. short-styled flower and interfloral bracts; j. pedicel and perianth of short-styled flower; k. developing pistils of short-styled flower (a, b: *Brass 23935*; c–k: *Carr 12416*). From Philos. Trans., Ser. B, 253 (1967) 83.

glabrous, the epidermis sooner or later flaking off (or persistent?); stipules 1–4(–6) cm long, densely brownish to yellowish appressed-puberulous to glabrous, caducous. *Figs* axillary, in pairs, sessile; basal bracts 3, verticillate, 1.5–4 mm long, persistent; receptacle subglobose, 0.6–1(–1.2) cm diam. when dry, 1.5–2 cm diam. when fresh, non-stipitate, glabrous, red to scarlet at maturity, apex convex, ostiole 1–1.5 mm diam., mostly slightly prominent; internal hairs absent. *Tepals* red(dish), glabrous. *Stamen* 1. — **Fig. 36.**

Distribution — From Celebes to the Solomon Islands; in *Malesia*: Celebes and New Guinea incl. New Britain and the Admiralty Islands.

Habitat — Forest, often riverine, at altitudes up to 1200 m.

Uses — Bark is used to make cloth (New Britain)

Notes — 1. The species is represented by a form with lanceolate laminas, often with a long acumen, and a form with oblong (to elliptic) laminas, described as *F. pachystemon* and *F. subtrinervia*, respectively. The material with lanceolate laminas comes from shrubs or trees up to 10 m tall, mostly occurring on river banks and in (rocky) river beds, less commonly on cliffs. Lanceolate laminas apparently represent a (sub)juvenile trait (cf. *Henty NGF 20509*); oblong and lanceolate laminas can be found on the same branch (*Brass 13222*). The narrow laminas can be related to the habitat of flood-swept river beds, in which the plants can be rheophytic (see Van Steenis, Rheophytes of the world (1981) 300, 304, t. 36a). The material with oblong laminas comes from taller trees (15–40 m tall) occurring in forest.

2. The leafy twigs with lanceolate laminas are sometimes covered with a waxy layer.

Section Oreosycea subsection Pedunculatae

Ficus L. subg. *Pharmacosycea* (Miq.) Miq. sect. *Oreosycea* (Miq.) Miq. subsect. *Pedunculatae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 179.

Ficus L. sect. *Leiosycea* Miq., London J. Bot. 7 (1848) 454; Fl. Ind. Bat. 1, 2 (1859) 315.

Ficus L. sect. *Stilpnophyllum* Endl. subsect. *Pedunculatae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 179.

Ficus L. subg. *Pharmacosycea* (Miq.) Miq. sect. *Oreosycea* (Miq.) Miq. ser. *Vasculosae* Corner, Gard. Bull. Singapore 17 (1960) 406.

Ficus L. subg. *Pharmacosycea* (Miq.) Miq. sect. *Oreosycea* (Miq.) Miq. ser. *Vasculosae* Corner subser. *Vasculosae* Corner, Gard. Bull. Singapore 17 (1960) 406.

Ficus L. subg. *Pharmacosycea* (Miq.) Miq. sect. *Oreosycea* (Miq.) Miq. ser. *Vasculosae* Corner subser. *Albipilae* Corner, Gard. Bull. Singapore 17 (1960) 406.

Indumentum whitish. *Leaves* spirally arranged; lamina often drying greenish, when juvenile the margin (often) lobate or dentate, cystoliths only beneath or on both sides; basal lateral veins hardly or not distinct; waxy glandular spots lacking; petioles varying in length on the same twig or not; stipules relatively short. *Fig receptacle* often with a very smooth surface, without or with internal hairs. *Staminate flowers* near the ostiole.

Distribution — The subsection comprises 9 species, of which 5 in Asia, 2 in Madagascar (*F. ampana* C.C. Berg, *F. assimilis* Baker) and 2 in continental Africa (*F. dicranostyla* Mildbr., *F. variifolia* Warb.). In Asia, *F. capillipes* Gagnep. is confined

to the Asian mainland, the others extend to Malesia, *F. albipila* even to Australia, or are confined to the Malesian region (*F. bataanensis*).

Morphology — Minute and brown pluricellular trichomes are conspicuous in many species.

Subdivision — Two groups of species can be distinguished:

a. *Ficus albipila*-group (subser. Albipilae) — It comprises *F. albipila* and *F. capillipes*, the two continental African species, and the Madagascan *F. assimilis*. They have subcoriaceous to coriaceous and hairy laminas, dull above when dry and with hairs on the inner surface of the fig receptacle.

b. *Ficus vasculosa*-group (subser. Vasculosae) — It comprises *F. bataanensis, F. callosa, F. vasculosa*, and the Madagascan *F. ampana*. They have stiff-coriaceous and glabrous laminas, usually shining and with the venation rather conspicuous above when dry and glabrous on the inner surface of the fig receptacle.

20. Ficus albipila (Miq.) King

Ficus albipila (Miq.) King, Sp. Ficus 2 (1888) 179; Corner, Gard. Bull. Singapore 17 (1960) 408; Philos. Trans., Ser. B, 259 (1970) 392, t. 5; Backer & Bakh.f., Fl. Java 2 (1965) 30. — *Covellia albipila* Miq., Fl. Ind. Bat., Suppl. (1861) 175, 434. — *Ficus mollis* (Miq.) Miq. var. *albipila* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; Corner, Gard. Bull. Singapore 21 (1965) 29.

Morus leucophylla Miq., Fl. Ind. Bat., Suppl. (1861) 415.

Ficus colossea F. Muell. ex Benth., Fl. Austral. 6 (1873) 163; F.M. Bailey, Queensl. Fl. 5 (1902) 1467; Compr. Cat. Qld. Pl. (1913) 485; Maiden, For. Fl. NSW 6 (1916) 226; Kochummen, Tree Fl. Malaya 3 (1978) 139; Tree Fl. Sabah & Sarawak 3 (2000) 257.

Ficus mallotoides Valeton ex Backer, Blumea 6 (1948) 304, non Mildbr. & Hutch. 1915.

Ficus albipila (Miq.) King var. *glabra* Corner, Gard. Bull. Singapore 17 (1960) 408.

Ficus microtricherinos Backer & Bakh.f., Fl. Java 2 (1965) 30, in syn.

Ficus cordifolia auct. non Blume: Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 57, 60; Valeton, Ic. Bog. 3 (1908) t. 266; Koord., Atlas Baumart. Java 4 (1916) t. 701.

Tree up to 40 m tall, with buttresses up to 5 m high. *Branchlets* drying brown. *Leafy twigs* 2–4 mm thick, solid, densely to sparsely white puberulous to subtomentose. *Leaves* spirally arranged; the lamina oblong to elliptic to subovate or to ovate, (4–)10–20(–24) by (2–)4–10(–14) cm, symmetric, 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 to subtomentose to hirtellous on the veins; cystoliths on both sides; midrib almost flat above, lateral veins (6–)10–14 pairs, the basal lateral veins up to 1/20 to 1/10 the length of the lamina, (faintly) branched, most other lateral veins branched or furcate far from the margin, tertiary venation scalariform, the smaller veins (almost) flat 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, 0–0.1 cm long stipitate, sparsely to densely white puberulous to tomentose, yellow to pink to red at maturity, apex slightly

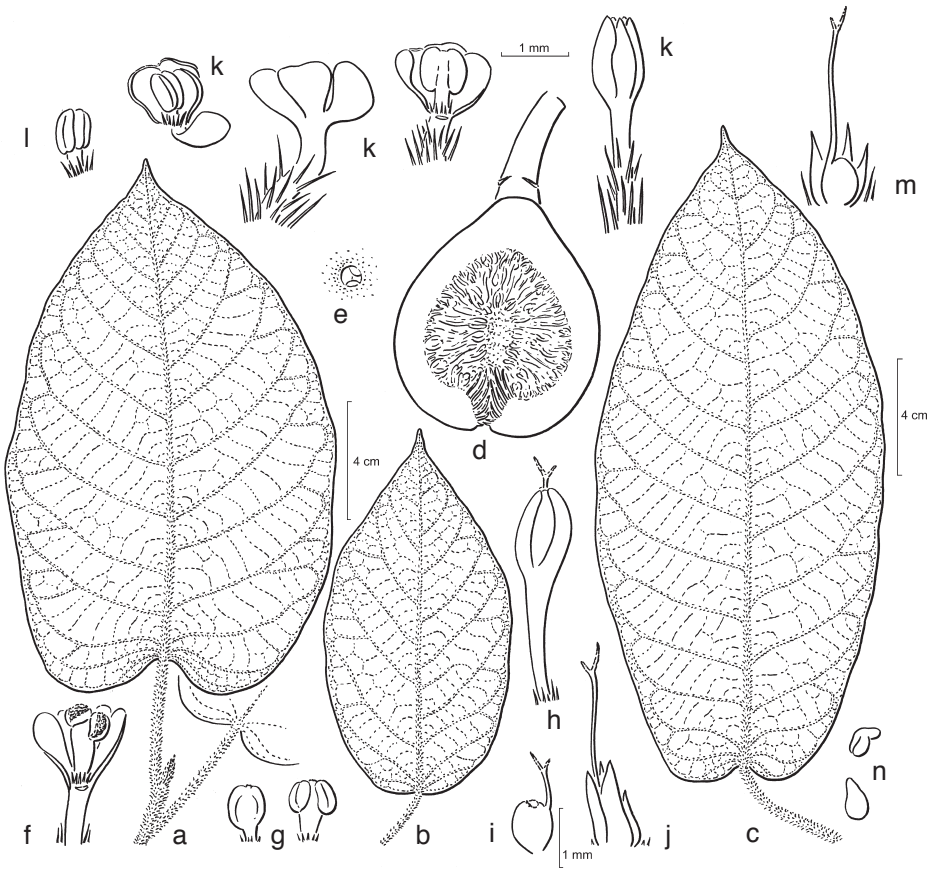


Fig. 37. *Ficus albipila*. (Miq.) King. a. Leafy twig; b, c. leaves; d. fig; e. ostiole; f–k. staminate flowers; g, l. stamens; h. short-styled flower; i. 'gall-fruit', opened; j, m. long-styled flowers; n. embryos (a–d: *SF 31641*; e: *Horsfield 382*; f–j, n: *Corner s.n.*; k–m: *Carr 12255*). From Philos. Trans., Ser. B, 259 (1970) 393.

umbonate, ostiole 1–1.5 mm diam., prominent; internal hairs abundant, long. *Tepals* reddish, glabrous. *Stamens* 1 (or 2). — **Fig. 37, 38.**

Distribution — From Thailand to Australia (Queensland); in *Malesia*: Malay Peninsula, Sumatra, Java, Lesser Sunda Islands (Flores, Alor, Timor), New Guinea.

Habitat — Wet or seasonal dry forest, at altitudes up to c. 1200 m, rare.

Notes — 1. The margin of the lamina of juvenile specimens can be dentate.

2. Trees can be deciduous (in New Guinea).

21. Ficus bataanensis Merr.

Ficus bataanensis Merr., Philipp. J. Sci., 1, Suppl. (1906) 46; Elmer, Leafl. Philipp. Bot. 2 (1908) 536; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 46; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 190; Corner, Gard. Bull. Singapore 21 (1965) 30.

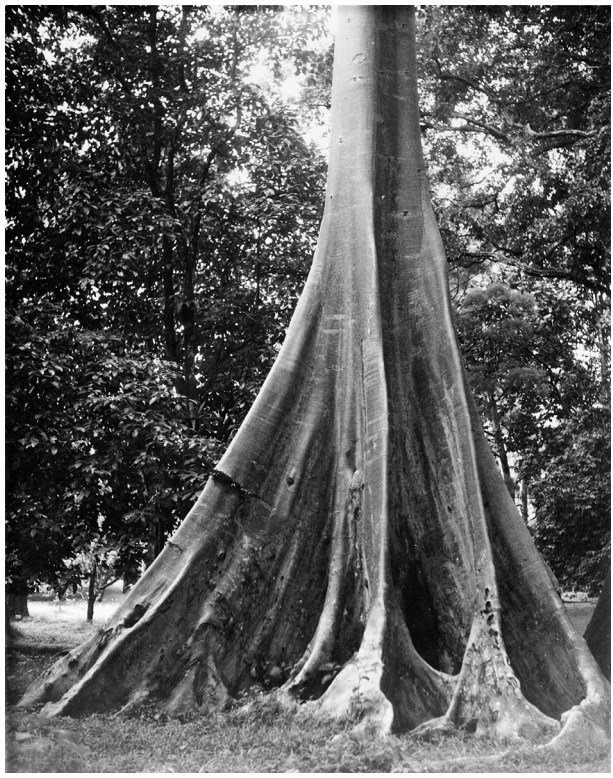


Fig. 38. *Ficus albipila* (Miq.) King. Lower part of the trunk with buttresses, Kebon Raya, Bogor. Photo E.J.H. Corner.

Ficus bataanensis Merr. forma *minima* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 190.
Ficus bataanensis Merr. forma *sorsogensis* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 190.

Tree up to 20 m tall. *Branchlets* drying brown to yellowish or greyish. *Leafy twigs* 2–3 mm thick, solid, minutely whitish puberulous. *Leaves* spirally arranged; lamina oblong to lanceolate, 4–12 by 1–5.5 cm, symmetric, coriaceous, apex shortly and bluntly subacuminate to rounded, base obtuse to cuneate, margin entire, flat, callose; upper surface glabrous, shining when dry, lower surface (sub)glabrous (but with numerous minute brown pluricellular hairs), smooth; cystoliths only beneath; midrib (almost) flat above, lateral veins 10–14 pairs, the basal lateral veins up to 1/20 to 1/6 the length of the lamina, unbranched, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins slightly prominent beneath; waxy glands absent; petiole 0.3–2.2 cm long, 1–1.5 mm thick when dry, similar in length on the same twig, the epidermis flaking of or persistent; stipules 0.5–1.2 cm long, minutely puberulous, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.6–1 cm long; basal bracts 3, 0.5–1 mm long, caducous or subpersistent; receptacle subglobose, (0.8–)1–1.5 cm diam. when dry, 0–0.2 cm long stipitate, sparsely minutely puberulous, dark red to purple-violet at maturity, apex

convex, ostiole c. 1 mm diam., prominent; internal hairs absent. *Tepals* red, glabrous. *Stamens* 1 or 2.— **Map 2.**

Distribution — Philippines (Luzon, Negros, Palawan).

Habitat — Forest, at altitudes up to c. 1000 m.

Notes — 1. Minute brown pluricellular oblongoid-capitate trichomes are abundant on most young parts.

2. This species shows close affinities to *F. vasculosa*.

22. Ficus callosa Willd.

Ficus callosa Willd., Acta Acad. Berol. (1798) 102, t. 4; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; Kurz, Forest Fl. Burma 2 (1877) 454; King, Sp. Ficus 1 (1887) 64, t. 85; Fl. Brit. India 5 (1888) 516; Koord., Minah. (1898) 597; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 144; Koord., Atlas Baumart. Java 4 (1916) t. 747; Merr., J. Straits Branch Roy. Asiat. Soc. 76 (1917) 81; Enum. Born. (1921) 221; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 568; Gagnep., Fl. Indo-Chine 5 (1928) 773; Steenis, Blumea 6 (1948) 259; Worth., Ceylon Trees (1959) t. 404; Backer & Bakh.f., Fl. Java 2 (1965) 267; Corner, Gard. Bull. Singapore 21 (1965) 29; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 143, t. 19; Kochummen, Tree Fl. Malaya 3 (1978) 142, t. 7; Tree Fl. Sabah & Sarawak 3 (2000) 264, t. 7.

Ficus scleroptera Miq., Pl. Jungh. (1851) 63; Fl. Ind. Bat. 1, 2 (1859) 314; Fl. Ind. Bat., Suppl. (1861) 431.

Ficus basidentula Miq., Fl. Ind. Bat. 1, 2 (1859) 314; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295.

Ficus cinerascens Thwaites, En. Pl. Zeyl. (1861) 266.

Ficus porteana Regel, Gartenfl. 11 (1862) 280, t. 372; Gagnep., Fl. Indo-Chine 5 (1928) 774; Merr., J. Arnold Arbor. 35 (1954) 134.

Ficus malunuensis Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 196; Elmer, Leafl. Philipp. Bot. 1 (1906) 246; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 56; Curran, Philipp. J. Sci. 53 (1934) t. 3; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 189.

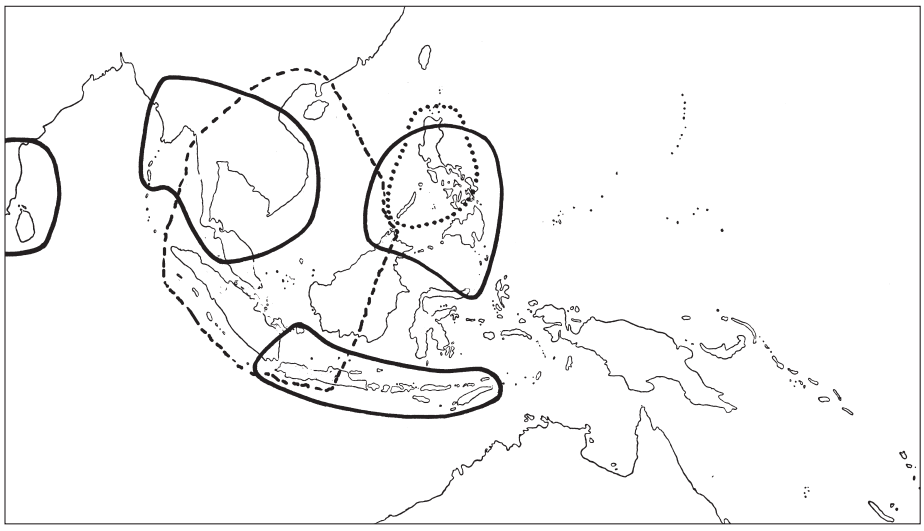
Ficus cordatifolia Elmer, Leafl. Philipp. Bot. 4 (1911) 1250.

Ficus longespathulata Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 323, t. 51 t. 2–4, t. 52, t. 1.

Ficus longespathulata Sata var. *elongatospathulata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 323, t. 51, t. 2.

Ficus longespathulata Sata var. *grandifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 323, t. 1.

Tree up to 45 m tall, with buttresses. *Branchlets* drying dark brown; scars of the stipules prominent. *Leafy twigs* 3–8 mm thick, solid, sparsely minutely puberulous to glabrous. *Leaves* spirally arranged; lamina elliptic to oblong to subobovate, (8–)10–30(–45) by (4–)5–15(–25) cm, (almost) symmetric, coriaceous, apex shortly and bluntly acuminate to rounded, base equilateral to slightly inequilateral, broadly to narrowly subcordate to rounded to subattenuate, margin entire (or lobate when juvenile), ± revolute; upper surface glabrous, shining when dry, lower surface glabrous, scabridulous; cystoliths only beneath; midrib slightly prominent to flat above, lateral veins (6–)9–12 pairs, the basal lateral veins up to 1/10 to 1/6 the length of the lamina, faintly or not branched, most other lateral veins branched or furcate far from the margin, tertiary venation (± loosely) scalariform, the smaller veins (almost) flat 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



Map 2. Distribution of some species of subg. *Pharmacosycea* subsect. *Pedunculatae*: *F. bataanensis* Merr. (dotted line); *F. callosa* Willd. (continuous line); *F. vasculosa* Miq. (broken line).

(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 to ovoid to 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 1–1.5 mm diam., prominent; internal hairs absent. *Tepals* reddish, glabrous. *Stamens* (1 or) 2.— **Map 2.**

Distribution — South Asia (Sri Lanka, India, Myanmar, Indochina, Thailand, Andaman Islands), Malesia; in *Malesia*: Malay Peninsula, Sumatra, Java, Lesser Sunda Islands (Bali, Sumbawa, Sumba, Timor, Flores, Wetar, Alor), Borneo (northern), Philippines, Celebes, Moluccas (Sula Islands).

Habitat — Forest, at low altitudes.

Uses — Bark is used for cloth; figs are eaten cooked; wood is used to make boxes and plywood.

Notes — 1. The distribution is disjunct, with as partial areas: 1) Sri Lanka and southern India; 2) the Sino-Himalayan region; 3) the Philippines and both north-eastern Borneo and Celebes, Java, the Lesser Sunda Islands, and south-eastern Sumatra.

2. The lamina of juvenile plants can be oblong to lanceolate, up to 60 by 23 cm, with up to 22 pairs of lateral veins, and the margin ± lobate and at the base spinulose-dentate.

23. **Ficus vasculosa** Miq.

Ficus vasculosa Wall. ex Miq., London J. Bot. 7 (1848) 454; Pl. Jungh. (1851) 61; Fl. Ind. Bat. 1, 2 (1859) 315; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; Kurz, Forest Fl. Burma 2 (1877) 453; King, Sp. Ficus 1 (1887) 65, t. 86; Fl. Brit. India 5 (1888) 517; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 468; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 147; Renner, Bot. Jahrb. Syst.

39 (1907) 382; Ridl., Fl. Malay Penins. 3 (1924) 337; Gagnep., Fl. Indo-Chine 5 (1928) 815; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1016; Corner, Wayside Trees (1940) 684; Backer & Bakh. f., Fl. Java 2 (1965) 33; Corner, Gard. Bull. Singapore 21 (1965) 30.

Ficus championii Benth. in Hooker's J. Bot. Kew Gard. Misc. 6 (1854) 76; Benth., Fl. Hongk. (1861) 328; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; Gagnep., Fl. Indo-Chine 5 (1928) 770.

Ficus vasculosa Miq. var. *acuminata* Miq., Pl. Jungh. (1851) 61; Fl. Ind. Bat. 1, 2 (1859) 316; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; Koord., Atlas Baumart. Java 4 (1916) t. 748 (as *Ficus vasculosa*).

Ficus renitens Miq., Fl. Ind. Bat. 1, 2 (1859) 317. — *Ficus variabilis* Miq. var. *integrifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 274.

Ficus variabilis Miq., Fl. Ind. Bat. 1, 2 (1859) 310; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 274, 292.

Tree up to 20 m tall, without or with 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, symmetric, 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 beneath; midrib slightly prominent to flat 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 slightly prominent beneath; waxy glands absent; petiole (0.7–)1–4(–7) 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 0.1–1 cm long; basal bracts 3, 0.5–1 mm long, persistent (or caducous); receptacle subglobose, 0.5–1 cm diam. when dry, 0–0.7 cm long stipitate, glabrous, green (?) at maturity, apex convex, ostiole 1–1.5 mm diam., flat; internal hairs absent. *Tepals* red, glabrous. *Stamens* (1 or) 2 (or 3). — **Map 2.**

Distribution — South Asia (Myanmar, S China, Indochina, Thailand), Malesia; in *Malesia*: Malay Peninsula, Sumatra, Java, Borneo (northern and western).

Habitat — Forest, at altitudes up to 1300 m.

Notes — 1. The apex of the lamina varies from shortly and bluntly acuminate to obtuse (mainly from the Asian mainland down to the Riouw Archipelago and Banka) to distinctly acuminate (elsewhere).

2. The lamina can be lobate in juvenile material (but also in adult specimens in S China (Hainan)).

3. Minute brown pluricellular oblongoid-capitate trichomes are abundant.

4. In most collections, the epidermis of the petiole is persistent, but of those in Palawan it is flaking off.

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FICUS subgenus SYCIDIUM

Ficus L. subg. *Sycidium* (Miq.) Mildbr. & Burret, Bot. Jahrb. Syst. 46 (1912) 174. — *Ficus* L. sect. *Sycidium* Miq., London J. Bot. 7 (1848) 228; Fl. Ind. Bat. 1, 2 (1859) 297; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; King, Sp. Ficus 2 (1888) 73; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 252. — *Ficus* L. subg. *Ficus* sect. *Sycidium* Miq.; Corner, Gard. Bull. Singapore 17 (1960) 443.

Necalistis Raf., Sylv. Tellur. (1838) 58.

Covellia Gasp., Giorn. Bot. Ital. 2 (1844) 218; Rendiconti Reale Accad. Sci. Fis. 25 (1845) 85; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 347.

Trees, tall to small, shrubs, or climbers (or creepers), terrestrial or (hemi-)epiphytic; with intermittent or continuous growth; milksap mostly white, sometimes watery. *Indumentum* often with stiff to rigid brown to whitish hairs, often with a ± strongly swollen base, or (intermixed) with shorter and often softer mostly whitish hairs, cystolith hairs common. *Leafy twigs* hollow or solid (with ample or scarce pith). *Leaves* spirally arranged or distichous, less commonly (sub)opposite (or subverticillate), often ± asymmetric, mostly chartaceous or/to subcoriaceous, mostly ± scabrous above and/or beneath, margin mostly dentate (to denticulate), or sometimes lobate; cystoliths present in the epidermis of both surfaces of the lamina or only beneath; lateral veins branched or furcate far from the margin or unbranched, basal pair often distinctly different from the other lateral veins, tertiary venation usually scalariform, in smaller leaves to reticulate; waxy glands on the lower surface of the lamina, in the axils of both main basal lateral veins (sometimes these two largely on the midrib and then occasionally fused), only in one of them, or sometimes a third in the axil of a lesser basal lateral vein, sometimes (smaller) ones in the axils of other lateral veins; petiole varying from long (and then usually differently in length on the same twig) to short; stipules semi-amplexicaul to lateral or amplexicaul, mostly small, caducous or (sub)persistent. *Figs* axillary, solitary, in pairs or on spurs, (ramiflorous) on spurs or woody tubercles on the lesser branches, or (cauliflorous) on spurs, woody tubercles, or (clusters of) short leafless branchlets with short internodes on the main branches and/or the trunk, rarely flagelliflorous (or geocarpic); figs mostly pedunculate, with peduncular bracts, 1–3, scattered, rarely 3 subtending the receptacle (as basal bracts), lateral bracts rather common, receptacle usually (sub)globose, mostly relatively small, mostly ± scabrous, ostiole relatively small and often surrounded by a rim or with a rosette of apical bracts pointing upwards; internal hairs present or absent. *Staminate flowers* near the ostiole in 1–several rows, tepals 3–6, red to whitish, glabrous or hairy (mostly only) at the apices; stamens 1 (or 2), anthers elliptic in outline, not apiculate; pistillode or short-styled pistil (always?) present. *Tepals* of pistillate flowers 3–6, free (or up to the middle connate), (dark to pale) red or whitish, glabrous or hairy (mostly only) at the apices. *Style* of long-styled flower glabrous or hairy. *Fruits* achene, lens-shaped to slightly bean-shaped, smooth or slightly tuberculate or punctate, often (slightly) keeled or drupelets with a whitish subtetrahedral to lens-shaped, tuberculate or smooth endocarp body; pseudohilum small and not prominent.

DISTRIBUTION AND ECOLOGY

Distribution — The subgenus occurs in an area ranging from French Polynesia to Micronesia, the Ryukyu Islands, S China and westwards to Madagascar (and adjacent islands) and continental Africa, westwards to Senegal. The subgenus comprises c. 115 species; 70 species are known from Malesia; c. 30 species are found in the Pacific and Australia, nearly 10 in Africa and Madagascar and only five are confined to the Sino-Himalayan region. *Ficus exasperata* Vahl occurs both in India and continental Africa (and the Arabian Peninsula). The subgenus is with 30 species well-represented in New Guinea, with the majority of the species belonging to sect. *Sycidium* to which nearly all species of subg. *Sycidium* in the Pacific and Australia also belong. In Borneo, 26 species are found, the majority belonging to sect. *Palaeomorphe*. With 23 species Celebes is almost as rich, with species of both sections almost equally represented. Most of the species of sect. *Sycidium* belong to groups centred in the eastern part of the range of the section, but those of the *F. heterophylla*-group and *F. montana*-group are centred in the western part of the range.

Habitat — The majority of the species are components of various, mostly humid types of forest, but many of them are frequently found in secondary growth, these and other species are also often found in riverine vegetation. A small number of species is associated with more open types of vegetation as grasslands, coastal habitats, and rocks. Many species are very common.

MORPHOLOGY

Habit — The habit varies from up to 30–35 m tall trees (e.g. in *F. melinocarpa* and *F. primaria*) to small ones (as in the majority of the species) to shrubs, large to small, sometimes procumbent (as in *F. montana* and allied species). The species of sect. *Palaeomorphe* are often hemi-epiphytic. They establish close to the soil, up to some meters. In species that can become medium-sized to tall trees, *F. tinctoria* and *F. virgata* the root-system connecting them the soil can become extensive. In the other species, such as *F. pisifera* and *F. sinuata*, the hemi-epiphytes are shrubs, mostly connected with a single tap-root to the soil and with ± horizontal growing roots to anchor the shrub to the trunk of the host-tree. These species do often or sometimes exhibit other habits as well: terrestrial shrubs, small trees, scramblers, or climbers.

Most species of the sect. *Sycidium* show intermittent growth, evident from gradual reduction of length of the internodes towards the apex of a growth unit, shedding of the periderm from the twigs of the (leafless) previous growth unit and (consequently) change in colour, and often also from smaller or larger tufts of subpersistent stipules at the apex of the (present) growth unit. Whether intermittent growth usually is linked to deciduousness is not clear. In sect. *Sycidium* the leafy twigs are hollow or solid (and then usually with ample pith). The species of sect. *Palaeomorphe* show continuous growth and the leafy twigs are solid and ± angular to ± compressed. In this section, the periderm usually also flakes off below the leaf-bearing part of the twigs.

Indumentum — The hairs are predominantly rigid or stiff, partly causing scabrous surfaces. In particular in the *F. ulmifolia*-group, in which the cystoliths occur on both sides of the lamina, ± scabrous upper surfaces are often caused by cystolith hairs. The rigid hairs often have swollen bases in the *F. ulmifolia*-group. In (most) species of the *F. conocephalifolia*-group the rigid hairs are long (setose) and easily break off and are irritant. The colour of the stiff hairs varies from dark brown and purplish to whitish. The subgenus is characterized by the common occurrence of scabrous surfaces, as those of the lamina and leafy twigs, but even more frequently so of the fig receptacle.

Cystoliths — Occur on both side of the lamina or only beneath. Even in groups of closely related species, such as the *F. conocephalifolia*-group, both states occur. Cystolith hairs are often present in sect. *Sycidium.*

Leaves — The majority of the species have alternate and distichous leaves, in a smaller number of species the leaves are spirally arranged. In both cases they can be (sub)opposite or occasionally subverticillate. In some species, *F. opposita* and *F. cumingii,* the leaves are mostly more frequently (sub)opposite than alternate. In some species transitions from the predominant distichous arrangement of the leaves to an arrangement in lax spirals can be found. The lamina is often asymmetric, pronouncedly so or slightly so, and then often only at the base. In sect. *Palaeomorphe* asymmetry is generally expressed in the fact that one side of the base is decurrent, and thus the two sides of the lamina base attached to the petiole at different distances from its base. The decurrent part can be extended by an auricle (partly) concealing the petiole or also part of the leafy twig, by a lobe (in *F. aurita)* or a strip of mesophyll along the petiole.

The tertiary venation is basically scalariform, but varies to reticulate in particular in small leaves. The basal lateral veins are mostly distinct in length and/or the angle of departure from the midrib. The lateral veins are often branched.

The margin of the lamina is mostly dentate. In several species (e.g., *F. cumingii* and *F. montana* they can be pinnately lobate, in particular when juvenile.

Waxy glands — They are usually present in the axils of the (main) basal lateral veins, either in both or only in one of them. In some species, *F. elmeri*, *F. erinobotrya*, *F. fiskei*, and *F. odorata*, all with strongly asymmetric bases of the lamina, the narrow side has one waxy gland, and the broad side two, one in the axil of the main basal lateral veins and the other in the axil of a smaller lateral vein below the main basal one. Several species have usually smaller additional glands in the axils of other lateral veins, unilaterally or bilaterally. In *F. subulata*, the additional glands are relatively large, and may replace the basal waxy gland. In some species the glands occur largely on the midrib, and may be fused into a single median one as in *F. schumanniana* (thus similar to the situation in subg. *Urostigma*!). In some species, *F. badiopurpurea* and *F. eustephana*, waxy glands are absent.

Petiole — The petiole is mostly relatively short. But in the group with spirally arranged leaves, they are often long, and, moreover, usually quite variable in length on the same twig.

Stipules — The for the genus characteristic fully amplexicaul stipules, leaving annular scars, are absent in the majority of the species of this subgenus. They are semi-amplexicaul to lateral, and the scars do not meet opposite the petiole. However, in about 19 out of 70 Malesian species the stipules are always fully amplexicaul, but in some of these species (e.g., *F. ampelas* and *F. asperiuscula*) the stipules are sometimes semi-amplexicaul, whereas in *F. heteropleura* both states occur about equally frequent. In most of the species the stipules are small, mostly up to 1 cm.

Mesophyll-fibres — They occur in a number of species of sect. *Palaeomorphe* (see Corner, Gard. Bull. Singapore 17 (1960) 448).

Position of the figs — In most species the figs are axillary, in pairs, solitary, or clustered on short-shoots. These short-shoots usually continue to produce figs below the leaves, establishing ramiflory. In many species these spurs ramify, forming woody tubercles, or they may become up to 10 cm and establish cauliflory. These elongate branchlets are leafless and often clustered. Cauliflory can be found on the branches or down to the trunk; it is rarely confined to the trunk. Combinations of the axillary position of the figs and ramiflory and/or cauliflory are common. Cauliflory is distinct from that in subg. *Sycomorus*, as the fig-bearing branchlets never have long internodes, and thus are usually not longer than some centimetres or at most 10 cm. Flagelliflory (geocarpy) is only found in *F. badiopurpurea* and *F. funiculicaulis*, but whether it is similar to flagelliflory in subg. *Sycomorus*, namely with leafless branches departing from the base of the trunk, is not certain. In the *F. subulata*-group accidental geocarpy occurs by creeping branches in touch with or embedded in the soil, occasionally or possibly commonly as in *F. leptocalama*.

Features of the figs — The figs are mostly pedunculate. The receptacles are mostly small, up to 1 cm diam. when dry; in sect. *Palaeomorphe* they or often very small, less than 0.5 cm diam. when dry. Large receptacles, more than 1.5 cm diam. when dry occur only in a few species, they are largest in *F. primaria*, 3–3.5 cm diam. when dry, 3.5–5 cm when fresh.

Below the receptacle the bracts occur mostly more or less scattered on the peduncle or at the base of the peduncle, and are, therefore, indicated as peduncular bracts (instead of basal bracts). Their number mostly varies from one to four, but three is the common number. These bracts are rarely arranged in whorls of three (or two) subtending the receptacle, as common in the other subgenera of *Ficus*. Bracts on the outer surface of the receptacle (lateral bracts) and around the ostiole (apical bracts) occur in many species. The bracts are mostly small, but large (or also numerous) in some species of the *F. conocephalifolia*-group.

In the majority of the species the receptacle turns red or reddish at maturity, purple and orange are less common colours of mature ‘seed-figs’.

Flowers — The perianth consists of 3–6 tepals, which are usually free, but in some species in the pistillate flowers basally or up to the middle connate. The colour varies from dark red (dark red-brown when dry) to pinkish (pale brown when dry) to white. In some species the colour is consistent, in others it may vary from dark red to whitish.

The tepals are mostly glabrous, less commonly minutely hairy at the apices or along the margins, or hairy outside. In species with hairs at the apices of the tepals the apices can be minutely denticulate. In some species (as *F. gracillima*) the tepals become indurate. The staminate flowers are found near the ostiole, in one or more rows. They mostly contain one stamen, sometimes 2, the anthers are c. 0.5 to c. 1 mm long and elliptic to ovate in outline. In sect. *Palaeomorphe* they mostly contain a short-styled pistil (which can function as a breeding site for fig wasps) or a more or less reduced one in particular in species with small figs. In sect. *Sycidium* the pistil is much reduced in size and non-functional. Pistillodes may consist of an ovary part and a style part down to just a minute cylindrical structure representing the stylar part. In pistillate flowers the style is usually glabrous, sometimes hairy.

Fruits — In the majority of the species the fruits are achenes, lens-shaped to slightly bean-shaped, clearly to faintly keeled, and smooth, or sometimes slightly tuberculate or finely punctate. They are mostly pale yellow to whitish, but in some species (*F. elmeri* and *F. odorata*) red(dish). In some species (*F. montana*, *F. sandanakana*, and *F. subsidens*) the fruits are drupaceous, with a white exocarp and a whitish tuberculate or smooth endocarp body, which is (usually?) released from the exocarp at maturity. It is difficult to recognize these drupaceous fruitlets in dried material due to shrinking of the exocarp. Hence, the distribution of the two types of fruitlets in the subgenus is uncertain, and neither is it clear whether transitions from one type of fruit to the other occur.

POLLINATORS

Two genera of fig wasps are involved in the pollination in subg. *Sycidium*: *Kradibia* for species of sect. *Sycidium* and *Liporrhopalum* for species of sect. *Palaeomorphe*, but with a few exceptions in which pollinators associated with other subgenera of *Ficus* are recorded (Wiebes 1994: 116–146).

DELIMITATION AND SUBDIVISION

Delimitation — The delimitation is largely in accordance with that proposed by Corner (1960, 1965) for subg. *Ficus* sect. *Sycidium*. However, a few changes had to be made. Series *Pungentes*, with two species, *F. minahassae* and *F. pungens*, is currently included in subg. *Sycomorus* (see p. 373). *Ficus petrotica*, considered to be the third member of ser. *Pungentes*, is based on a mixed collection and by lectotypification included in the synonymy of *F. pungens*. The following subdivisions are included: sect. *Sinosycidium* with a single species (*F. tsiangii* Corner), regarded as a subdivision of subg. *Ficus* by Corner (1960, 1965), and subsect. *Ficus* ser. *Sinosyceae,* comprising two other species (*F. henryi* Diels and *F. subincisa* Sm.) of the Asian mainland (Corner 1960, 1965).

The subgenus is characterized by the frequent presence of semi-amplexicaul stipules, by the frequent absence of a whorl of (basal) bracts subtending the fig receptacle, and by the presence of a pistil or pistillode in the staminate flower in all species. Semi-amplexicaul stipules are absent in most other subgenera of *Ficus*, but also occur in some species of subg. *Ficus* sect. *Ficus* subsect. *Frutescentiae* (see p. 90). A whorl of basal

bracts occur in most other subgenera of *Ficus*, and are only lacking in some species of subg. *Sycomorus*, namely in those with numerous lateral bracts on the receptacle, which gradually pass in peduncular bracts (see p. 378). Irregularities in the position and number of (basal) bracts are found in some species of sect. *Oreosycea* (see p. 137).

Pistillodes are absent (or exceptional) in most other subgenera of *Ficus*. They are only common in the neotropical sect. *Pharmacosycea*, but here they are always cylindrical to subulate and do not consist of an 'ovary' part and a style, as usual in subg. *Sycidium*.

The common presence of asymmetric laminas is shared with subg. *Sycomorus* sect. *Sycocarpus*. Asymmetry in subg. *Synoecia* is linked to the juvenile (bathyphyll) state.

Subdivision — Two sections have been recognized: sect. *Sycidium* and sect. *Palaeomorphe*. They can be distinguished primarily by differences in growth habit, related to the ability to produce aerial adventitious roots, and secondarily by differences that vary to some extent, as in the state of the pistil in the staminate flower, in the position of the waxy glands, in the shape of the base of the lamina, and in the indumentum.

Subg. *Sycidium*
- Sect. *Sycidium*
  - *Ficus conocephalifolia*-group
  - *Ficus copiosa*-group
  - *Ficus heterophylla*-group
  - *Ficus montana*-group
  - *Ficus ulmifolia*-group
- Sect. *Palaeomorphe*
  - *Ficus subulata*-group
  - *Ficus tinctoria*-group

References: Corner, E.J.H., Taxonomic notes on Ficus Linn., Asia and Australasia. IV. Subgen. Ficus sect. Sycidium. Gard. Bull. Singapore 17 (1960) 442–485. — Corner, E.J.H., Check-list of Ficus in Asia and Australasia with keys to identification. Gard. Bull. Singapore 21 (1965) 1–186. — Wiebes, J.T., The Indo-Australian Agaoninae (pollinators of figs). Verh. Kon. Ned. Akad. Wet., afd. Natk., 2de reeks, 92 (1994) 1–208.

KEY TO THE SECTIONS

1a. Trees or shrubs without aerial adventious roots and with intermittent growth with the proximal internodes of branches long and the proximal ones (very) short; leafy twigs often hollow; waxy glands usually bilateral in the axils of the basal lateral veins (or on the midrib and then rarely fused); figs usually with internal hairs . . . . . Sect. **Sycidium**

b. Climbers or hemi-epiphytes (or sometimes free-standing treelets or shrubs) with aerial adventitious roots and without intermittent growth nor the internodes of branches clearly different in length; leafy twigs solid; waxy glands often unilateral in the axils of one of the basal lateral veins; figs often without internal hairs or these sparse and short . . . . . Sect. **Palaeomorphe**

KEY TO THE SPECIES

1a. Leaves spirally arranged or partly (sub)opposite, sometimes subverticillate . . 2
b. Leaves distichous 43
2a. Stipules (1–)1.5–4.5(–5) cm long 3
b. Stipules up to 1(–1.2) cm long 10
3a. Leafy twigs (sparsely) whitish hispidulous, (densely) whitish puberulous or hirtellous, or glabrous; stipules caducous (or only persistent in tufts at the apices of twigs) 4
b. Leafy twigs at least partly (dark) brown hirsute to hirtellous or strigose to strigillose; stipules mostly (sub)persistent 6
4a. Epidermis of the petiole persistent; fig receptacle longer than wide, 2–2.5 cm diam. when dry. — New Guinea . . . . . **28. F. primaria**
b. Epidermis of the petiole flaking off over the whole length or only at the basal and upper part; fig receptacle about as long as wide, or if longer than wide, then up to 2 cm diam. when dry 5
5a. Lateral veins (4–)6–10 pairs; petiole 1.5–3 mm thick, its epidermis flaking off at the basal and upper part. — Celebes, Moluccas, New Guinea . . **7. F. copiosa**
b. Lateral veins (8–)10–12 pairs; petiole (2–)3–5 mm thick, its epidermis flaking off over the whole length. — New Britain and New Ireland . . . **34. F. sciaphila**
6a. Lateral bracts of the fig receptacle 5–20 mm long, often numerous and largely or entirely concealing the receptacle 7
b. Lateral bracts of the fig receptacle to 5 mm long, several, few, or none 8
7a. Petiole (1.5–)4–15(–20) cm long; base of the lamina (sub)cordate. — New Guinea . . . . . **5. F. complexa**
b. Petiole 1–5.5 cm long; base of the lamina rounded. — New Guinea . . . . . **11. F. eustephana**
8a. Petiole 0.4–1(–1.5) cm long, slightly different to almost equal in length on the same twig. — Celebes . . . . . **31. F. riedelii**
b. Petiole 0.5–12(–30) cm long, distinctly different in length on the same twig . 9
9a. Basal lateral veins up to 1/4–1/3 the length of the lamina; fig receptacle 0.7–1.5 cm diam. when dry. — New Guinea . . . . . **27. F. porphyrochaete**
b. Basal lateral veins up to 1/3–1/2(–2/3) the length of the lamina; fig receptacle (1–)1.5–2(–3) cm diam. when dry. — New Guinea . . . . **6. F. conocephalifolia**
10a. Hairs (partly) uncinate. — Sumatra and Java . . . . . **2. F. asperiuscula**
b. Hairs straight, curved or ± crinkled 11
11a. Leafy twigs and lower surface of the lamina (at least partly) with (dark) brown hairs 12
b. Leafy twigs and lamina beneath with whitish hairs or indumentum absent . . 17
12a. Epidermis of the petiole persistent 13
b. Epidermis of the petiole flaking off 15
13a. Basal lateral veins up to 1/3–1/2 the length of the lamina; petiole 0.4–1(–1.5) cm long, slightly different to almost equal in length on the same twig. — Celebes . . . . . **31. F. riedelii**

b. Basal lateral veins up to 1/5–1/3 the length of the lamina; petiole (0.5–)1–8(–12) cm long, distinctly different in length on the same twig 14

14a. Waxy glands on the lamina absent; figs cauliflorous to flagelliflorous on leafy branches on the trunk or on up to 3 m long stolons. — New Guinea . . . . . **3. F. badiopurpurea**

b. Waxy glands on the lamina present, conspicuous, largely on the midrib; figs axil-lary to cauliflorous. — Borneo, Philippines, Celebes, Lesser Sunda Islands, Moluccas, New Guinea . . . . . **15. F. gul**

15a. Basal lateral veins up to 1/3–1/2 the length of the lamina; fig receptacle 1.3–1.8 cm diam. when dry, with numerous up to 15 mm long lateral bracts. — New Guinea . . . . . **11. F. eustephana**

b. Basal lateral veins up to 1/8–1/3 the length of the lamina; fig receptacle 0.4–0.8 (–1.2) cm diam. when dry, with few up to 3 mm long lateral bracts 16

16a. Waxy glands on the lamina absent; basal lateral veins up to 1/8–1/6 the length of the lamina and unbranched. — New Guinea . . . . . **26. F. phaeosyce**

b. Waxy glands on the lamina present, conspicuous, largely on the midrib; basal lateral veins up to 1/4(–1/3) the length of the lamina and mostly branched. — Borneo, Philippines, Celebes, Lesser Sunda Islands, Moluccas, New Guinea . . . . . **15. F. gul**

17a. Leafy twigs and laminas glabrous and (almost) smooth 18

b. Leafy twigs and laminas (densely or sparsely) hairy and/or scabrous to scabridulous 21

18a. Additional waxy glands present in the axils of other lateral veins than the basal ones; leaves distinctly spirally arranged. — Lesser Sunda Islands, Moluccas, New Guinea . . . . . **41. F. wassa**

b. Additional waxy glands absent; leaves arranged in lax spirals to distichous, rarely opposite 19

19a. Shrubs up to 3 m tall, often prostrate. — Malay Peninsula, Java, Borneo . . . . . **16. F. heterophylla**

b. Trees 20

20a. Apex of the lamina shortly and ± abruptly acuminate to rounded; margin of the lamina usually ± revolute. — Celebes . . . . . **38. F. tonsa**

b. Apex of the lamina (sub)acuminate to subacute; margin of the lamina flat. — New Guinea . . . . . **18. F. leptodictya**

21a. Basal lateral veins up to 1/3–1/2 the length of the lamina 22

b. Basal lateral veins up to 1/20–1/3 the length of the lamina 23

22a. Petiole 2–9 cm long, varying considerably in length on the same twig; peduncle 1–5 cm long, the ostiole surrounded by a low rim. — Philippines, Celebes, Moluccas . . . . . **17. F. heteropoda**

b. Petiole 0.5–3 cm long, varying slightly to almost equal in length on the same twig; peduncle 0.2–1.5 cm long, the ostiole surrounded by apical bracts, these as well as the narrow outer ostiolar bracts pointing upwards. — Philippines . . . . . **40. F. ulmifolia**

23a. Epidermis of the petiole flaking off over the whole length or only at the basal part or also at the upper part 24

b. Epidermis of the petiole persistent 31
24a. Waxy glands on the midrib and nearly fused. — New Guinea . . . . . **15. F. gul**
b. Waxy glands in the axils of the basal lateral veins 25
25a. Base of the lamina cordate to subcordate 26
b. Base of the lamina cuneate to rounded 27
26a. Stipules c. 0.5 cm long, subovate, chartaceous. — Java, Lesser Sunda Islands . . . . . **4. F. balica**
b. Stipules 0.5–2 cm long, almost subulate, coriaceous. — Celebes, Moluccas, New Guinea . . . . . **7. F. copiosa**
27a. Petiole 1–9.5 cm long, on the same twig usually considerably different in length (usually more than 1:2) 28
b. Petiole 0.5–2(–4.5) cm long, on the same twig slightly different in length (usually up to 1:2) or about equally long 29
28a. Stipules 0.5–2 cm long, almost subulate, coriaceous. — Celebes, Moluccas, New Guinea . . . . . **7. F. copiosa**
b. Stipules c. 0.5 cm long, subovate, chartaceous. — Flores . . . . **13. F. floresana**
29a. Stipules almost subulate and finely striate, often subpersistent (at least at the apices of leafy twigs); figs mostly ramiflorous to cauliflorous, in clusters. — Lesser Sunda Islands, Moluccas, New Guinea . . . . . **41. F. wassa**
b. Stipules subovate to lanceolate and chartaceous, not striate, caducous; figs axillary or just below the leaves, in pairs or solitary 30
30a. Figs sessile or with a peduncle up to 0.3 cm long. — N Borneo, Philippines, Celebes . . . . . **8. F. cumingii**
b. Figs with a peduncle 0.8–2.3 cm long. — Flores . . . . . **13. F. floresana**
31a. Waxy glands on, or largely on, the midrib; base of the lamina mostly cordate to subcordate 32
b. Waxy glands confined to the axils of the basal lateral veins; base of the lamina cuneate to rounded 33
32a. Fig receptacle longer than wide, 2–2.5 cm diam. when dry. — New Guinea . . . . . **28. F. primaria**
b. Fig receptacle subglobose, 0.3–1.2 cm diam. when dry. — Borneo, Philippines, Celebes, Lesser Sunda Islands, Moluccas, New Guinea . . . . . **15. F. gul**
33a. Leaves only spirally arranged 34
b. Leaves at least partly (sub)opposite or subverticillate 41
34a. Stipules almost subulate and finely striate, often subpersistent (at least at the apices of leafy twigs); figs mostly ramiflorous to cauliflorous, in clusters. — Lesser Sunda Islands, Moluccas, and New Guinea . . . . . **41. F. wassa**
b. Stipules subovate to lanceolate and chartaceous, not striate, caducous; figs axillary or just below the leaves, in pairs or solitary 35
35a. Basal lateral veins up to 1/10–1/20 the length of the lamina; lamina linear-lanceolate 36
b. Basal lateral veins up to 1/6–1/3 the length of the lamina; lamina oblong to elliptic 39
36a. Leafy twigs solid; lamina (sub)coriaceous; figs sessile or with a peduncle up to 0.3 cm long. — N Borneo, Philippines, Celebes . . . . . **8. F. cumingii**

b. Leafy twigs usually hollow; lamina chartaceous; figs usually with a peduncle 0.3–0.8 cm long 37

37a. Indumentum of leafy twig, petiole, and lamina beneath brownish; figs (sub)sessile, the receptacle 0.8–1.2 cm diam. when dry. — N Borneo . . **32. F. sandanakana**

b. Indumentum of leafy twig, petiole, and lamina beneath whitish (and sparse); figs with a distinct peduncle, (0.1–)0.2–0.8 cm long, the receptacle 0.5–0.8 cm diam. when dry 38

38a. Margin of the lamina coarsely crenate-dentate to subentire; ostiole c. 1 mm diam., surrounded by a sublobate rim; fruit (or endocarp body) distinctly tuberculate. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **22. F. montana**

b. Margin of the lamina closely denticulate; ostiole c. 2–3 mm diam., surrounded by a distinctly lobate rim; fruit (or endocarp body) smooth. — N Borneo . . . . . **36. F. subsidens**

39a. Indumentum of leafy twig, petiole, and lamina beneath brownish; figs (sub)sessile, the receptacle 0.8–1.2 cm diam. when dry. — N Borneo . . **32. F. sandanakana**

b. Indumentum of leafy twig, petiole, and lamina beneath whitish (and sparse); figs with a distinct peduncle, (0.1–)0.2–0.8 cm long, the receptacle 0.5–0.8 cm diam. when dry 40

40a. Margin of the lamina coarsely crenate-dentate to subentire; ostiole c. 1 mm diam., surrounded by a sublobate rim; fruit (or endocarp body) distinctly tuberculate. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **22. F. montana**

b. Margin of the lamina closely denticulate; ostiole c. 2–3 mm diam., surrounded by a distinctly lobate rim; fruit (or endocarp body) smooth. — N Borneo . . . . . **36. F. subsidens**

41a. Stipules almost subulate and finely striate, often subpersistent (at least at the apices of leafy twigs); figs mostly ramiflorous to cauliflorous, in clusters. — Lesser Sunda Islands, Moluccas, New Guinea . . . . . **41. F. wassa**

b. Stipules subovate to lanceolate and chartaceous, not striate, caducous; figs axillary or just below the leaves, in pairs or solitary 42

42a. Apex of lamina shortly acuminate to rounded; peduncle 0.2–1 cm long. — Java, New Guinea . . . . . **25. F. opposita**

b. Apex of lamina acuminate to subcaudate or to subacute; figs sessile or with a peduncle up to 0.3 cm long. — N Borneo, Philippines, Celebes **8. F. cumingii**

43a. Stipules fully amplexicaul, leaving annular scars (or only some of them semi-amplexicaul) 44

b. Stipules semi-amplexicaul to lateral, the scars not meeting opposite the base of the petiole 71

44a. Stipules (0.5–)1–2.8 cm long 45

b. Stipules 0.2–1(–1.3) cm long 53

45a. Stipules subpersistent, striate and aristate. — Borneo . . . . **64. F. rubromidotis**

b. Stipules caducous, or if subpersistent, then not striate or aristate 46

46a. Stipules finely striate; midrib of the lamina clearly prominent; figs cauliflorous on clusters of leafless branchlets with short internodes. — Borneo . . . . . **19. F. leptogramma**

b. Stipules not finely striate; midrib of the lamina slightly prominent to flat; figs axillary, just below the leaves, or sometimes ramiflorous 47
47a. Leafy twigs, petioles, and/or stipules hairy, often sparsely and/or minutely so 48
b. Leafy twigs, petioles, and stipules entirely glabrous 49
48a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins. — Widespread . . . . . **67. F. subulata**
b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins. — Widespread . . . . . **68. F. tinctoria**
49a. Basal lateral veins up to 1/3–1/2 the length of the lamina. — Celebes . . . . . **45. F. cauta**
b. Basal lateral veins up to 1/20–1/3 the length of the lamina 50
50a. Stipules dark brown when dry, base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins. — Widespread . . . . . **67. F. subulata**
b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins . 51
51a. Lamina lanceolate-linear. — Celebes . . . . . **46. F. celebensis**
b. Lamina elliptic to oblong 52
52a. Tertiary venation scalariform; apex of the lamina abruptly acuminate. — Philippines . . . . . **53. F. inaequifolia**
b. Tertiary venation reticulate to subscalariform, apex of the lamina ± gradually acuminate. — Borneo, Philippines, Celebes, Lesser Sunda Islands, Moluccas, New Guinea . . . . . **70. F. virgata**
53a. Epidermis of the petiole flaking off 54
b. Epidermis of the petiole persistent 63
54a. Apex of the lamina acuminate to subacute (to acute) or rounded 55
b. Apex of the lamina caudate to subcaudate 58
55a. Lamina chartaceous to subcoriaceous, margin bilaterally crenate-dentate to sublobate. — Celebes . . . . . **42. F. anastomosans**
b. Lamina coriaceous, margin entire or unilaterally sublobate 56
56a. Lamina with cystoliths (visible as minute pustules) only beneath; basal lateral veins mostly up to 1/3–1/2 the length of the lamina; lamina drying (dark) brown. — Widespread . . . . . **52. F. heteropleura**
b. Lamina with cystoliths (visible as minute pustules) on both sides; basal lateral veins up to 1/8–1/3 the length of the lamina; lamina drying greenish 57
57a. Leafy twigs and petioles entirely glabrous; epidermis of the petioles of the youngest leaves usually not yet flaking off. — Borneo, Philippines, Celebes, Lesser Sunda Islands, Moluccas, New Guinea . . . . . **70. F. virgata**
b. Leafy twigs and petioles minutely and sparsely hairy; epidermis of the petioles of the youngest leaves already flaking off. — Widespread . . . . . **68. F. tinctoria**

58a. Basal lateral veins up to 1/8–1/2; lateral veins long, (most of them) curved; lamina often longer than 10 cm; fig receptacle (0.3–)0.5–1 cm diam. when dry, the peduncle (0.1–)0.5–1.5 cm long. — Widespread ..... **52. F. heteropleura**
b. Basal lateral veins mostly up to 1/10–1/8 the length of the lamina, or if up to 1/4 the length, then the lateral veins short, running (almost) straight towards the margin, lamina shorter than 10 cm, fig receptacle 0.2–0.5 cm diam. when dry, and/or the peduncle 0.05–0.5 cm long 59
59a. Peduncle (usually) 0.2–0.5 cm long 60
b. Peduncle 0.05–0.2 cm long 61
60a. Lamina with cystoliths (visible as minute pustules) only beneath; figs axillary or just below the leaves. — New Guinea ..... **49. F. gracillima**
b. Lamina with cystoliths (visible as minute pustules) on both sides; figs flagelliflorous. — New Guinea ..... **48. F. funiculicaulis**
61a. Lower surface of the lamina hairy, although very sparsely. — Sumatra, Malay Peninsula, Java ..... **47. F. cuspidata**
b. Lower surface of the lamina entirely glabrous 62
62a. Basal lateral veins weakly developed, up to 1/10 the length of the lamina; base of the lamina not decurrent. — Borneo ..... **63. F. rubrocuspidata**
b. Basal lateral veins well-developed, up to 1/8–1/6 the length of the lamina; base of the lamina decurrent at one side. — Borneo ..... **57. F. leptocalama**
63a. Lamina strongly asymmetric and the lobe of the broad side of the lamina base often covering the petiole; 2 waxy glands in the axils of the basal lateral veins at the broad side of the lamina and only 1 in the axil of the main basal lateral veins at the narrow side. — Philippines, Celebes ..... **9. F. elmeri**
b. Lamina symmetric or ± strongly asymmetric, but then not a lobe of the lamina base covering the petiole, with 2 glands (one in each of the axils of the (major) basal lateral veins), 1 gland in the axil of one of the (major) basal lateral veins, or also additional glands in the axils of other lateral veins 64
64a. Basal lateral veins up to 1/2–2/3 the length of the lamina; tertiary venation largely perpendicular to the midrib. — Sumatra, Malay Peninsula, Java, Borneo, Philippines, Moluccas ..... **61. F. parietalis**
b. Basal lateral veins up to 1/10–1/2 the length of the lamina; not largely perpendicular to the midrib 65
65a. Basal lateral veins up to 1/4–1/2 the length of the lamina 66
b. Basal lateral veins up to 1/4 the length of the lamina 68
66a. Basal lateral veins running ± remotely from the margin of the lamina, branched; apex of the lamina shortly acuminate to rounded. — Widespread .... **21. F. melinocarpa**
b. Basal lateral veins running close to the margin of the lamina, unbranched; apex of the lamina acuminate to caudate 67
67a. Waxy glands 2, in the axils of both basal lateral veins; petiole 0.2–1 cm long; leafy twigs and petioles hairy, although minutely and/or sparsely. — Widespread ... . **1. F. ampelas**
b. Waxy gland 1, in the axil of one of the basal lateral veins; petiole (0.5–)1–2 cm long; leafy twigs and petiole entirely glabrous. — Celebes ..... **45. F. cauta**

68a. Lamina scabrous above. — New Guinea . . . . . **43. F. armitii**
b. Lamina smooth above 69
69a. Petiole sparsely and minutely hispidulous; figs also ramiflorous and commonly clustered. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **65. F. sinuata**
b. Petiole glabrous; figs axillary or just below the leaves and solitary or paired . 70
70a. Waxy glands 2 (in the axils of both basal lateral veins); fig receptacle 0.8–1.2 cm diam. when dry. — Celebes . . . . . **37. F. tenuicuspidata**
b. Waxy gland 1 (in the axil of one of the basal lateral veins); fig receptacle 0.3–0.8 cm diam. when dry. — Borneo, Philippines, Celebes, Lesser Sunda Islands, Moluccas, New Guinea . . . . . **70. F. virgata**
71a. Hairs (partly) uncinate. — Sumatra, Java . . . . . **2. F. asperiuscula**
b. Hairs straight, curved or ± crinkled 72
72a. Lamina strongly asymmetric and the lobe of the broad side of the lamina base often covering the petiole; 2 waxy glands in the axils of the basal lateral veins at the broad side of the lamina (or these glands extended to the midrib and then often fused) and only 1 in the axil of the main basal lateral veins at the narrow side; additional smaller waxy glands in the axils of other lateral veins present or not 73
b. Lamina symmetric or ± strongly asymmetric, but then not a lobe of the lamina base covering the petiole, with 2 glands (one in each of the axils of the (major) basal lateral veins), 1 gland in the axil of one of the (major) basal lateral veins, or also additional glands in the axils of other lateral veins 75
73a. Leafy twigs and petioles coarsely hispidulous, scabrous, the hairs with strongly swollen bases. — Philippines . . . . . **12. F. fiskei**
b. Leafy twigs and petioles puberulous to hirtellous or to subhispidulous, smooth (or scabridulous), the hairs without (strongly) swollen bases 74
74a. Additional waxy glands in the axils of other lateral veins than the basal ones present; fig receptacle 1–1.8 cm diam. when dry. — Philippines **24. F. odorata**
b. Additional waxy glands in the axils of other lateral veins than the basal ones absent; fig receptacle 0.7–1 cm diam. when dry. — New Guinea . . . . . **10. F. erinobotrya**
75a. Lamina 8–17 cm broad, the midrib prominent above, the basal lateral veins 1/5–1/4 the length of the lamina, the tertiary venation subscalariform to reticulate, the base not prominently inequilateral. — Borneo . . . . . **54. F. jaheriana**
b. Lamina (usually) less than 8 cm broad, if broader, then the midrib impressed above, the basal lateral veins 1/4–1/2 the length of the lamina, the tertiary venation distinctly scalariform and/or the base prominently inequilateral 76
76a. Stipules 1–2.3 cm long 77
b. Stipules 0.3–1(–1.2) cm long 85
77a. Stipules (sub)persistent 78
b. Stipules caducous 82
78a. Stipules not striate, with dense brown indumentum; base of the lamina at the broad side weakly auriculate or not 79
b. Stipules striate, with rather sparse and whitish or brownish indumentum or glabrous; base of the lamina at the broad side conspicuously auriculate, extended by an elliptic lobe with a midrib, or with a strip of mesophyll along the petiole . 80

79a. Lamina slightly asymmetric to almost symmetric; basal lateral veins up to 1/4–1/3 (–1/2) the length of the lamina; waxy gland only 1, in the axil of one of the basal lateral veins. — Sumatra . . . . . **56. F. lasiocarpa**
b. Lamina distinctly asymmetric; basal lateral veins up to 1/8–1/4 the length of the lamina; waxy glands in addition to the one in the axil of one of the basal lateral veins mostly present in axils of other lateral veins. — Sumatra, Java, Borneo, Philippines . . . . . **60. F. obscura**
80a. Epidermis of the petiole not flaking off. — Sumatra . . . . . **66. F. stipata**
b. Epidermis of the petiole (±) flaking off 81
81a. Base of the lamina at the broad side extended by an auricle; additional small waxy glands usually present in the axils of other lateral veins than the basal ones. — Borneo . . . . . **51. F. hemsleyana**
b. Base of the lamina at the broad side extended by an elliptic lobe, or in smaller leaves just with a strip of mesophyll along the petiole; additional glands absent. — Moluccas, New Guinea . . . . . **44. F. aurita**
82a. Base of the lamina at one side decurrent, with a distinct auricle, an elliptic lobe with a midrib, or a strip of mesophyll along the petiole and/or an auricle or lobe 83
b. Base of the lamina at one side not decurrent with a strip of mesophyll along the petiole 84
83a. Base of the lamina at the broad side auriculate; stipules not striate; small additional waxy glands in other than the basal lateral veins often present. — Borneo . . . . . **59. F. midotis**
b. Base of the lamina at the broad side extended by an elliptic lobe with a midrib or in smaller leaves with a strip of mesophyll along the petiole; stipules not striate; additional waxy glands absent. — Borneo, Philippines, Celebes, Moluccas, New Guinea . . . . . **44. F. aurita**
84a. Waxy glands 2, in the axils of both basal lateral veins; ostiole with a rosette of subulate apical bracts. — Celebes . . . . . **31. F. riedelii**
b. Waxy gland 1, in the axil of one of the basal lateral veins; ostiole with a rosette of apical bracts. — Sumatra . . . . . **56. F. lasiocarpa**
85a. Epidermis of the petiole flaking off 86
b. Epidermis of the petiole persistent 93
86a. Waxy glands 2, in the axils of both basal lateral veins; tertiary and smaller veins of the lamina ± prominent beneath 87
b. Waxy gland 1, in the axil of one of the basal lateral veins (or also smaller additional glands in the axils of other lateral veins than the basal ones); tertiary and smaller veins of the lamina flat or slightly prominent 88
87a. Indumentum of leafy twig and petiole yellowish or whitish; peduncle 0.1–0.3 cm long. — New Guinea . . . . . **20. F. macrorrhyncha**
b. Indumentum of leafy twig and petiole brown; peduncle 0.5–1.2 cm long. — Philippines . . . . . **52. F. heteropleura**
88a. Base of the lamina equilateral, not decurrent; additional waxy glands in the axils of other lateral veins than the basal ones absent. — Widespread . . . . . **52. F. heteropleura**

b. Base of the lamina inequilateral, at one side the base decurrent, or if slightly so, then additional waxy glands in the axils of other lateral veins than the basal ones usually present 89

89a. Petiole and lamina beneath entirely glabrous. — Sumatra, Malay Peninsula, Borneo, Philippines, Moluccas . . . . . **69. F. uniglandulosa**

b. Petiole and lamina beneath hairy, at least sparsely and minutely hispidulous (and then usually scabridulous) 90

90a. Peduncle 0.3–1(–2.5) cm long; additional waxy glands in other lateral veins than the basal ones usually present . . . . . **59. F. midotis**

b. Peduncle 0.1–0.3 cm long; additional waxy glands absent 91

91a. Indumentum brown(ish). — Borneo, Philippines, Celebes . . . . . **44. F. aurita**

b. Indumentum whitish (often sparse and minute) 92

92a. Additional waxy glands (in the axils of other lateral veins than the basal ones) absent; ostiole sunken; dried twigs changing in colour from dark red-brown to yellowish due to exfoliation of the periderm. — Sumatra, Malay Peninsula, Borneo, Philippines, Moluccas . . . . . **69. F. uniglandulosa**

b. Additional waxy glands (in the axils of other lateral veins than the basal ones) usually present; ostiole not sunken, surrounded by a low rim; younger and older parts of the twigs not or hardly different in colour. — Borneo . . . **59. F. midotis**

93a. Lamina glabrous and/or (almost) smooth above 94

b. Lamina ± scabrous above 105

94a. Leafy twigs, petiole and midrib of the lamina beneath densely yellowish hairy; waxy glands 2 (in the axils of both basal lateral veins); petiole 0.5–1.5 cm long; fig receptacle 0.5–0.7 cm diam. when dry. — New Guinea . . . . . **20. F. macrorrhyncha**

b. Leafy twigs sparsely hairy or glabrous, or if densely hairy, then the indumentum brown, the waxy gland 1 (in the axil of one of the basal lateral veins), the petiole 0.3–0.6 cm long, and the fig receptacle 0.3–0.5 cm diam. when dry 95

95a. Lamina lanceolate; lateral veins 11–16 pairs, departing at wide angles, up to 90°; basal lateral veins up to 1/20–1/10 the length of the lamina. — N Borneo, Philippines, Celebes . . . . . **8. F. cumingii**

b. Lamina elliptic to oblong to subobovate, or if lanceolate, then the lateral veins (3–)4–11 pairs and/or the basal lateral veins up to 1/6 the length of the lamina 96

96a. Stipules subpersistent, striate; basal lateral veins up to 1/3–1/2 the length of the lamina; waxy gland 1 (in the axil of one of the basal lateral veins). — Borneo . . . . . **55. F. kuchinensis**

b. Stipules caducous; basal lateral veins up to 1/8–1/4 the length of the lamina, or if up to 1/3–1/2 the length of the lamina, then waxy glands 2 (in the axils of both basal lateral veins) 97

97a. Leafy twig and petiole entirely glabrous or the petiole hairy only at the margins of the adaxial groove 98

b. Leafy twig and petiole hairy, often minutely and inconspicuously 103

98a. Basal lateral veins up to 1/3–1/2 the length of the lamina 99

b. Basal lateral veins up to 1/6–1/3 the length of the lamina 101

99a. Basal lateral veins branched at least at the broad side of the lamina. — New Guinea . . . . . **29. F. pseudowassa**
b. Basal lateral veins unbranched 100
100a. Tertiary venation regularly scalariform; apex of the lamina (sub)acuminate to subacute; margin of the lamina flat. — New Guinea . . . . . **18. F. leptodictya**
b. Tertiary venation loosely scalariform; apex of the lamina shortly and ± abruptly acuminate to rounded; margin of the lamina usually ± revolute. — Celebes . . . . . **39. F. tonsa**
101a. Peduncle 0.4–0.5 cm long; petiole hairy only at the margins of the adaxial groove of the petiole. — New Guinea . . . . . **23. F. myiopotamica**
b. Peduncle 0.5–1.2 cm long; petiole entirely glabrous 102
102a. Tertiary venation regularly scalariform; apex of the lamina (sub)acuminate to subacute; margin of the lamina flat. — New Guinea . . . . . **18. F. leptodictya**
b. Tertiary venation loosely scalariform; apex of the lamina shortly and ± abruptly acuminate to rounded; margin of the lamina usually ± revolute. — Celebes . . . . . **38. F. tonsa**
103a. Basal lateral veins branched at least at the broad side. — E New Guinea . . . . . **29. F. pseudowassa**
b. Basal lateral veins unbranched 104
104a. Lamina with cystoliths (visible as minute pustules) only beneath; fig receptacle 0.2–0.4 cm diam. when dry, sessile or with a peduncle up to 0.2 cm long. — Philippines . . . . . **58. F. microsphaera**
b. Lamina with cystoliths (visible as minute pustules) on both sides; fig receptacle 0.3–1(–1.5) cm diam. when dry; peduncle 0.2–1.2(–2.5) cm long. — Widespread . . . . . **1. F. ampelas**
105a. Waxy gland at the base of the midrib 106
b. Waxy glands in the axils of lateral veins, only the basal ones or also others 107
106a. Basal lateral veins of the lamina unbranched or faintly branched; figs axillary. — E New Guinea . . . . . **33. F. schumanniana**
b. Basal lateral veins at the broad side of the lamina branched; figs often also (far) below the leaves. — E New Guinea . . . . . **29. F. pseudowassa**
107a. Lamina obliquely rhombic; fig receptacle 1.5–2 cm diam. when dry. — Celebes . . . . . **14. F. goniophylla**
b. Lamina not rhombic; fig receptacle 0.3–1.3(–1.5) cm diam. when dry 108
108a. Waxy gland 1, in the axil of one of the basal lateral veins, or also additional ones in the axils of other lateral veins 109
b. Waxy glands 2, in the axils of both basal lateral veins 110
109a. Lamina smooth; waxy glands only in the axil of one of the basal lateral veins. — Sumatra, Java, Celebes, Moluccas . . . . . **50. F. grewiifolia**
b. Lamina scabrous, at least above; additional waxy glands mostly present in the axils of other lateral veins than the basal ones. — Sumatra, Malay Peninsula, Java, Borneo, Philippines, Celebes . . . . . **62. F. pisifera**
110a. Basal lateral veins up to 1/20–1/10 the length of the lamina; lamina linear-lanceolate. — N Borneo, Philippines, Celebes . . . . . **8. F. cumingii**
b. Basal lateral veins up to 1/6–1/2 the length of the lamina; lamina oblong to subovate 111

111a. Shrubs usually up to c. 3 m tall, prostrate and rooting on the stems, sometimes ± climbing (straggling); base of the lamina not decurrent at one side. — Malay Peninsula, Java, Borneo . . . . . **16. F. heterophylla**
b. Trees, or if shrubs, then not prostrate with rooting stems, or if climbing, then with the base of the lamina decurrent at one side 112
112a. Basal lateral veins up to 1/6–1/4 the length of the lamina 113
b. Basal lateral veins up to 1/4–1/2 the length of the lamina 115
113a. Lamina with cystoliths (visible as minute pustules) only beneath; base of the lamina at one side decurrent and auricled; petiole 0.2–0.6(–0.8) cm long; often lianescent and/or epiphytic. — New Guinea . . . . . **43. F. armitii**
b. Lamina with cystoliths (visible as minute pustules) on both sides; base of the lamina not decurrent or auricled; petiole 0.5–1.5(–2) cm long; always terrestrial trees 114
114a. Lamina with the smaller veins prominent beneath, the upper surface often ± bullate; fig receptacle 0.5–0.8 cm diam. when dry, scabrous. — Celebes, Moluccas, New Guinea . . . . . **39. F. trachypison**
b. Lamina with the smaller veins almost flat beneath, the upper surface not bullate; fig receptacle 0.9–1.2 cm diam. when dry, smooth. — E New Guinea . . . . . **29. F. pseudowassa**
115a. Tertiary and smaller veins prominent beneath; indumentum on the leafy twigs and lamina beneath usually dense and conspicuous 116
b. Tertiary and smaller veins flat or only slightly prominent beneath; indumentum of the leafy twigs and lamina beneath sparse and/or inconspicuous 118
116a. Waxy glands also in the axils of other lateral veins than the basal ones. — Celebes, Moluccas, New Guinea . . . . . **39. F. trachypison**
b. Waxy glands only in the axils of the basal lateral veins 117
117a. Basal lateral veins up to 1/3–1/2 the length of the lamina; lamina not bullate above; ostiole receptacle surrounded by a rosette of apical bracts pointing upwards. — Celebes . . . . . **31. F. riedelii**
b. Basal lateral veins up to 1/4–1/3(–1/2) the length of the lamina; lamina ± bullate above. — E New Guinea . . . . . **30. F. quercetorum**
118a. Petiole 0.2–1 cm long; base of the lamina slightly inequilateral and the lateral veins unbranched or faintly branched. — Widespread . . . . . **1. F. ampelas**
b. Petiole (0.5–)1–3 cm long and/or the base of the lamina usually distinctly inequilateral and the basal lateral veins at least at the broad side of the lamina distinctly branched 119
119a. Upper surface of the lamina glabrous; figs also ramiflorous and cauliflorous. — E New Guinea . . . . . **29. F. pseudowassa**
b. Upper surface of the lamina (sparsely) hispidulous; figs usually only axillary 120
120a. Peduncular bracts 0.5–1 mm long; ostiole surrounded by apical bracts, these and the narrow outer ostiolar bracts pointing upwards. — Philippines . . . . . **40. F. ulmifolia**
b. Peduncular bracts 1–2 mm long; ostiole surrounded by a low rim and the broad upper ostiolar bracts not pointing upwards. — E New Guinea . **35. F. stellaris**

REGIONAL KEY: MALAY PENINSULA

1a. Leaves spirally arranged or partly (sub)opposite 2
b. Leaved distichous 3
2a. Leaves spirally arranged; lamina symmetric to slightly asymmetric, often smooth above . . . . . **22. F. montana**
b. Leaves opposite; lamina ± strongly asymmetric, scabrous above . . . . . **16. F. heterophylla**
3a. Stipules fully amplexicaul, leaving annular scars (or only some of them semi-amplexicaul) 4
b. Stipules semi-amplexicaul to lateral, the scars not meeting opposite the base of the petiole 11
4a. Stipules (0.5–)1–2.8 cm long 5
b. Stipules 0.2–1(–1.3) cm long 6
5a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**
b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins . . . . . **68. F. tinctoria**
6a. Epidermis of the petiole flaking off 7
b. Epidermis of the petiole persistent 9
7a. Midrib of the lamina impressed above; basal lateral veins often 1/3–1/2 the length of the lamina . . . . . **52. F. heteropleura**
b. Midrib prominent of the lamina to flat above; basal lateral veins up to 1/8–1/3 the length of the lamina 8
8a. Lamina asymmetric; fig receptacle 0.5–1 cm diam. when dry . . . . . **68b. F. tinctoria** subsp. **gibbosa**
b. Lamina symmetric to slightly asymmetric; fig receptacle 0.2–0.3 cm. diam. when dry . . . . . **47. F. cuspidata**
9a. Lamina scabrous above . . . . . **16. F. heterophylla**
b. Lamina smooth above 10
10a. Basal lateral veins up to 1/2–2/3 the length of the lamina; tertiary venation largely perpendicular to the midrib . . . . . **61. F. parietalis**
b. Basal lateral veins up to 1/8–1/4 the length of the lamina; not largely perpendicular to the midrib . . . . . **65. F. sinuata**
11a. Epidermis of the petiole flaking off; lamina scabrous above . . . . **62. F. pisifera**
b. Epidermis of the petiole persistent; lamina smooth above 12
12a. Midrib of the lamina impressed above; peduncle usually 0.5–1.5 cm long . . . . . **52. F. heteropleura**
b. Midrib of the lamina prominent above; peduncle 1–0.3 cm long . . . . . **69. F. uniglandulosa**

REGIONAL KEY: SUMATRA

1a. Hairs (partly) uncinate . . . . . **2. F. asperiuscula**
b. Hairs straight, curved or ± crinkled 2
2a. Leaves spirally arranged . . . . . **22. F. montana**
b. Leaves distichous 3
3a. Stipules fully amplexicaul, leaving annular scars (or only some of them semi-amplexicaul) 4
b. Stipules semi-amplexicaul to lateral, the scars not meeting opposite the base of the petiole 12
4a. Stipules (0.5–)1–2.8 cm long 5
b. Stipules 0.2–1(–1.3) cm long 6
5a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**
b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins . . . . . **68. F. tinctoria**
6a. Epidermis of the petiole flaking off 7
b. Epidermis of the petiole persistent 9
7a. Midrib of the lamina impressed above; basal lateral veins often 1/3–1/2 the length of the lamina . . . . . **52. F. heteropleura**
b. Midrib prominent of the lamina to flat above; basal lateral veins up to 1/8–1/3 the length of the lamina 8
8a. Lamina asymmetric; fig receptacle 0.5–1 cm diam. when dry . . . . . **68b. F. tinctoria** subsp. **gibbosa**
b. Lamina symmetric to slightly asymmetric; fig receptacle 0.2–0.3 cm diam. when dry . . . . . **47. F. cuspidata**
9a. Basal lateral veins up to 1/2–2/3 the length of the lamina; tertiary venation largely perpendicular to the midrib . . . . . **61. F. parietalis**
b. Basal lateral veins up to 1/8–1/4 the length of the lamina; not largely perpendicular to the midrib 10
10a. Basal lateral veins up to 1/4 the length of the lamina; waxy glands mostly unilateral; lamina glabrous and smooth above . . . . . **65. F. sinuata**
b. Basal lateral veins up to 1/4–1/2 the length of the lamina; waxy glands bilateral; lamina often minutely hairy or also ± scabrous above 11
11a. Basal lateral veins running ± remotely from the margin of the lamina, branched; apex of the lamina shortly acuminate to rounded . . . . . **21. F. melinocarpa**
b. Basal lateral veins running close to the margin of the lamina, unbranched; apex of the lamina acuminate to caudate . . . . . **1. F. ampelas**
12a. Stipules 1–2.3 cm long 13
b. Stipules 0.3–1(–1.2) cm long 16
13a. Stipules caducous . . . . . **56. F. lasiocarpa**
b. Stipules (sub)persistent 14

14a. Lamina asymmetric, puberulous to hispidulous and often ± scabrous above . . . . . **60. F. obscura**
b. Lamina almost symmetric, glabrous and smooth above 15
15a. Basal lateral veins up to 1/4–1/3(–12) the length of the lamina; peduncle 0–1 cm long . . . . . **56. F. lasiocarpa**
b. Basal lateral veins up to 1/10–1/5 the length of the lamina; peduncle 1.2–2(–3) cm long . . . . . **66. F. stipata**
16a. Epidermis of the petiole flaking off 17
b. Epidermis of the petiole persistent 18
17a. Midrib of the lamina impressed above; peduncle usually 0.5–1.5 cm long . . . . . **52. F. heteropleura**
b. Midrib of the lamina prominent above; peduncle 1–0.3 cm long . . . . . **69. F. uniglandulosa**
18a. Waxy glands 2, in the axils of both basal lateral veins; . . . . . **1. F. ampelas**
b. Waxy gland 1, in the axil of one of the basal lateral veins, or also additional ones in the axils of other lateral veins 19
19a. Lamina smooth; waxy glands only in the axil of one of the basal lateral veins . . . . . **50. F. grewiifolia**
b. Lamina scabrous, at least above; additional waxy glands mostly present in the axils of other lateral veins than the basal ones . . . . . **62. F. pisifera**

REGIONAL KEY: JAVA

1a. Hairs (partly) uncinate . . . . . **2. F. asperiuscula**
b. Hairs straight, curved or ± crinkled 2
2a. Leaves spirally arranged or (partly) (sub)opposite, or sometimes subverticillate 3
b. Leaves distichous 8
3a. Leaves spirally arranged 4
b. Leaves partly opposite or subverticillate 7
4a. Petiole usually 3–7 cm long . . . . . **4. F. balica**
b. Petiole usually 0.5–3(–4) cm long 5
5a. Fig receptacle 0.5–0.8 cm diam. when dry; lamina often smooth above, sometimes scabridulous . . . . . **22. F. montana**
b. Fig receptacle 0.8–1.5 cm diam. when dry; lamina scabrous above 6
6a. Tertiary venation scalariform; waxy glands usually partly or entirely on the midrib . . . . . **25. F. opposita**
b. Tertiary venation subreticulate; waxy glands not partly on the midrib . . . . . **16. F. heterophylla**
7a. Tertiary venation scalariform; waxy glands usually partly or entirely on the midrib . . . . . **25. F. opposita**
b. Tertiary venation subreticulate; waxy glands not partly on the midrib . . . . . **16. F. heterophylla**
8a. Stipules fully amplexicaul, leaving annular scars (or only some of them semi-amplexicaul) 9
b. Stipules semi-amplexicaul to lateral, the scars not meeting opposite the base of the petiole 15

9a. Epidermis of the petiole flaking off 10
b. Epidermis of the petiole persistent 12
10a. Midrib of the lamina impressed above; basal lateral veins often 1/3–1/2 the length of the lamina . . . . . **52. F. heteropleura**
b. Midrib prominent of the lamina to flat above; basal lateral veins up to 1/8–1/3 the length of the lamina 11
11a. Lamina asymmetric; fig receptacle 0.5–1 cm diam. when dry . . . . . **68b. F. tinctoria** subsp. **gibbosa**
b. Lamina symmetric to slightly asymmetric; fig receptacle 0.2–0.3 cm diam. when dry . . . . . **47. F. cuspidata**
12a. Basal lateral veins up to 1/2–2/3 the length of the lamina; tertiary venation largely perpendicular to the midrib . . . . . **61. F. parietalis**
b. Basal lateral veins up to 1/8–1/4 the length of the lamina; not largely perpendicular to the midrib 13
13a. Basal lateral veins up to 1/4 the length of the lamina; waxy glands mostly unilateral; lamina glabrous and smooth above . . . . . **65. F. sinuata**
b. Basal lateral veins up to 1/4–1/2 the length of the lamina; waxy glands bilateral; lamina often minutely hairy or also ± scabrous above 14
14a. Basal lateral veins running ± remotely from the margin of the lamina, branched; apex of the lamina shortly acuminate to rounded . . . . . **21. F. melinocarpa**
b. Basal lateral veins running close to the margin of the lamina, unbranched; apex of the lamina acuminate to caudate . . . . . **1. F. ampelas**
15a. Epidermis of the petiole flaking off; midrib impressed above; lamina smooth and glabrous and smooth above . . . . . **52. F. heteropleura**
b. Epidermis of the petiole persistent; midrib prominent above and/or lamina at least minutely hairy and ± scabrous above 16
16a. Stipules 1–1.5 cm long, subpersistent; fig receptacle 0.6–1 cm diam. when dry . . . . . **60. F. obscura**
b. Stipules 0.3–1(–1.2) cm long, caducous or of subpersistent, then the fig receptacle 0.2–0.6 cm diam. when dry 17
17a. Waxy glands 2, in the axils of both basal lateral veins . . . . . **1. F. ampelas**
b. Waxy gland 1, in the axil of one of the basal lateral veins, or also additional ones in the axils of other lateral veins 18
18a. Lamina smooth; waxy glands only the axils of one of the basal lateral veins . . . . . **50. F. grewiifolia**
b. Lamina scabrous, at least above; additional waxy glands mostly present in the axils of other lateral veins than the basal ones . . . . . **62. F. pisifera**

REGIONAL KEY: LESSER SUNDA ISLANDS

1a. Leaves spirally arranged or partly (sub)opposite, sometimes subverticillate . . 2
b. Leaves distichous 5
2a. Leafy twigs and lower surface of the lamina (at least partly) with (dark) brown hairs . . . . . **15. F. gul**
b. Leafy twigs and lamina beneath with whitish hairs or indumentum absent . . . 3

3a. Stipules almost subulate and finely striate, often subpersistent, at least at the apices of leafy twigs . . . . . **41. F. wassa**
b. Stipules subovate to lanceolate and chartaceous, not striate, caducous 4
4a. Base of the lamina cordate to subcordate . . . . . **4. F. balica**
b. Base of the lamina cuneate to rounded . . . . . **13. F. floresana**
5a. Stipules up to 1(–1.2) cm long; lamina often shorter than 10 cm 6
b. Stipules usually 1–2(–2.7) cm long; lamina often longer than 2 cm 7
6a. Epidermis of the petiole persistent; waxy glands in the axils of both basal lateral veins . . . . . **1. F. ampelas**
b. Epidermis of the petiole flaking off; waxy glands usually only in the axil of one of the basal lateral veins (or if in both, then unequal in size) . . . . . **68b. F. tinctoria** subsp. **gibbosa**
7a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**
b. Stipules greenish to pale brown when dry; base of the lamina slightly or not unilaterally decurrent and the waxy glands, 1 (or 2), in the axils of the basal lateral veins 8
8a. Leafy twigs and petioles entirely glabrous; epidermis of the petioles of the youngest leaves usually not yet flaking off . . . . . **70. F. virgata**
b. Leafy twigs and petioles minutely and sparsely hairy; epidermis of the petioles of the youngest leaves already flaking off . . . . . **68b. F. tinctoria** subsp. **gibbosa**

REGIONAL KEY: BORNEO

1a. Leaves spirally arranged or partly (sub)opposite, sometimes subverticillate . . . 2
b. Leaves distichous 11
2a. Leafy twigs and lower surface of the lamina (at least partly) with (dark) brown hairs; figs pedunculate . . . . . **15. F. gul**
b. Leafy twigs and lamina beneath with whitish hairs, or if brownish, then the figs (sub)sessile 3
3a. Leaves at least partly (sub)opposite or subverticillate . . . . . **8. F. cumingii**
b. Leaves only spirally arranged 4
4a. Basal lateral veins up to 1/10–1/20 the length of the lamina; lamina linear-lanceolate 5
b. Basal lateral veins up to 1/6–1/3 the length of the lamina; lamina oblong to elliptic or to subobovate 8
5a. Leafy twigs solid; lamina (sub)coriaceous; figs sessile or with a peduncle up to 0.3 cm long . . . . . **8. F. cumingii**
b. Leafy twigs usually hollow; lamina chartaceous; figs usually with a peduncle 0.3–0.8 cm long 6
6a. Indumentum of leafy twig, petiole, and lamina beneath brownish; figs (sub)sessile, the receptacle 0.8–1.2 cm diam. when dry . . . . . **32. F. sandanakana**

b. Indumentum of leafy twig, petiole, and lamina beneath whitish (and sparse); figs with a distinct peduncle, (0.1–)0.2–0.8 cm long, the receptacle 0.5–0.8 cm diam. when dry 7
7a. Margin of the lamina coarsely crenate-dentate to subentire; ostiole c. 1 mm diam., surrounded sublobate rim; fruit (or endocarp body) distinctly tuberculate . . . . . **32. F. montana**
b. Margin of the lamina closely denticulate; ostiole 2–3 mm diam., surrounded a distinctly lobate rim; fruit (or endocarp body) smooth . . . . . **36. F. subsidens**
8a. Tertiary venation subreticulate . . . . . **16. F. heterophylla**
b. Tertiary venation clearly scalariform 9
9a. Indumentum of leafy twig, petiole, and lamina beneath brownish; figs (sub)sessile, the receptacle 0.8–1.2 cm diam. when dry . . . . . **32. F. sandanakana**
b. Indumentum of leafy twig, petiole, and lamina beneath whitish (and sparse); figs with a distinct peduncle, (0.1–)0.2–0.8 cm long, the receptacle 0.5–0.8 cm diam. when dry 10
10a. Margin of the lamina coarsely crenate-dentate to subentire; ostiole c. 1 mm diam., surrounded sublobate rim; fruit (or endocarp body) distinctly tuberculate . . . . . **22. F. montana**
b. Margin of the lamina closely denticulate; ostiole 2–3 mm diam., surrounded by a distinctly lobate rim; fruit (or endocarp body) smooth . . . . . **36. F. subsidens**
11a. Stipules fully amplexicaul, leaving annular scars (or only some of them semi-amplexicaul) 12
b. Stipules semi-amplexicaul to lateral, the scars not meeting opposite the base of the petiole 27
12a. Stipules (0.5–)1–2.8 cm long 13
b. Stipules 0.2–1(–1.3) cm long 17
13a. Stipules subpersistent, striate and aristate . . . . . **64. F. rubromidotis**
b. Stipules caducous, or if subpersistent, then not striate or aristate 14
14a. Stipules finely striate; midrib of the lamina clearly prominent; figs cauliflorous on clusters of leafless branchlets with short internodes . . . **19. F. leptogramma**
b. Stipules not finely striate; midrib of the lamina slightly prominent to flat; figs axillary, just below the leaves, or sometimes ramiflorous 15
15a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**
b. Stipules greenish to pale brown when dry; base of the lamina slightly or not unilaterally decurrent and the waxy glands, 1 (or 2), in the axils of the basal lateral veins 16
16a. Leafy twigs and petioles entirely glabrous; epidermis of the petioles of the youngest leaves usually not yet flaking off . . . . . **70. F. virgata**
b. Leafy twigs and petioles minutely and sparsely hairy; epidermis of the petioles of the youngest leaves already flaking off . . . . . **68b. F. tinctoria** subsp. **gibbosa**
17a. Epidermis of the petiole flaking off 18
b. Epidermis of the petiole persistent 23

18a. Apex of the lamina acuminate to subacute (to acute) or rounded 19
b. Apex of the lamina caudate to subcaudate 21
19a. Lamina with cystoliths (visible as minute pustules) only beneath; basal lateral veins mostly up to 1/3–1/2 the length of the lamina; lamina drying (dark) brown . . . . . **52. F. heteropleura**
b. Lamina with cystoliths (visible as minute pustules) on both sides; basal lateral veins up to 1/8–1/3 the length of the lamina; lamina drying greenish 20
20a. Leafy twigs and petioles entirely glabrous; epidermis of the petioles of the youngest leaves usually not yet flaking off . . . . . **70. F. virgata**
b. Leafy twigs and petioles minutely and sparsely hairy; epidermis of the petioles of the youngest leaves already flaking off . . . . . **68b. F. tinctoria** subsp. **gibbosa**
21a. Basal lateral veins up to 1/8–1/2; lateral veins long, (most of them) curved; lamina often longer than 10 cm; fig receptacle (0.3–)0.5–1 cm diam. when dry, the peduncle (0.1–)0.5–1.5 cm long . . . . . **52. F. heteropleura**
b. Basal lateral veins mostly up to 1/10–1/8 the length of the lamina, or if up to 1/5 the length, then the lateral veins short, running (almost) straight towards the margin, lamina shorter than 10 cm, fig receptacle 0.2–0.3 cm diam. when dry, and/or the peduncle 0–0.2 cm long 22
22a. Basal lateral veins weakly developed, up to 1/10 the length of the lamina; base of the lamina not decurrent . . . . . **63. F. rubrocuspidata**
b. Basal lateral veins well-developed, up to 1/8–1/6 the length of the lamina; base of the lamina decurrent at ones side . . . . . **57. F. leptocalama**
23a. Basal lateral veins up to 1/2–2/3 the length of the lamina; tertiary venation largely perpendicular to the midrib . . . . . **61. F. parietalis**
b. Basal lateral veins up to 1/10–1/2 the length of the lamina; not largely perpendicular to the midrib 24
24a. Basal lateral veins up to 1/4–1/2 the length of the lamina 25
b. Basal lateral veins up to 1/4 the length of the lamina 26
25a. Basal lateral veins running ± remotely from the margin of the lamina, branched; apex of the lamina shortly acuminate to rounded . . . . . **21. F. melinocarpa**
b. Basal lateral veins running close to the margin of the lamina, unbranched; apex of the lamina acuminate to caudate . . . . . **1. F. ampelas**
26a. Petiole sparsely and minutely hispidulous; figs also ramiflorous and commonly clustered . . . . . **65. F. sinuata**
b. Petiole glabrous; figs axillary or just below the leaves and solitary or paired . . . . . **70. F. virgata**
27a. Lamina 8–17 cm broad, the midrib prominent above, the basal lateral veins 1/5–1/4 the length of the lamina, the tertiary venation subscalariform to reticulate, the base not prominently inequilateral . . . . . **54. F. jaheriana**
b. Lamina (usually) less than 8 cm broad, if broader, than the midrib impressed above, the basal lateral veins 1/4–1/2 the length of the lamina, the tertiary venation distinctly scalariform and/or the base prominently inequilateral 28
28a. Stipules 1–2.3 cm long 29
b. Stipules 0.3–1(–1.2) cm long 30
29a. Epidermis of the petiole persistent; stipules not striate . . . . . **60. F. obscura**
b. Epidermis of the petiole ± flaking off; stipules striate . . . . . **51. F. hemsleyana**

30a. Epidermis of the petiole flaking off 31
b. Epidermis of the petiole persistent 39
31a. Stipules striate 32
b. Stipules not striate 33
32a. Basal lateral veins usually up to 1/10–1/6 the length of the lamina; peduncle 0.1–0.5 cm long . . . . . **44. F. aurita**
b. Basal lateral veins usually up to 1/4–1/3 the length of the lamina; peduncle (0.5–)1.5–2(–3) cm long . . . . . **51. F. hemsleyana**
33a. Waxy glands 2, in the axils of both basal lateral veins; tertiary and smaller veins of the lamina ± prominent beneath . . . . . **52. F. heteropleura**
b. Waxy gland 1, in the axil of one of the basal lateral veins (or also smaller additional glands in the axils of other lateral veins than the basal ones); tertiary and smaller veins of the lamina flat or slightly prominent 34
34a. Base of the lamina equilateral, not decurrent; additional waxy glands in the axils of other lateral veins than the basal ones absent . . . . . **52. F. heteropleura**
b. Base of the lamina inequilateral, at one side the base decurrent, or if slightly so, then additional waxy glands in the axils of other lateral veins than the basal ones usually present 35
35a. Petiole and lamina beneath entirely glabrous . . . . . **69. F. uniglandulosa**
b. Petiole and lamina beneath hairy, at least sparsely and minutely hispidulous (and then usually scabridulous) 36
36a. Peduncle 0.3–1(–2.5) cm long; additional waxy glands in other lateral veins than the basal ones usually present . . . . . **59. F. midotis**
b. Peduncle 0.1–0.3 cm long; additional waxy glands absent 37
37a. Indumentum brown(ish) . . . . . **44. F. aurita**
b. Indumentum whitish (often sparse and minute) 38
38a. Additional waxy glands (in the axils of other lateral veins than the basal ones) absent; ostiole sunken; dried twigs changing in colour from dark red-brown to yellowish due to exfoliation of the periderm . . . . . **69. F. uniglandulosa**
b. Additional waxy glands (in the axils of other lateral veins than the basal ones) usually present; ostiole not sunken, surrounded by a low rim; younger and older parts of the twigs not or hardly different in colour . . . . . **59. F. midotis**
39a. Lamina glabrous and/or (almost) smooth above 40
b. Lamina ± scabrous above 42
40a. Indumentum of leafy twigs and petiole brown and dense; midrib impressed above . . . . . **55. F. kuchinensis**
b. Indumentum of leafy twigs and petiole whitish, minute and/or sparse; midrib prominent to flat above 41
41a. Peduncle 0.2–1(–2.5) cm long; waxy glands in ± slit-shaped extensions of the axils of the basal lateral veins . . . . . **1. F. ampelas**
b. Peduncle 0–0.3 cm long; waxy glands not in extensions of the basal lateral veins . . . . . **8. F. cumingii**
42a. Waxy gland 1, in the axil of one of the basal lateral veins, or also additional ones in the axils of other lateral veins 43
b. Waxy glands 2, in the axils of both basal lateral veins 44

43a. Lamina smooth; waxy glands only in the axil of one of the basal lateral veins . . . . . **50. F. grewiifolia**
b. Lamina scabrous, at least above; additional waxy glands mostly present in the axils of other lateral veins than the basal ones . . . . . **62. F. pisifera**
44a. Shrub, partly with prostrate and rooting stems or branches, sometimes ± climbing (straggling) . . . . . **16. F. heterophylla**
b. Tree, treelet, of if a shrub, then with erect stems and branches 45
45a. Peduncle 0.2–1(–2.5) cm long; waxy glands in ± slit-shaped extensions of the axils of the basal lateral veins . . . . . **1. F. ampelas**
b. Peduncle 0–0.3 cm long; waxy glands not in extensions of the basal lateral veins . . . . . **8. F. cumingii**

REGIONAL KEY: PHILIPPINES

1a. Leaves spirally arranged or partly (sub)opposite, sometimes subverticillate . . 2
b. Leaves distichous 5
2a. Leafy twigs and lower surface of the lamina (at least partly) with (dark) brown hairs; waxy glands largely on the midrib . . . . . **15. F. gul**
b. Leafy twigs and lamina beneath with whitish hairs; waxy glands not on the midrib 3
3a. Petiole 2–9 cm long, varying considerably in length on the same twig; peduncle 1–5 cm long . . . . . **17. F. heteropoda**
b. Petiole 0.5–3 cm long, varying slightly to almost equal in length on the same twig; peduncle 0.2–1.5 cm long 4
4a. Ostiole surrounded by apical bracts, these as well as the narrow outer ostiolar bracts pointing upwards; basal lateral veins mostly running at some distance from the margin and then branched . . . . . **40. F. ulmifolia**
b. Ostiole not surrounded by apical bracts and outer ostiolar bracts not pointing upwards; basal lateral veins mostly running close to the margin and then unbranched (or in large leaves branched) . . . . . **8. F. cumingii**
5a. Stipules fully amplexicaul, leaving annular scars (or only some of them semi-amplexicaul) 6
b. Stipules semi-amplexicaul to lateral, the scars not meeting opposite the base of the petiole 18
6a. Stipules (0.5–)1–2.8 cm long 7
b. Stipules 0.2–1(–1.3) cm long 11
7a. Tertiary venation clearly scalariform 8
b. Tertiary venation reticulate to subscalariform 9
8a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**
b. Stipules greenish to pale brown when dry; base of the lamina slightly or not unilaterally decurrent and the waxy glands, 1 (or 2), in the axils of the basal lateral veins . . . . . **53. F. inaequifolia**

9a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**

b. Stipules greenish to pale brown when dry; base of the lamina slightly or not unilaterally decurrent and the waxy glands, 1 (or 2), in the axils of the basal lateral veins 10

10a. Leafy twigs and petioles entirely glabrous; epidermis of the petioles of the youngest leaves usually not yet flaking off . . . . . **70. F. virgata**

b. Leafy twigs and petioles minutely and sparsely hairy; epidermis of the petioles of the youngest leaves already flaking off . . . . . **68a. F. tinctoria** subsp. **tinctoria**

11a. Epidermis of the petiole flaking off 12

b. Epidermis of the petiole persistent 14

12a. Lamina with cystoliths (visible as minute pustules) only beneath; basal lateral veins mostly up to 1/3–1/2 the length of the lamina; lamina drying (dark) brown . . . . . **52. F. heteropleura**

b. Lamina with cystoliths (visible as minute pustules) on both sides; basal lateral veins up to 1/8–1/3 the length of the lamina; lamina drying greenish 13

13a. Leafy twigs and petioles entirely glabrous; epidermis of the petioles of the youngest leaves usually not yet flaking off . . . . . **70. F. virgata**

b. Leafy twigs and petioles minutely and sparsely hairy; epidermis of the petioles of the youngest leaves already flaking off . . . . . **68a. F. tinctoria** subsp. **tinctoria**

14a. Lamina strongly asymmetric and the lobe of the broad side of the lamina base often covering the petiole; 2 waxy glands in the axils of the basal lateral veins at the broad side of the lamina and only 1 in the axil of the main basal lateral veins at the narrow side . . . . . **9. F. elmeri**

b. Lamina symmetric or ± strongly asymmetric, but then not a lobe of the lamina base covering the petiole, with 2 glands (one in each of the axils of (the major) basal lateral veins), 1 gland in the axil of one of (the major) basal lateral veins, or also additional glands in the axils of other lateral veins 15

15a. Basal lateral veins up to 1/2–2/3 the length of the lamina; tertiary venation largely perpendicular to the midrib . . . . . **61. F. parietalis**

b. Basal lateral veins up to 1/10–1/2 the length of the lamina; not largely perpendicular to the midrib 16

16a. Basal lateral veins up to 1/4 the length of the lamina; waxy glands in the axil of one of the lateral veins . . . . . **70. F. virgata**

b. Basal lateral veins up to 1/4–1/2 the length of the lamina; waxy glands in the axils of both lateral veins 17

17a. Basal lateral veins running ± remotely from the margin of the lamina, branched; apex of the lamina shortly acuminate to rounded . . . . . **21. F. melinocarpa**

b. Basal lateral veins running close to the margin of the lamina, unbranched; apex of the lamina acuminate to caudate . . . . . **1. F. ampelas**

18a. Lamina strongly asymmetric and the lobe of the broad side of the lamina base often covering the petiole; 2 waxy glands in the axils of the basal lateral veins

at the broad side of the lamina (or these glands extended to the midrib and then often fused) and only 1 in the axil of the main basal lateral veins at the narrow side; additional smaller waxy glands in the axils of other lateral veins present or not 19

b. Lamina symmetric or ± strongly asymmetric, but then not a lobe of the lamina base covering the petiole, with 2 glands (one in each of the axils of (the major) basal lateral veins), 1 gland in the axil of one of (the major) basal lateral veins, or also additional glands in the axils of other lateral veins 20

19a. Leafy twigs and petioles coarsely hispidulous, scabrous, the hairs with strongly swollen bases . . . . . **12. F. fiskei**

b. Leafy twigs and petioles puberulous to hirtellous or to subhispidulous, smooth (or scabridulous), the hairs without (strongly) swollen bases . . . . . **24. F. odorata**

20a. Stipules 1–2.3 cm long . . . . . **60. F. obscura**

b. Stipules 0.3–1(–1.2) cm long 21

21a. Epidermis of the petiole flaking off 22

b. Epidermis of the petiole persistent 24

22a. Indumentum brown(ish); base of the lamina at the broad side extended by an elliptic lobe, or in smaller leaves just with a strip of mesophyll along the petiole; lateral veins usually 6–9 pairs . . . . . **44. F. aurita**

b. Indumentum whitish (often sparse and minute), base of the lamina not lobed, or if decurrent at one side, then the lateral veins usually 3–6 pairs 23

23a. Midrib impressed above; base of the lamina equilateral, not decurrent . . . . . **52. F. heteropleura**

b. Midrib prominent above; base of the lamina inequilateral, at one side the base decurrent . . . . . **69. F. uniglandulosa**

24a. Lamina glabrous and/or (almost) smooth above 25

b. Lamina ± scabrous above 27

25a. Lamina with cystoliths (visible as minute pustules) only beneath; fig receptacle 0.2–0.4 cm diam. when dry, the peduncle 0-0.2 cm long . **58. F. microsphaera**

b. Lamina with cystoliths (visible as minute pustules) on both sides; fig receptacle 0.5–1(–1.5) cm diam. when dry, or if 0.3–0.5 cm diam. when dry, then the peduncle 0.2–1.2(–2.5) cm long 26

26a. Peduncle 0.2–1(–2.5) cm long; waxy glands in ± slit-shaped extensions of the axils of the basal lateral veins . . . . . **1. F. ampelas**

b. Peduncle 0–0.3 cm long; waxy glands not in extensions of the basal lateral veins . . . . . **8. F. cumingii**

27a. Waxy gland 1, in the axil of one of the basal lateral veins, or also additional ones in the axils of other lateral veins . . . . . **62. F. pisifera**

b. Waxy glands 2, in the axils of both basal lateral veins 28

28a. Ostiole surrounded by apical bracts, these as well as the narrow outer ostiolar bracts pointing upwards; basal lateral veins mostly running at some distance from the margin and then branched . . . . . **40. F. ulmifolia**

b. Ostiole not surrounded by apical bracts and outer ostiolar bracts not pointing upwards; basal lateral veins running close to the margin and usually unbranched (or in large leaves branched) 29

29a. Peduncle 0.2–1(–2.5) cm long; waxy glands in ± slit-shaped extensions of the axils of the basal lateral veins . . . . . **1. F. ampelas**
b. Peduncle 0–0.3 cm long; waxy glands not in extensions of the basal lateral veins . . . . . **8. F. cumingii**

REGIONAL KEY: CELEBES

1a. Leaves spirally arranged or partly (sub)opposite, sometimes subverticillate . . 2
b. Leaves distichous 10
2a. Leafy twigs and lower surface of the lamina (at least partly) with (dark) brown hairs 3
b. Leafy twigs and lamina beneath with whitish hairs or indumentum absent . . . 4
3a. Basal lateral veins up to 1/3–1/2 the length of the lamina; petiole 0.4–1(–1.5) cm long, slightly different to almost equal in length on the same twig **31. F. riedelii**
b. Basal lateral veins up to 1/4(–1/3) the length of the lamina; petiole (0.5–)1–8(–12) cm long, distinctly different in length on the same twig . . . . . **15. F. gul**
4a. Epidermis of the petiole flaking off 5
b. Epidermis of the petiole persistent 7
5a. Stipules almost subulate, coriaceous, often tufted and subpersistent at the shoot apices . . . . . **7. F. copiosa**
b. Stipules subovate, chartaceous, not tufted and subpersistent at the shoot apices 6
6a. Waxy glands largely on the midrib; peduncle 0.5–1.5(–3) cm long . . **15. F. gul**
b. Waxy glands not on the midrib; peduncle 0–0.3 cm long . . . . . **8. F. cumingii**
7a. Leafy twigs and lamina glabrous . . . . . **38. F. tonsa**
b. Leafy twigs and lamina hairy, at least sparsely and/or minutely 8
8a. Basal lateral veins up to 1/3–1/2 the length of the lamina; peduncle 1–5 cm long; fig receptacle 0.8–1.5(–2) cm diam. when dry . . . . . **17. F. heteropoda**
b. Basal lateral veins up to (1/20–)1/4–1/3 the length of the lamina; peduncle up to 1 cm long, or if, longer then the fig receptacle usually up to 0.8 cm diam. when dry 9
9a. Waxy glands largely on the midrib; peduncle 0.5–1.5(–3) cm long . . **15. F. gul**
b. Waxy glands not on the midrib; peduncle 0–0.3 cm long . . . . . **8. F. cumingii**
10a. Stipules fully amplexicaul, leaving annular scars (or only some of them semi-amplexicaul) 11
b. Stipules semi-amplexicaul to lateral, the scars not meeting opposite the base of the petiole 26
11a. Stipules (0.5–)1–2.8 cm long 12
b. Stipules 0.2–1(–1.3) cm long 17
12a. Leafy twigs, petioles and/or stipules hairy, often sparsely and/or minutely so 13
b. Leafy twigs, petioles, and stipules entirely glabrous 14
13a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**

b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins . . . . . **68a. F. tinctoria** subsp. **tinctoria**

14a. Basal lateral veins up to 1/3–1/2 the length of the lamina . . . . . **45. F. cauta**

b. Basal lateral veins up to 1/20–1/3 the length of the lamina 15

15a. Stipules dark brown when dry, base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**

b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins . 16

16a. Lamina lanceolate-linear . . . . . **46. F. celebensis**

b. Lamina elliptic to oblong . . . . . **70. F. virgata**

17a. Epidermis of the petiole flaking off 18

b. Epidermis of the petiole persistent 21

18a. Lamina chartaceous to subcoriaceous, margin bilaterally crenate-dentate to sublobate . . . . . **42. F. anastomosans**

b. Lamina coriaceous, margin entire or unilaterally sublobate 19

19a. Lamina with cystoliths (visible as minute pustules) only beneath; basal lateral veins mostly up to 1/3–1/2 the length of the lamina; lamina drying (dark) brown . . . . . **52. F. heteropleura**

b. Lamina with cystoliths (visible as minute pustules) on both sides; basal lateral veins up to 1/8–1/3 the length of the lamina; lamina drying greenish 20

20a. Leafy twigs and petioles entirely glabrous; epidermis of the petioles of the youngest leaves usually not yet flaking off . . . . . **70. F. virgata**

b. Leafy twigs and petioles minutely and sparsely hairy; epidermis of the petioles of the youngest leaves already flaking off . . . . . **68a. F. tinctoria** subsp. **tinctoria**

21a. Lamina strongly asymmetric and the lobe of the broad side of the lamina base often covering the petiole; 2 waxy glands in the axils of the basal lateral veins at the broad side of the lamina and only 1 in the axil of the main basal lateral veins at the narrow side . . . . . **9. F. elmeri**

b. Lamina symmetric or ± strongly asymmetric, but then not a lobe of the lamina base covering the petiole, with 2 glands (one in each of the axils of (the major) basal lateral veins), 1 gland in the axil of one of (the major) basal lateral veins, or also additional glands in the axils of other lateral veins 22

22a. Basal lateral veins up to 1/4–1/2 the length of the lamina 23

b. Basal lateral veins up to 1/4 the length of the lamina 25

23a. Basal lateral veins running ± remotely from the margin of the lamina, branched; apex of the lamina shortly acuminate to rounded . . . . . **21. F. melinocarpa**

b. Basal lateral veins running close to the margin of the lamina, unbranched; apex of the lamina acuminate to caudate 24

24a. Waxy glands 2, in the axils of both basal lateral veins; petiole 0.2–1 cm long; leafy twigs and petioles hairy, although minutely and/or sparsely **1. F. ampelas**

b. Waxy gland 1, in the axil of one of the basal lateral veins; petiole (0.5–)1–2 cm long; leafy twigs and petioles entirely glabrous . . . . . **45. F. cauta**
25a. Waxy glands 2 (in the axils of both basal lateral veins); fig receptacle 0.8–1.2 cm diam. when dry . . . . . **37. F. tenuicuspidata**
b. Waxy gland 1 (in the axil of one of the basal lateral veins); fig receptacle 0.3–0.8 cm diam. when dry . . . . . **70. F. virgata**
26a. Epidermis of the petiole flaking off 27
b. Epidermis of the petiole persistent 28
27a. Midrib impressed above; base of the lamina at the broad side extended by an elliptic lobe, or in smaller leaves just with a strip of mesophyll along the petiole . . . . . **44. F. aurita**
b. Midrib prominent above; base of the lamina without lobe or extended strip of mesophyll . . . . . **52. F. heteropleura**
28a. Lamina glabrous and/or (almost) smooth above 29
b. Lamina ± scabrous above 31
29a. Lamina lanceolate; lateral veins 11–16 pairs, departing at wide angles, up to 90°; basal lateral veins up to 1/20–1/10 the length of the lamina . . . **8. F. cumingii**
b. Lamina elliptic to oblong to subobovate, or if lanceolate, then the lateral veins (3–)4–11 pairs and/or the basal lateral veins up to 1/6 the length of the lamina 30
30a. Leafy twigs and petioles glabrous . . . . . **38. F. tonsa**
b. Leafy twigs and petioles (densely or sparsely) hairy . . . . . **1. F. ampelas**
31a. Lamina obliquely rhombic; fig receptacle 1.5–2 cm diam. when dry . . . . . **14. F. goniophylla**
b. Lamina not rhombic; fig receptacle 0.3–1.3(–1.5) cm diam. when dry 32
32a. Waxy gland 1, in the axil of one of the basal lateral veins, or also additional ones in the axils of other lateral veins 33
b. Waxy glands 2, in the axils of both basal lateral veins 34
33a. Lamina smooth; waxy glands only in the axil of one of the basal lateral veins . . . . . **50. F. grewiifolia**
b. Lamina scabrous, at least above; additional waxy glands mostly present in the axils of other lateral veins than the basal ones . . . . . **62. F. pisifera**
34a. Basal lateral veins branched . . . . . **39. F. trachypison**
b. Basal lateral veins unbranched . . . . . **1. F. ampelas**

REGIONAL KEY: MOLUCCAS

1a. Leaves spirally arranged or partly (sub)opposite, sometimes subverticillate . . 2
b. Leaves distichous 5
2a. Stipules almost subulate, stiff, often subpersistent and in tufts at the shoot apices 3
b. Stipules, not stiff and not subpersistent at the shoot apices 4
3a. Stipules usually 1–2 cm long, base of the lamina usually (sub)cordate, petioles mostly longer than 4 cm . . . . . **7. F. copiosa**

b. Stipules usually 0.5–1 cm long, base of the lamina cuneate to rounded; petioles mostly up to 2.5 cm long . . . . . **41. F. wassa**

4a. Basal lateral veins op to 1/3–1/2 the length of the lamina; indumentum whitish; waxy glands not on the midrib . . . . . **17. F. heteropoda**

b. Basal lateral veins up to 1/4(–1/3) the length of the lamina; indumentum often at least partly brown; waxy glands largely on the midrib . . . . . **15. F. gul**

5a. Stipules fully amplexicaul, leaving annular scars (or only some of them semi-amplexicaul) 6

b. Stipules semi-amplexicaul to lateral, the scars not meeting opposite the base of the petiole 16

6a. Stipules (0.5–)1–2.8 cm long 7

b. Stipules 0.2–1(–1.3) cm long 10

7a. Leafy twigs, petioles and/or stipules hairy, often sparsely and/or minutely so 8

b. Leafy twigs, petioles, and stipules entirely glabrous 9

8a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**

b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins . . . . . **68a. F. tinctoria** subsp. **tinctoria**

9a. Stipules dark brown when dry, base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**

b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins . . . . . **70. F. virgata**

10a. Epidermis of the petiole flaking off 11

b. Epidermis of the petiole persistent 13

11a. Indumentum of leafy twig and petiole brownish; midrib impressed above . . . . . **52. F. heteropleura**

b. Indumentum of leafy twig and petiole whitish or absent; midrib slightly prominent to flat above 12

12a. Leafy twigs and petioles entirely glabrous; epidermis of the petioles of the youngest leaves usually not yet flaking off . . . . . **70. F. virgata**

b. Leafy twigs and petioles minutely and sparsely hairy; epidermis of the petioles of the youngest leaves already flaking off . . . . . **68a. F. tinctoria** subsp. **tinctoria**

13a. Basal lateral veins up to 1/2–2/3 the length of the lamina; tertiary venation largely perpendicular to the midrib . . . . . **61. F. parietalis**

b. Basal lateral veins up to 1/10–1/2 the length of the lamina; not largely perpendicular to the midrib 14

14a. Basal lateral veins running ± remotely from the margin of the lamina, branched; apex of the lamina shortly acuminate to rounded . . . . . **21. F. melinocarpa**

b. Basal lateral veins running close to the margin of the lamina, unbranched; apex of the lamina acuminate to caudate 15
15a. Waxy glands 2, in the axils of both basal lateral veins; leafy twigs and petioles hairy, although minutely and/or sparsely . . . . . **1. F. ampelas**
b. Waxy gland 1, in the axil of one of the basal lateral veins; leafy twigs and petioles entirely glabrous . . . . . **70. F. virgata**
16a. Epidermis of the petiole flaking off 17
b. Epidermis of the petiole persistent 20
17a. Base of the lamina at the broad side extended by an elliptic lobe, or in smaller leaves just with a strip of mesophyll along the petiole . . . . . **44. F. aurita**
b. Base of lamina at one side not with a lobe or decurrent with a strip of mesophyll along the petiole 18
18a. Midrib impressed above . . . . . **52. F. heteropleura**
b. Midrib ± prominent above 19
19a. Lamina hairy beneath mostly with brown indumentum . . . . . **44. F. aurita**
b. Lamina glabrous beneath or if hairy than sparsely and minutely . . . . . **69. F. uniglandulosa**
20a. Lamina glabrous and/or (almost) smooth above . . . . . **1. F. ampelas**
b. Lamina ± scabrous above 21
21a. Waxy gland 1, in the axil of one of the basal lateral veins, or also additional ones in the axils of other lateral veins . . . . . **50. F. grewiifolia**
b. Waxy glands 2, in the axils of both basal lateral veins 22
22a. Basal lateral veins branched . . . . . **39. F. trachypison**
b. Basal lateral veins unbranched . . . . . **1. F. ampelas**

REGIONAL KEY: NEW GUINEA

1a. Leaves spirally arranged or partly (sub)opposite, sometimes subverticillate . . 2
b. Leaves distichous 22
2a. Stipules (1–)1.5–4.5(–5) cm long 3
b. Stipules up to 1(–1.2) cm long 9
3a. Leafy twigs (sparsely) whitish hispidulous, (densely) whitish puberulous or hirtellous, or glabrous; stipules caducous (or only persistent in tufts at the apices of twigs) 4
b. Leafy twigs at least partly (dark) brown hirsute to hirtellous or strigose to strigillose; stipules mostly (sub)persistent 6
4a. Epidermis of the petiole persistent; fig receptacle longer than wide, 2–2.5 cm diam. when dry . . . . . **28. F. primaria**
b. Epidermis of the petiole flaking off over the whole length or only at the basal and upper part; fig receptacle about as long as wide, or if longer than wide, then up to 2 cm diam. when dry 5
5a. Lateral veins (4–)6–10 pairs; petiole 1.5–3 mm thick, its epidermis flaking off at the basal and upper part . . . . . **7. F. copiosa**
b. Lateral veins (8–)10–12 pairs; petiole (2–)3–5 mm thick, its epidermis flaking off over the whole length . . . . . **34. F. sciaphila**

6a. Lateral bracts of the fig receptacle 5–20 mm long, often numerous and largely or entirely concealing the receptacle 7
b. Lateral bracts of the fig receptacle to 5 mm long, several, few, or none 8
7a. Petiole (1.5–)4–15(–20) cm long; base of the lamina (sub)cordate . . . . . **5. F. complexa**
b. Petiole 1–5.5 cm long; base of the lamina rounded . . . . . **11. F. eustephana**
8a. Basal lateral veins up to 1/4–1/3 the length of the lamina; fig receptacle 0.7–1.5 cm diam. when dry . . . . . **27. F. porphyrochaete**
b. Basal lateral veins up to 1/3–1/2(–2/3) the length of the lamina; fig receptacle (1–)1.5–2(–3) cm diam. when dry . . . . . **6. F. conocephalifolia**
9a. Leafy twigs and lower surface of the lamina (at least partly) with (dark) brown hairs 10
b. Leafy twigs and lamina beneath with whitish hairs or indumentum absent . . 14
10a. Epidermis of the petiole persistent 11
b. Epidermis of the petiole flaking off 12
11a. Waxy glands on the lamina absent; figs cauliflorous to flagelliflorous on leafy branches on the trunk or on up to 3 m long stolons . . . . . **3. F. badiopurpurea**
b. Waxy glands on the lamina present, conspicuous, largely on the midrib; figs axillary to cauliflorous . . . . . **15. F. gul**
12a. Basal lateral veins up to 1/3–1/2 the length of the lamina; fig receptacle 1.3–1.8 cm diam. when dry, with numerous up to 15 mm long lateral bracts . . . . . **11. F. eustephana**
b. Basal lateral veins up to 1/8–1/3 the length of the lamina; fig receptacle 0.4–0.8 (–1.2) cm diam. when dry, with few up to 3 mm long lateral bracts 13
13a. Waxy glands on the lamina absent; basal lateral veins up to 1/8–1/6 the length of the lamina and unbranched . . . . . **26. F. phaeosyce**
b. Waxy glands on the lamina present, conspicuous, largely on the midrib; basal lateral veins up to 1/4(–1/3) the length of the lamina and mostly branched . . . . . **15. F. gul**
14a. Leafy twigs and laminas glabrous and (almost) smooth 15
b. Leafy twigs and laminas (densely or sparsely) hairy and/or scabrous to scabridulous 16
15a. Stipules 0.5–1 cm long, almost subulate, stiff, often subpersistent in tufts at the shoot apices; fig receptacle usually with (few) lateral bracts . . . . . **41. F. wassa**
b. Stipules 0.3–0.4 cm long, not almost subulate, stiff, and subpersistent; fig receptacle without lateral bracts . . . . . **18. F. leptodictya**
16a. Epidermis of the petiole flaking off over the whole length or only at the basal part or also at the upper part 17
b. Epidermis of the petiole persistent 19
17a. Waxy glands on the midrib and nearly fused . . . . . **15. F. gul**
b. Waxy glands in the axils of the basal lateral veins 18
18a. Stipules usually 1–2 cm long, base of the lamina usually (sub)cordate, petioles mostly longer than 4 cm . . . . . **7. F. copiosa**
b. Stipules usually 0.5–1 cm long, base of the lamina cuneate to rounded; petioles mostly up to 2.5 cm long . . . . . **41. F. wassa**

19a. Waxy glands on or largely on the midrib; base of the lamina mostly cordate to subcordate 20
b. Waxy glands confined to the axils of the basal lateral veins; base of the lamina cuneate to rounded 21
20a. Fig receptacle longer than wide, 2–2.5 cm diam. when dry . . . **28. F. primaria**
b. Fig receptacle subglobose, 0.3–1.2 cm diam. when dry . . . . . **15. F. gul**
21a. Stipules 0.5–1 cm long, almost subulate, stiff, often subpersistent in tufts at the shoot apices; fig receptacle usually with (few) lateral bracts . . . . . **41. F. wassa**
b. Stipules 0.3–0.5(–0.8) cm long, not almost subulate, stiff, and subpersistent; fig receptacle usually without lateral bracts . . . . . **25. F. opposita**
22a. Stipules fully amplexicaul, leaving annular scars (or only some of them semi-amplexicaul) 23
b. Stipules semi-amplexicaul to lateral, the scars not meeting opposite the base of the petiole 34
23a. Stipules (0.5–)1–2.8 cm long 24
b. Stipules 0.2–1(–1.3) cm long 27
24a. Leafy twigs, petioles and/or stipules hairy, often sparsely and/or minutely so 25
b. Leafy twigs, petioles, and stipules entirely glabrous 26
25a. Stipules dark brown when dry; base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**
b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins . . . . . **68a. F. tinctoria** subsp. **tinctoria**
26a. Stipules dark brown when dry, base of the lamina ± distinctly inequilateral and one side ± clearly decurrent and often slightly to clearly (minutely) auricled; often additional waxy glands in the axils of the 2nd to 4th pairs of lateral veins or the single waxy gland in such positions and not in the axils of the basal lateral veins . . . . . **67. F. subulata**
b. Stipules greenish to pale brown when dry; base of the lamina hardly unilaterally decurrent and the waxy glands, 1 or 2, in the axils of the basal lateral veins . . . . . **70. F. virgata**
27a. Basal lateral veins usually up to 1/4–1/2 the length of the lamina 28
b. Basal lateral veins usually up to 1/10–1/4 the length of the lamina 30
28a. Epidermis of petiole flaking off . . . . . **68a. F. tinctoria** subsp. **tinctoria**
b. Epidermis of petiole persistent 29
29a. Basal lateral veins running ± remotely from the margin of the lamina, branched; apex of the lamina shortly acuminate to rounded . . . . . **21. F. melinocarpa**
b. Basal lateral veins running close to the margin of the lamina, unbranched; apex of the lamina acuminate to caudate . . . . . **1. F. ampelas**
30a. Lamina scabrous above . . . . . **43. F. armitii**
b. Lamina smooth above 31
31a. Figs flagelliferous, fig receptacle 0.2–0.3 cm diam. when dry . . . . . **48. F. funiculicaulis**

b. Figs axillary or just below the leaves, sometimes ramiflorous; fig receptacle 0.3–1.5 cm diam. when dry 32

32a. Lamina with cystoliths (visible as minute pustules) only beneath; basal lateral veins 1/10–1/8 the length of the lamina; lamina and stipules drying brownish . . . . . **49. F. gracillima**

b. Lamina with cystoliths (visible as minute pustules) on both sides; basal lateral veins up to 1/8–1/4 the length of the lamina; lamina and stipules drying greenish 33

33a. Leafy twigs and petioles entirely glabrous; epidermis of the petioles of the youngest leaves usually not yet flaking off . . . . . **70. F. virgata**

b. Leafy twigs and petioles minutely and sparsely hairy; epidermis of the petioles of the youngest leaves already flaking off . . . . . **68a. F. tinctoria** subsp. **tinctoria**

34a. Lamina strongly asymmetric and the lobe of the broad side of the lamina base often covering the petiole; 2 waxy glands in the axils of the basal lateral veins at the broad side of the lamina (or these glands extended to the midrib and then often fused) and only 1 in the axil of the main basal lateral veins at the narrow side; additional smaller waxy glands in the axils of other lateral veins present or not . . . . . **10. F. erinobotrya**

b. Lamina symmetric or ± strongly asymmetric, but then not a lobe of the lamina base covering the petiole, with 2 glands (one in each of the axils of (the major) basal lateral veins), 1 gland in the axil of one of (the major) basal lateral veins, or also additional glands in the axils of other lateral veins 35

35a. Stipules usually 1–2.3 cm long and subpersistent; decurrent base of the lamina extended by a to 1.5 cm long lobe . . . . . **44. F. aurita**

b. Stipules usually up to 1 cm long and/or caducous; base of the lamina different 36

36a. Epidermis of the petiole flaking off . . . . . **20. F. macrorrhyncha**

b. Epidermis of the petiole persistent 37

37a. Lamina glabrous and/or (almost) smooth above 38

b. Lamina ± scabrous above 43

38a. Leafy twig and petiole entirely glabrous or the petiole hairy only at the margins of the adaxial groove 39

b. Leafy twig and petiole hairy, often minutely and inconspicuously 42

39a. Basal lateral veins up to 1/3–1/2 the length of the lamina 40

b. Basal lateral veins up to 1/6–1/3 the length of the lamina 41

40a. Basal lateral veins unbranched . . . . . **18. F. leptodictya**

b. Basal lateral veins branched at least at the broad side of the lamina . . . . . **29. F. pseudowassa**

41a. Peduncle 0.4–0.5 cm long; base of the lamina rounded to subcordate; petiole hairy at the margins of the adaxial groove; basal lateral veins distinctly branched . . . . . **23. F. myiopotamica**

b. Peduncle 0.5–1.2 cm long; petiole entirely glabrous; base of the lamina usually cuneate to obtuse; basal lateral veins unbranched or faintly branched . . . . . **18. F. leptodictya**

42a. Lamina mostly 4–10 cm long; basal lateral veins running close to the margin of the lamina, unbranched; fig receptacle hispidulous, scabrous to scabridulous . . . . . **1. F. ampelas**
b. Lamina mostly 10–22 cm long; basal lateral veins, at least at the broad side of the lamina often branched; fig receptacle glabrous and smooth **29. F. pseudowassa**
43a. Waxy gland at the base of the midrib 44
b. Waxy glands in the axils of lateral veins, only the basal ones or also others . 45
44a. Basal lateral veins of the lamina unbranched or faintly branched; figs axillary . . . . . **33. F. schumanniana**
b. Basal lateral veins at the broad side of the lamina branched; figs often also (far) below the leaves . . . . . **29. F. pseudowassa**
45a. Basal lateral veins up to 1/6–1/4 the length of the lamina 46
b. Basal lateral veins up to 1/4–1/2 the length of the lamina 48
46a. Lamina with cystoliths (visible as minute pustules) only beneath; base of the lamina at one side decurrent and auricled; petiole 0.2–0.6(–0.8) cm long; plants often lianescent and/or epiphytic . . . . . **43. F. armitii**
b. Lamina with cystoliths (visible as minute pustules) on both sides; base of the lamina not decurrent or auricled; petiole 0.5–1.5(–2) cm long; plants always terrestrial trees 47
47a. Lamina with the smaller veins prominent beneath, the upper surface often ± bullate; fig receptacle 0.5–0.8 cm diam. when dry, scabrous . . **39. F. trachypison**
b. Lamina with the smaller veins almost flat beneath, the upper surface not bullate; fig receptacle 0.9–1.2 cm diam. when dry, smooth . . . . . **29. F. pseudowassa**
48a. Tertiary and smaller veins prominent beneath; indumentum on the leafy twigs and lamina beneath usually dense and conspicuous 49
b. Tertiary and smaller veins flat or only slightly prominent beneath; indumentum of the leafy twigs and lamina beneath sparse and/or inconspicuous 50
49a. Waxy glands also in the axils of other lateral veins than the basal ones . . . . . **39. F. trachypison**
b. Waxy glands only in the axils of the basal lateral veins . . . **30. F. quercetorum**
50a. Petiole 0.2–1 cm long; base of the lamina slightly inequilateral and the lateral veins unbranched or faintly branched . . . . . **1. F. ampelas**
b. Petiole (0.7–)1–1.5(–2) cm long and/or the base of the lamina usually distinctly inequilateral and the basal lateral veins at least at the broad side of the lamina distinctly branched 51
51a. Upper surface of the lamina glabrous; figs also ramiflorous and cauliflorous . . . . . **29. F. pseudowassa**
b. Upper surface of the lamina (sparsely) hispidulous; figs usually only axillary . . . . . **35. F. stellaris**

Section Sycidium

Ficus L. subg. *Sycidium* (Miq.) Mildbr. & Burret sect. *Sycidium* Miq., London J. Bot. 7 (1848) 228. — *Ficus* L. subg. *Sycidium* (Miq.) Mildbr. & Burret sect. *Sycidium* Miq. subsect. *Sycidium* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 444.
Necalistis Raf., Sylv. Tellur. (1838) 58.

Ficus L. sect. *Carica* Miq. subsect. *Varinga* Miq., Ann. Sci. Nat. Bot., Sér. 3, 1 (1844) 33 (sub sect. *Carica*); Corner, Gard. Bull. Singapore 17 (1960) 446, sect. *Varinga* Miq. emend. Kuntze in Post & Kuntze, Lex. Gen. Phan. (1904) 236, ex parte. — *Ficus* L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Varinga* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 446.

Ficus L. subg. *Palaeomorphe* (King) Sata (as *Palaeomorphoe*) sect. *Palaeomorphe* King subsect. *Scabrifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 217, 221, 378; Corner, Gard. Bull. Singapore 21 (1905) 77.

Ficus L. subg. *Palaeomorphe* (King) Sata sect. *Palaeomorphe* King subsect. *Scabrifoliae* Sata ser. *Nonminutiliflorae* Sata subser. *Fulvobrunneifoliae* Sata (as *Fulvo-brunneusifoliae*), Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 217, 221, 378.

Ficus L. subg. *Palaeomorphe* (King) Sata sect. *Palaeomorphe* King subsect. *Scabrifoliae* Sata ser. *Nonminutiliflorae* Sata subser. *Metallicusiifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 217, 221, 378.

Ficus L. subg. *Eumetamorphae* Sata sect. *Sycidium* Miq. subsect. *Sycidium* (Miq.) Corner ser. *Linearifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 253, 254, 380.

Ficus L. subg. *Eumetamorphae* Sata sect. *Sycidium* Miq. subsect. *Sycidium* (Miq.) Corner ser. *Viridifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 253, 254, 380.

Ficus L. subg. *Eumetamorphae* Sata sect. *Sycidium* Miq. subsect. *Pseudosycidium* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 253, 258, 381.

Ficus L. subg. *Eumetamorphae* Sata sect. *Sycidium* Miq. subsect. *Pseudosycidium* Sata ser. *Scabricordatogibbosiifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 253, 258, 381.

Ficus L. subg. *Eumetamorphae* Sata sect. *Sycidium* Miq. subsect. *Pseudosycidium* Sata ser. *Lanceifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 253, 260, 381.

Ficus L. subg. *Eumetamorphae* Sata sect. *Sycidium* Miq. subsect. *Pseudosycidium* Sata ser. *Subscabririgidiifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 253, 262, 382.

Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Ficus* ser. *Sinosyceae* Corner, Gard. Bull. Singapore 17 (1960) 418.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Sycidium* (Miq.) Corner ser. *Copiosae* Corner, Gard. Bull. Singapore 17 (1960) 445.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Sycidium* (Miq.) Corner ser. *Phaeopilosae* Corner, Gard. Bull. Singapore 17 (1960) 445.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Sycidium* (Miq.) Corner ser. *Scabrae* Miq., London J. Bot. 7 (1848) 228; Corner, Gard. Bull. Singapore 17 (1960) 445.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Varinga* (Miq.) Corner ser. *Cyrtophylleae* Corner, Gard. Bull. Singapore 17 (1960) 446.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Varinga* (Miq.) Corner ser. *Exasperatae* Corner, Gard. Bull. Singapore 17 (1960) 446.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Varinga* (Miq.) Corner ser. *Heterophylleae* Corner, Gard. Bull. Singapore 17 (1960) 446.

Ficus L. subg. *Ficus* sect. *Synosycidium* Corner, Gard. Bull. Singapore 18 (1960) 24.

Trees or shrubs, terrestrial, commonly with intermittent growth; aerial adventitious roots absent. *Leafy twigs* hollow or, if solid, then with ample pith, (sub)terete and mostly ribbed; hairs often with a swollen base and the longer brown ones often clustered. *Leaves* spirally arranged, (sub)opposite (or subverticillate) or distichous, asymmetric to symmetric, often scabrous by rigid hairs or cystolith hairs; cystoliths mostly on both sides, less frequently only beneath; waxy glands in the axils of both lateral veins, sometimes largely on the midrib and then separate or fused, or sometimes absent, rarely 1 in the axils of one of the basal lateral veins, smaller glands may occur in the axils of other lateral veins; petiole long (and then often varying in length on the same leafy twig) or short (and almost equally long on the same leafy twig); stipules semi-

amplexicaul to lateral, less commonly fully amplexicaul. *Figs* axillary, ramiflorous, cauliflorous, rarely flagelliflorous; fig receptacle varying from c. 0.3 to c. 2.5 cm diam. when dry, lateral bracts often present; internal hairs mostly present (abundant to few), less frequently absent; tepals red to whitish, glabrous or hairy (mostly minutely so at the apices). *Staminate flowers* with small pistillodes. *Style* sometimes hairy. *Fruits* achenes, smooth, weakly tuberculate or finely punctate, mostly ± distinctly keeled or drupelets with tuberculate endocarp bodies (pyrenes).

Distribution — The section comprises c. 80 species and ranges from Samoa and Australia to Taiwan, Japan, and S China westwards to Réunion, Madagascar, and Africa (westwards to Senegal); in Malesia 42 species.

Delimitation — This section is distinct from sect. *Palaeomorphe* in the absence of adventitious roots, intermittent growth, hollow or solid but much pith containing leafy twigs, the arrangement of leaves spirally, (sub)opposite or subverticillate, absence of unilaterally decurrent base of the lamina, waxy glands at both sides of the midrib, and always small pistillodes in the staminate flowers.

Subdivision — Several groups of evidently or presumably related species can be recognized, but none with clear demarcations. The five (practical and informal) groups of species which can be distinguished are:

a. *Ficus conocephalifolia*-group (largely ser. *Phaeopilosae* Corner (1960)). — This group shows more or less clearly the features of intermittent growth as listed above. The group is characterized by stiff, bristle-like, often dark brown to almost black hairs. On the twigs, petioles and lamina, these hairs are not evenly distributed, but occur more or less clustered. The brown setose hairs are also found on the fig receptacle and have there a slightly swollen base, from which the hairs easily break off and then become irritant. In *F. gul*, these characteristic hairs can be (partly) replaced by whitish ones as is common in the *F. copiosa*-group. Relatively large lenticels occur just below the (scars of the) stipules. The leaves are spirally arranged. They vary from large to small, the large ones having longer petioles (up to 1/2 the length of the lamina) and also showing stronger differences in length of the petiole on the same twig than those with small leaves. The figs are axillary, ramiflorous, cauliflorous, or even flagelliflorous (in *F. badiopurpurea*). The receptacles vary from large to small, all are provided with lateral bracts, in some species (*F. complexa* and *F. eustaphana*) large ones. The ostiole is surrounded by a rosette of apical bracts, usually pointing upwards. The glabrous tepals are red, free or slightly so, or in *F. badiopurpurea* distinctly connate. The fruits are smooth and weakly to distinctly keeled. The group appears to be a natural one and comprises at least seven species: *F. badiopurpurea*, *F. complexa*, *F. conocephalifolia*, *F. eustephana*, *F. gul*, *F. phaeosyce*, and *F. porphyrochaete*. The group is centred in eastern New Guinea. *Ficus complexa* is also found in the western part of the island. *Ficus gul* is the only widespread species, extending to the Solomon Islands and westwards to the Philippines, Borneo, and the Lesser Sunda Islands. Most species are components of lowland forest, two species of montane forest. Several traits, as the presence of large leaves, relatively large figs, large stipules, and large lateral bracts on the fig receptacle appear to indicate that this group is

the most primitive one in the subgenus. Moreover, because of the dark brown indumentum, members of this group have been linked up (or confused) with sect. '*Bosscheria*' and with members of the *F. pachyrrhachis*-group in sect. *Sycocarpus*. These similarities might be an indication of a phylogenetic link.

Similarities in growth features and transitions from one type of indumentum into another suggest that this group is rather closely related to the *F. copiosa*-group. *Ficus riedelii*, endemic to Celebes and with some doubt included in the *F. ulmifolia*-group, shows in the tendency towards spirally arrangement of the leaves and features of the figs, as conspicuous lateral bracts, a rosette of bracts around the ostiole, and irritating hairs, also affinities to the *F. conocephalifolia*-group.

b. *Ficus copiosa*-group (largely ser. *Copiosae* Corner (1960)). — This group is largely similar to the *F. conocephalifolia*-group in the arrangement of the leaves and to some extent also in the variation in the length of the petioles, but the indumentum is often whitish, the rosette of bracts around the ostiole often absent, and the lateral bracts on the receptacle are small or absent. Moreover, the conspicuous lenticels on the leafy twigs below the stipules are lacking. *Ficus opposita* and *F. cumingii*, species with the short-petioled leaves predominantly (sub)opposite, but also alternate (distichous or in lax spirals) or sometimes even subverticillate, can be linked to the *F. copiosa*-group through *F. wassa*. The group thus comprises eight species: *F. balica*, *F. copiosa*, *F. cumingii*, *F. floresana*, *F. heteropoda*, *F. opposita*, *F. primaria*, *F. sciaphila*, and *F. wassa*. This group is western Malesian; *F. copiosa* and *F. opposita* extends to N Australia and the latter occurs disjunctly on an islet in the Sunda Strait.

c. *Ficus ulmifolia*-group (largely ser. *Scabrae* Miq.; Corner 1960). — This group comprises species with (usually) distichous leaves with the petioles relatively short and about equal in length on the same leafy twigs. The occasional presence of subopposite leaves (in *F. ulmifolia*) and the tendency towards spirally arranged leaves (in *F. riedelii* and *F. tonsa*) indicate links to the *F. copiosa*-group. The lamina varies considerably in shape and dimensions, and the indumentum from whitish to brownish. *Ficus leptodictya, F. tenuicuspidata,* and *F. tonsa* are (largely) glabrous. The figs are often 1–1.5 cm diam., with or without conspicuous lateral bracts. The variation in the flowers is about the same as in the previous group. This group comprises in addition to the 18 species found in the Malesian region c. 20 occurring in the Pacific islands and in Australia, and possibly the Asian mainland species *F. henryi* and *F. subincisa* (see above), broadening the diversity of the group as a whole. The 19 Malesian species are: *F. ampelas*, *F. elmeri*, *F. erinobotrya*, *F. fiskei*, *F. goniophylla*, *F. leptodictya*, *F. macrorrhyncha*, *F. melinocarpa*, *F. myiopotamica*, *F. odorata*, *F. pseudowassa*, *F. quercetorum*, *F. riedelii*, *F. schumanniana*, *F. stellaris*, *F. tenuicuspidata*, *F. tonsa*, *F. trachypison*, and *F. ulmifolia*. The uncertain position of *F. riedelii* is mentioned under the first group of the section. The species of this group are elements of the eastern part of the Malesian region, four of these species extend to the Solomon Islands, and two of them, *F. ampelas* and *F. melinocarpa*, to Sumatra.

The coherence of the three groups circumscribed above indicates that they may constitute a natural entity centred in the eastern part of the range of distribution of the subsection, in contrast to the following groups.

d. *Ficus montana*-group (including subsect. *Varinga* ser. *Exasperatae* Corner (1960)). — This group differs from the others in the drupaceous fruitlets. It is represented by three species in the eastern part of the Malesian region: *F. montana*, *F. sandanakana*, and *F. subsidens*. *Ficus montana* extends to Myanmar and is clearly related to *F. andamanica* Corner (1960) from the Andaman and Nicobar Islands. The presence of the same type of fruitlets (mostly with tuberculate endocarp bodies) link this group of Asian species to the nine *Sycidium* species from Madagascar (and adjacent islands) and continental Africa; one of them, *F. exasperata*, also occurs in Sri Lanka and India. The whole group of species with drupaceous fruitlets is distinctly centred in Africa and Madagascar, extending with some species through the Asian mainland to western Malesia and possesses two endemic species in northern Borneo. The whole group shows a morphological variability in habit and leaves that roughly resembles that of the essentially Malesian-Australasian group of species of section *Sycidium*, but in contrast to the latter group the tepals are always white and often more conspicuously hairy. The *F. montana*-group (s.l.) differs ecologically from the Malesian-Australasian group in having more shrub species and more species occurring outside forest habitats.

e. *Ficus heterophylla*-group (including subsect. *Varinga* ser. *Heterophyllae* and ser. *Cyrtophylleae*, Corner 1960). — The group comprises seven species of shrubs (or treelets) with short-petiolate distichous leaves. It includes three species found in the Malesian region: *F. asperiuscula*, *F. heterophylla*, and *F. leptogramma*, the first and third are confined to this region and the second extends to the Asian mainland, where also two other species included in subsect. *Varinga* by Corner (1960, 1965), *F. cyrtophylla* (Wall. ex Miq.) Miq. and *F. praetermissa* Corner (1960), occur. It is not quite clear whether the two Sino-Himalayan species *F. henryi* and *F. subincisa*, ranked in subg. *Ficus* ser. *Sinosysyceae* (Corner 1960) and presently referred to the *F. ulmifolia*-group, should be rather put into the *F. heterophylla*-group. The distribution of this group is linked to the Asian mainland and western Malesia. The group does not have clear features for delimitation, in particular against the *F. ulmifolia*-group; these features are: the common presence of a single waxy gland, and if there are two (in the axils of both lateral veins), then they are usually different in size; the solid leafy twigs; the persisting periderm on older twigs; and the absence of features showing intermittent growth. *Ficus heterophylla* (variable in habit) and *F. praetermissa* Corner (1960) can be procumbent shrubs and straggling to scrambling shrubs. These habits, the common presence of a single waxy gland, and (presumed) continuous growth, may relate this group to sect. *Palaeomorphe*. Inclusion of *F. exasperata* in subsect. *Varinga* (by Corner 1960) implies a link of the *F. heterophylla*-group to the African and Madagascan species. This group may, together with the *F. montana*-group and the group of African and Madagascan species, constitute an entity of the western part of the range of the subgenus, having as its sister-group the entity comprising the *F. conocephalifolia*-,

the *F. copiosa*-, and the *F. ulmifolia*-group, based in the eastern part of the range of the subgenus. The western entity and the essentially western Malesian sect. *Palaeomorphe* may have ancestry in common. In spite of these considerations, the position of the *F. heterophylla*-group remains somewhat puzzling.

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1. **Ficus ampelas** Burm.f.

Ficus ampelas Burm.f., Fl. Ind. (1768) 226, '*ampelos*'; emend. Miq., London J. Bot. 7 (1848) 428, excl. syn. Rheede; Lam., Encycl. 2, 2 (1788) 496; Miq., Pl. Jungh. (1851) 59; in Zoll., Syst. Verz. 2 (1854) 93; Fl. Ind. Bat. 1, 2 (1859) 303; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272, 292; King, Sp. Ficus 2 (1888) 90, t. 114; Kuntze, Rev. Gen. Pl. 1 (1891) 626 (var. '*politaria*'); Koord., Minah. (1898) 596; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 162; Renner, Bot. Jahrb. Syst. 39 (1907) 396; Merr., Philipp. J. Sci., 1, Suppl. (1906) 45; Philipp. J. Sci., Bot. 3 (1908) 402; Elmer, Leafl. Philipp. Bot. 1 (1906) 191; 4 (1912) 1317, 1392; 7 (1914) 2405 (sed *Elmer 13346* = *F. irisana* Elmer et *F. cumingii* Miq.); Merr., Int. Rumph. (1917) 196; Enum. Born. (1921) 220; Enum. Philipp. Flow. Pl. 2 (1923) 45; Hochr., Candollea 2 (1925) 328; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 567; Diels, Bot. Jahrb. Syst. 67 (1935) 200; Elmer, Leafl. Philipp. Bot. 9 (1937) 3465; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 288; Steenis, Blumea 6 (1948) 259; Backer, Blumea 6 (1948) 309; Corner, Gard. Bull. Singapore 17 (1960) 459; 21 (1965) 67; Backer & Bakh.f., Fl. Java 2 (1965) 25.

Ficus exasperata Roxb., Hort. Bengal. (1814) 66; Fl. Ind., ed. Carey 3 (1832) 555, non Vahl 1805; Wight, Ic. 2 (1843) t. 664.

Ficus rubricaulis Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 496; Engl., Bot. Jahrb. Syst. 7 (1886) 452.

Ficus biglandulosa Miq., London J. Bot. 7 (1848) 229, non Colla 1836.

Ficus javensis Miq., London J. Bot. 7 (1848) 232; Pl. Jungh. (1851) 61.

Ficus javensis Miq. var. *subcrenata* Miq., London J. Bot. 7 (1848) 233.

Ficus bandana Miq., Fl. Ind. Bat. 1, 2 (1859) 301. — *Ficus ampelas* Burm.f. var. *bandana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272.

Ficus ampelas Burm.f. var. *laevior* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272.

Ficus ampelas Burm.f. var. *obversifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272.

Ficus ampelas Burm.f. var. *rugosa* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272.

Ficus ampelas Burm.f. var. *sublanceolata* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272.

Ficus asperior Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; King, Sp. Ficus 2 (1888) 91, t. 116.

Ficus soronensis King, J. Asiat. Soc. Bengal 55, 2 (1887) 411; Sp. Ficus 2 (1888) 161, t. 205A; Diels, Bot. Jahrb. Syst. 67 (1935) 196. — *Ficus ampelas* Burm.f. var. *soronensis* (King) Corner, Gard. Bull. Singapore 17 (1960) 460.

Ficus tashiroi Maxim., Bull. Acad. Imp. Sci. Saint-Pétersbourg 32 (1888) 621.

Ficus kingiana Hemsl. in Hook., Ic. Pl. IV, 4 (1897) t. 2535; Hayata, Ic. Pl. Formos. 8 (1919) 120; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 55.

Ficus blepharosepala Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 246.

Ficus ampelas Burm.f. forma *bogoriensis* Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 166. — *Ficus ampelas* Burm.f. var. *bogoriensis* (Koord. & Valeton) Hochr., Candollea 2 (1925) 328.

Ficus fastigiata Elmer, Leafl. Philipp. Bot. 1 (1906) 44; 1 (1907) 240; Merr., Philipp. J. Sci., Bot. 5 (1910) 342; Enum. Philipp. Flow. Pl. 2 (1923) 52; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 244.

Ficus irisana Elmer, Leafl. Philipp. Bot. 1 (1906) 46; 2 (1908) 535; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 243; Corner, Gard. Bull. Singapore 21 (1965) 69.

Ficus guyeri Elmer, Leafl. Philipp. Bot. 1 (1906) 196; 1 (1907) 250; 2 (1908) 540; 4 (1911) 1256; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 53, excl. syn.; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 289; Corner, Gard. Bull. Singapore 21 (1965) 67.

Ficus validicaudata Merr., Philipp. J. Sci., 1, Suppl. (1906) 45; Enum. Philipp. Flow. Pl. 2 (1923) 53 (sub *F. guyeri)*; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 289, 290. — *Ficus guyeri* Elmer var. *validicaudata* (Merr.) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 290. — *Ficus irisana* Elmer var. *validicaudata* (Merr.) Corner, Gard. Bull. Singapore 17 (1960) 464.

Ficus todayensis Elmer, Leafl. Philipp. Bot. 4 (1911) 261; 7 (1914) 2403; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 67; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 243; Corner, Gard. Bull. Singapore 21 (1965) 68.

Ficus sibuyanensis Elmer, Leafl. Philipp. Bot. 4 (1911) 1319; 7 (1914) 2406 (excl. *Elmer 13719* = *F. guyeri* Elmer); Merr., Enum. Philipp. Flow. Pl. 2 (1923) 65; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 288. — *Ficus guyeri* Elmer var. *sibuyanensis* (Elmer) Corner, Gard. Bull. Singapore 17 (1960) 460.

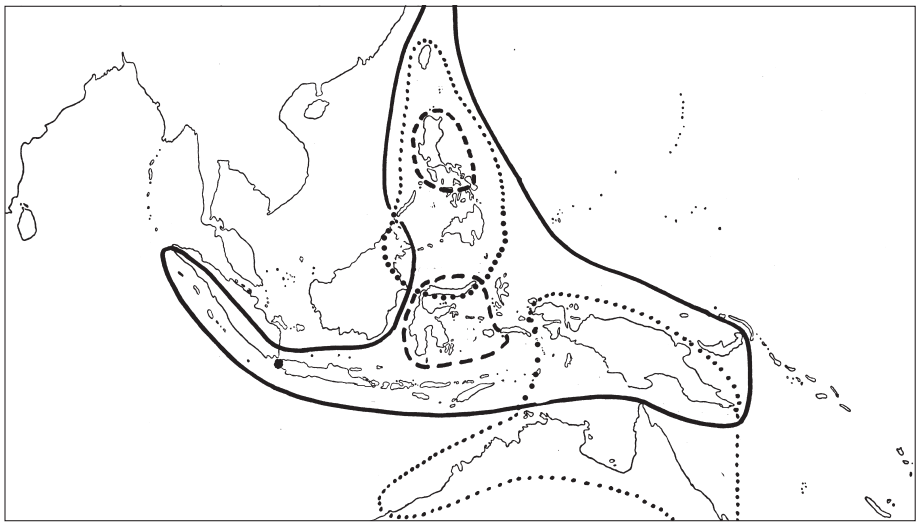
Ficus fachikoogi Koidz., Bot. Mag. Tokyo 27 (1913) 185.

Ficus ampelas Burm.f. var. *bogoriensis* (Koord. & Valeton) Hochr. forma *incrassata* Hochr., Candollea 2 (1925) 328.

?*Ficus guyeri* Elmer var. *minimifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 290 (no specimen cited). — *Ficus tenuicuspidata* Corner var. *major* Corner, Gard. Bull. Singapore 17 (1960) 465.

Ficus politoria auct. non Lam.: Blume, Bijdr. (1825) 472; Miq., Fl. Ind. Bat. 1, 2 (1859) 298. — *Ficus ampelas* Burm.f. var. *politoria* (Blume) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272.

Shrub or tree up to 15(–25) m tall; milksap watery, scanty or lacking. *Branchlets* often drying (dark) brown to blackish. *Leafy twigs* 1–2 mm thick, minutely hispidulous to subglabrous (or, especially when juvenile, puberulous to hirtellous), scabridulous (to smooth); internodes solid. *Leaves* distichous; lamina oblong to elliptic to subovate (to subrhombic or to lanceolate), (2–)4–10(–20) by (1–)1.5–5(–7) cm, ± asymmetric to almost symmetric, subcoriaceous to chartaceous, apex acuminate (to subacute) or to caudate, base slightly inequilateral, cuneate (to obtuse or to rounded), margin (sub)entire (or crenate-dentate or when juvenile to lobate), ± revolute; upper surface minutely hispidulous, ± scabrous to smooth, sometimes ± shining, lower surface minutely hispidulous to (sub)glabrous (when juvenile puberulous to hirtellous on the main veins), ± scabrous to smooth; cystoliths on both sides; lateral veins (3–)4–8 pairs, the basal pair running close to the margin, up to (1/5–)1/4–1/2 the length of the lamina, unbranched, tertiary venation (laxly) scalariform to (sub)reticulate; waxy glands (often) in (extensions of) the axils of both basal lateral veins, rather small, rarely an additional gland in the axils of other lateral veins; petiole 0.2–1 cm long, slightly different to almost equal in length on the same twig, minutely hispidulous (or, especially when juvenile, puberulous to hirtellous), the epidermis persistent; stipules amplexicaul (or semi-amplexicaul), 0.2–0.7 cm long, glabrous (or especially when juvenile, minutely puberulous on the keel), caducous. *Figs* axillary, solitary or in pairs, or ± clearly ramiflorous, clustered on spurs below the leaves; peduncle 0.2–1(–2.5) cm long; peduncular bracts 1–3, scattered, 2 (sub)opposite (or 3 subverticillate), c. 0.5–1(–1.5) mm long; receptacle (sub)globose, 0.3–1(–1.5) cm diam. when dry, sparsely to densely (minutely) hispidulous, scabrous to scabridulous, with few small or without lateral bracts, yellow to orange to red to red-brown or purple at maturity, apex convex to slightly umbonate, ostiole 1–2 mm diam., surrounded by a low rim; the wall sometimes thick; internal



Map 3. Distribution of some species of subg. *Sycidium* sect. *Sycidium*: *F. ampelas* Burm.f. (continuous line); *F. cumingii* Miq. (dotted line, northern); *F. opposita* Miq. (dotted line, southern and black dot); *F. riedelii* Teijsm. ex Miq. (broken line, southern); *F. ulmifolia* Lam. (broken line, northern).

hairs abundant. *Tepals* dark red to pinkish to whitish, glabrous or hairy at the apex. *Styles* glabrous. — **Map 3.**

Distribution — Ryukyu Islands and Taiwan; in *Malesia*: Sumatra (westcoast and islands), Java, Borneo, Philippines, Celebes, Lesser Sunda Islands (Bali, Lombok, Flores, Timor), Moluccas, New Guinea (incl. New Britain).

Habitat — Forest and secondary growth, mostly at low altitudes, but in the Philippines up to 2400 m.

Notes — 1. The species is rather variable. The variation led to the recognition of some varieties by Corner (1960). However, the differences are so small that clear infraspecific entities cannot be distinguished, at most be regarded as regional variations with regard to (almost) smooth laminas, common in New Guinea and part of the Moluccas. The characters used to distinguish *F. guyeri*, *F. irisina*, and *F. todayensis* (Corner 1960, 1965) are so weak that these entities have to be included in *F. ampelas*, broadening its variation somewhat.

2. A good number of collections from the Philippines (Luzon to Mindanao) are distinct in the caudate apices of the usually smooth lamina in which the basal lateral veins often run up to the middle of the lamina and in the relatively long fig peduncles (up to 1.5 cm, or occasionally up to 2.5 cm long). But this form is linked with the typical widespread form by intermediates (from Luzon, Sibuyan, Panay, Samar), including the type of *F. guyeri* var. *sibuyanensis*.

3. Material referred to *F. irisana* (Corner 1965) appears to be distinct only in the red tepals, and as the colour of the tepals varies in many species from dark red to pink or whitish, there is no good reason to recognize it as a distinct species. Several collections with small (sub)caudate laminas, regarded as representatives of *F. irisana* and put in its var. *validicaudata* (Corner 1960), resemble material referred to *F. guyeri*.

4. Material with small caudate laminas are often associated with high altitudes (up to 2400 m) and exposed habitats. These laminas are often small, but may be large, up to 20 cm long (e.g., *Ramos et al. 38635*, the type of *F. tenuicaudata* var. *major*, and *Sulit 9938*).

5. A few collections (from the Philippines and Celebes) characterized by relatively large fig receptacles (1.2–1.5 cm diam. when dry) with thick walls and by red-coloured tepals have been inserted in *F. todayensis*. They cannot be distinguished from more typical *F. ampelas* material in other features.

6. *Ficus ampelas* var. *linearis* Corner (Gard. Bull. Singapore 17 (1960) 460) is in the present treatment included in *F. cumingii*.

7. *Ficus ampelas* var. *hispidula* is currently included in *F. anasomosans*.

8. Many collections from the Philippines, the Moluccas, and New Guinea have (almost) smooth laminas.

9. The presence of this species in Borneo is not very certain, as it is represented by a single collection (by *De Vriese*) without precise indication of provenance.

10. *Ficus ampelas* is related to *F. leptodictya* from which it differs in the smaller fig receptacle and the shorter peduncle.

2. Ficus asperiuscula Kunth & C.D. Bouché

Ficus asperiuscula Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 21; Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 253; Miq., London J. Bot. 7 (1848) 234; Pl. Jungh. (1851) 58; Fl. Ind. Bat. 1, 2 (1859) 300; Corner, Gard. Bull. Singapore 17 (1960) 473; 21 (1965) 73; Backer & Bakh.f., Fl. Java 2 (1965) 26.

Ficus coronata Reinw. ex Blume, Bijdr. (1825) 470, non Spin. ex Colla 1824; Miq. in Zoll., Syst. Verz. 2 (1854) 77; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292.

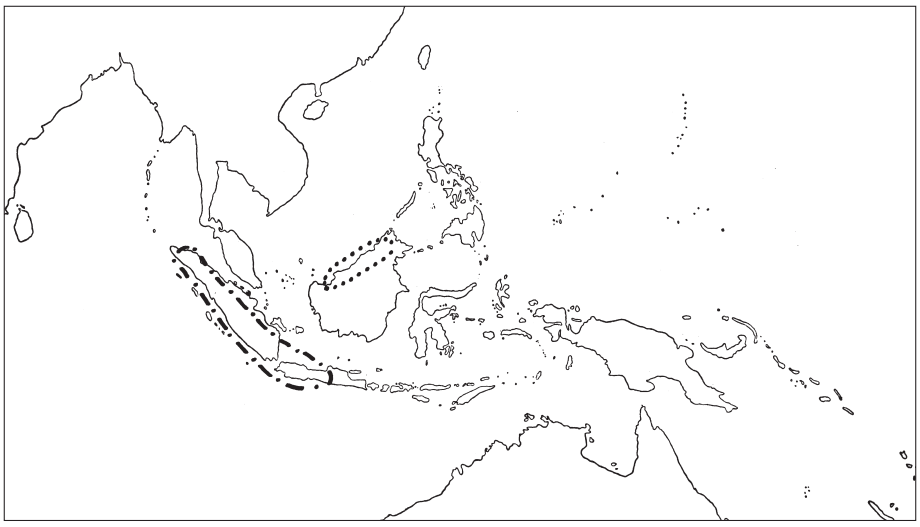
Ficus grewiifolia Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 21, nom. in synon., non Blume 1825.

Covellia zollingeriana Miq., London J. Bot. 7 (1848) 460; Fl. Ind. Bat. 1, 2 (1859) 322.

Ficus leptorhyncha Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 156; Koord., Exk. Fl. Java 4 (1924) t. 763.

Ficus inaequilatera Ridl., J. Straits Branch Roy. Asiat. Soc. 1 (1923) 93.

Shrub up to 2 m tall. *Branchlets* drying (red-)brown. *Leafy twigs* 1–3 mm thick, whitish puberulous to subhirtellous, (partly) with (often ± retrorse) uncinate hairs, smooth; internodes solid. *Leaves* distichous; lamina oblong (to lanceolate) or to ovate (or to subobovate) and pinnately lobed to fid, 5–14 by 1.5–7 cm, (almost) symmetric to ± asymmetric, chartaceous, apex acuminate to subacute, base (almost) equilateral to inequilateral, rounded to subcordate or to cuneate, margin dentate (to lobate) or subentire, often ± revolute; upper surface sparsely to rather densely (minutely) hispidulous, ± scabrous to smooth, lower surface sparsely minutely to rather densely hispidulous to (sub)puberulous, (partly) with uncinate hairs, ± scabrous to smooth; cystoliths on both sides; lateral veins 4–9 pairs, the basal pair up to 1/6–1/3 the length of the lamina, if running close to the margin of the lamina then unbranched, 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, (partly) with (often ± retrorse) uncinate hairs, the epidermis persistent; stipules semi-amplexicaul to amplexicaul, 0.3–0.5 cm long, puberulous, keeled, caducous. *Figs* axillary, solitary, or



Map 4. Distribution of some species of subg. *Sycidium* sect. *Sycidium*: *F. asperiuscula* Kunth & C.D. Bouché (dot-dash line); *F. leptogramma* Corner (dotted line).

(mostly 4) clustered on short spurs; peduncle 0.2–0.4 cm long; peduncular bracts 1–3, scattered, 2 opposite, or 3 verticillate, mostly near the base, 0.5–1 mm long; receptacle (sub)globose to ellipsoid, 0.5–1.2 cm diam. when dry, 1.2–1.5 cm diam. when fresh, white puberulous to subhispidulous, with (often ± retrorse) uncinate hairs, smooth to scabridulous, without lateral bracts, ('seed figs') red to purple-black or ('gall figs') pale red at maturity, apex convex to ± umbonate, ostiole c. 2 mm diam., surrounded by a rim, the outer ostiolar bracts pointing upwards; internal hairs absent or few. *Tepals* whitish, glabrous or minutely hairy at the apices. *Styles* glabrous. — **Map 4.**

Distribution — Sumatra and Java (western and central).

Habitat — Forest and secondary growth, at altitudes to c. 1500 m.

Note — This species is distinct in the occurrence of uncinate hairs, an unusual type of indumentum in *Ficus*.

3. Ficus badiopurpurea Diels

Ficus badiopurpurea Diels, Bot. Jahrb. Syst. 67 (1935) 212; Corner, Gard. Bull. Singapore 21 (1965) 64.

Tree up to 10 m tall. *Leafy twigs* 1.5–4 mm thick, densely dark brown to purplish hirtellous to subhirsute; internodes solid. *Leaves* spirally arranged; lamina oblong to subobovate to lanceolate, 17–28 by 7–9.5 cm, (almost) symmetric, chartaceous, apex acuminate to subcaudate, base narrowly cordate to rounded, margin denticulate; upper surface brown to whitish strigillose to hirtellous, smooth to scabridulous, lower surface dark brown hirtellous on the veins, smooth; cystoliths only beneath; lateral veins 7–10 pairs, the basal pair up to 1/8–1/4 the length of the lamina, unbranched or other lower lateral veins ± branched, tertiary venation scalariform; waxy glands absent (?); petiole

1–6 cm long, varying distinctly in length on the same twig, dark brown to purplish hirtellous, the epidermis persistent; stipules semi-amplexicaul, 0.5–1 cm long, brown strigillose, subpersistent or caducous. *Figs* cauliflorous to flagelliflorous, clustered on up to 2 cm long leafless branchlets with short internodes on leafy branches on the trunk or on 2–3 m long rooting stolons with long internodes (departing from the base of the trunk?); subsessile or with a peduncle up to 0.4 cm long; peduncular bracts 2 or 3, scattered, 0.5–1 mm long; receptacle (sub)globose, 0.4–0.6 cm diam. when dry, 0.5–0.8 cm diam. when fresh, dark brown setulose (the hairs patent to appressed), with few up to 1 mm long lateral bracts, colour at maturity unknown, apex ± umbonate, ostiole c. 1 mm diam., surrounded by rosette of up to 1 mm long apical bracts; internal hairs sparse, white. *Tepals* dark red, partly connate, glabrous. *Styles* glabrous.

Distribution — New Guinea (eastern).

Habitat — Forest, at altitudes up to c. 1000 m.

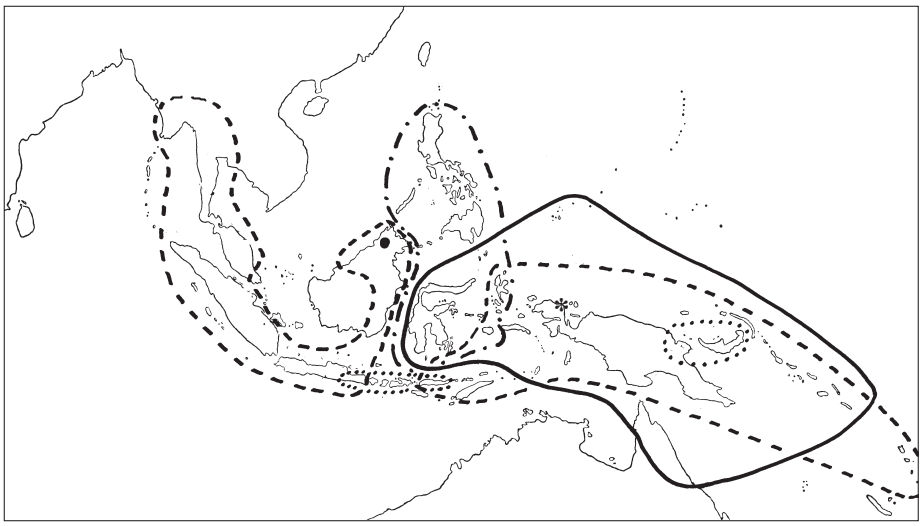
Notes — 1. This species is unusual in the subgenus in the presence of flagelliflory. Moreover, the tepals of the pistillate flowers are distinctly connate.

2. The species is probably related to *F. porphyrochaete*.

4. Ficus balica Miq.

Ficus balica Miq., Fl. Ind. Bat. 1, 2 (1859) 314; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; King, Sp. Ficus 2 (1888) 84, t. 107; Corner, Gard. Bull. Singapore 21 (1965) 65.
Ficus gigantea Noroña, Verh. Batav. Genootschap 5, ed. 1 (1790) 76, nom.nud.
Ficus albinervia Miq., Fl. Ind. Bat. 1, 2 (1859) 315; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294.
Ficus balica Miq. var. *colfsii* Corner, Gard. Bull. Singapore 17 (1960) 456.

Tree up to 12 m tall. *Leafy twigs* 2–4 mm thick, sparsely whitish puberulous to subhispidulous to (sub)glabrous (or densely tomentose), smooth or scabridulous; internodes solid or hollow. *Leaves* in lax spirals, sometimes (sub)opposite; lamina oblong to elliptic (to (sub)obovate), 9–30 by 5–12 cm, symmetric or slightly asymmetric, chartaceous to subcoriaceous, apex acuminate, base cordate to subcordate, margin entire to coarsely crenate-dentate, often ± revolute; upper surface glabrous or sparsely hispidulous (or rather densely subtomentose on the midrib), smooth to scabrous, lower surface very sparsely hispidulous on the main veins (or densely tomentose on all veins), scabrous to smooth; cystoliths on both sides; lateral veins 5–9 pairs, the basal pair up to (1/5–)1/4–1/3 the length of the lamina, these and sometimes also other lateral veins branched or furcate, tertiary venation (laxly) scalariform; waxy glands in the axils of both basal lateral veins; petiole (1–)3–7 cm long, slightly different to almost equal in length on the same twig, (very) sparsely puberulous (or densely tomentose), the epidermis ± flaking off, mostly clearly so at the basal and upper part; stipules lateral, subovate, chartaceous, c. 0.5 cm long, minutely appressed-puberulous, caducous. *Figs* axillary, solitary or in pairs, mostly ramiflorous to cauliflorous, on (clusters of) spurs and up to 2 cm leafless branchlets with short internodes, down to the trunk; peduncle 0.5–1.5(–3) cm long; peduncular bracts 1 or 2, scattered or subopposite, c. 0.5 mm long; receptacle (sub)globose to ellipsoid, 0.4–0.5, 0.8–1.2 or 1–1.5 cm diam. when dry, very sparsely to rather densely (sub)hispidulous (or densely subtomentose), the



Map 5. Distribution of some species of subg. *Sycidium* sect. *Sycidium*: *F. balica* Miq. (dotted line, western); *F. copiosa* Steud. (continuous line); *F. heteropoda* Miq. (dot-dash line); *F. montana* Burm.f. (broken line, western Malesia); *F. primaria* Corner (dotted line, eastern and *); *F. subsidens* Corner (dot); *F. wassa* Roxb. (broken line, eastern Malesia).

rigid hairs often with a ± swollen base, scabridulous, with few 0.5–1 mm long lateral bracts or none, colour at maturity unknown, apex ± convex to umbonate, ostiole 1–1.5 (or 3–3.5) mm diam., surrounded by a low to high rim; internal hairs minute, abundant to few or absent. *Tepals* red, (sparsely) hairy at the apices. *Styles* glabrous or sparsely hairy. — **Map 5.**

Distribution — Java (eastern) and Lesser Sunda Islands (Bali, Lombok, Sumbawa, Flores).

Habitat — Monsoon forest, at altitudes up to 1200 m.

Notes — 1. This tree species resembles the usually frutescent *F. montana,* co-occurring in Java. The latter can be distinguished by the cuneate to rounded base of the lamina, the longer and more stiff stipules, and the persistent epidermis of the petiole.

2. This species does not show the features characteristic for intermittent growth.

3. In Lombok, Sumbawa, and Flores, most collections are distinct in the dense (sub)tomentose indumentum on the leafy twig, the petiole, the midrib above, the veins of the lamina beneath, and/or on the fig receptacle and peduncle. Among these collections there are some in Flores which have fig receptacles (1–1.5 cm diam.) on long peduncles (up to 2.5 cm long). The hairy form with large figs has been recognized by Corner (1960) as var. *colfsii*. In Flores, both a densely hairy and a sparsely hairy form as well as a form with a small fig receptacles (0.4–0.5 cm diam. when dry) with short peduncles and the form with the large figs can be found.

4. In Flores, these forms of this species also co-occur with *F. wassa*, which can be distinguished from the sparsely hairy form by the somewhat longer and narrow (sub-subulate) stipules, the persistent epidermis of the petiole, and the usually cuneate to rounded base of the lamina.

5. Ficus complexa Corner

Ficus complexa Corner, Gard. Bull. Singapore 17 (1960) 450; 21 (1965) 63.

Tree up to 10 m tall, much branched. *Leafy twigs* 3–10(–15) mm thick, brown hirsute, conspicuous lenticels just below the (scars of the) stipules; internodes solid (or partly hollow). *Leaves* spirally arranged; lamina elliptic to oblong or to (sub)ovate, 8–32 by

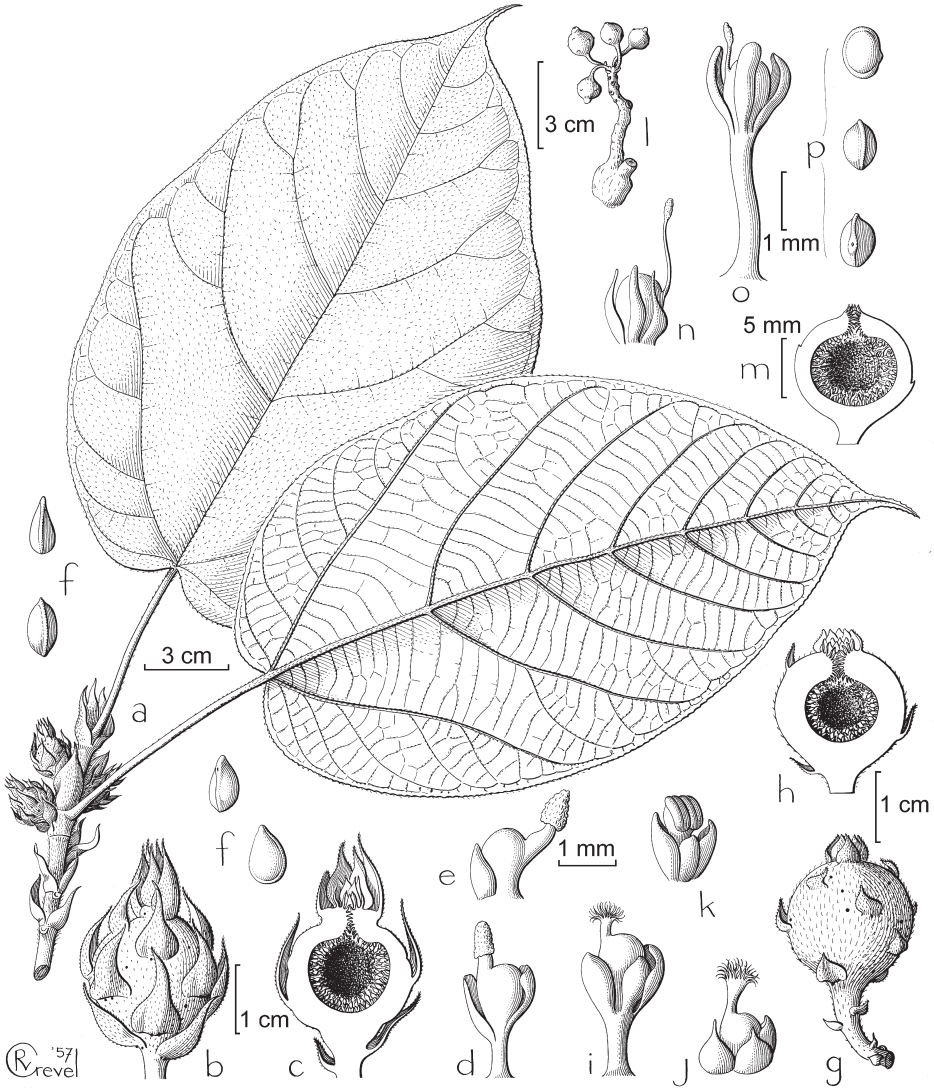


Fig. 39. a–k: *Ficus complexa* Corner. a. Leafy twigs with figs; b, c. 'seed-figs'; d, e. long-styled flowers; f. fruits; g, h. 'gall-figs'; i, j. short-styled flowers; k. staminate flower. — l–p: *Ficus porphyrochaete* Corner. l. Fig-bearing branchlet; m. 'seed-fig'; n, o. long-styled flowers; p. fruits (a–k: *Carr 14032*; l–p: *Carr 16381*).

3–20 cm, symmetric, chartaceous, apex acuminate, base (sub)cordate, margin denticulate; upper surface pale brown to whitish hispid, scabrous, lower surface brown hirsute to hirtellous on the veins, scabridulous; cystoliths only beneath; lateral veins 6–8 pairs, the (main) basal pair up to 1/4–1/3(–1/2) the length of the lamina, these and the lower other lateral veins usually branched or furcate, tertiary venation scalariform; waxy glands in the axils of the (main) basal lateral veins; petiole (1.5–)4–15(–20) cm long, often varying considerably in length on the same twig, brown hirsute, the epidermis ± flaking off; stipules semi-amplexicaul, (1–)1.5–4.5 cm long, densely white appressed-puberulous, usually to brown strigose, mainly on the midrib, (sub)persistent. *Figs* axillary, in pairs or solitary, or also cauliflorous, on up to 5 cm long leafless branches with short internodes, (sub)sessile or up to 1 cm long pedicellate; peduncular bracts 2–4, scattered, up to 8 mm long; receptacle subglobose, 1–1.5 cm diam. when dry, 1.5–2 cm diam. when fresh, dark brown hirsute to subsetose to white or brown hispidulous, the rigid hairs with a swollen base, with numerous to few lateral bracts, being subovate and 5–20 mm long, up to 7 mm wide, stiff coriaceous, and white appressed-puberulous to brown strigose, if long and numerous covering the fig receptacle entirely, if short and sparse, then not so, red at maturity, apex ± convex, ostiole c. 4 mm diam., surrounded by a rosette of up to 8 mm long apical bracts, pointing upwards; internal hairs absent or sparse. *Tepals* dark red, glabrous. *Styles* glabrous; stigma conspicuously papillate. — **Fig. 39.**

Distribution — New Guinea (eastern).

Habitat — Primary forest and secondary growth, at altitudes between c. 1200 and c. 2200 m.

6. **Ficus conocephalifolia** Ridl.

Ficus conocephalifolia Ridl., Phytogeogr. & Fl. Arfak Mts 208 (1917); Diels, Bot. Jahrb. Syst. 67 (1935) 204; Corner, Gard. Bull. Singapore 21 (1965) 63.

Shrub or sparingly branched tree up to 7(–13) m tall. *Leafy twigs* 4–8 mm thick, (dark) brown strigose (to hirsute), conspicuous lenticels just below the (scars of the) stipules; internodes solid. *Leaves* spirally arranged to subopposite; lamina oblong to subobovate (or to elliptic), 10–35(–45) by 5–18(–22) cm, ± symmetric or ± asymmetric, chartaceous (to subcoriaceous), apex acuminate, base rounded to cuneate (or subcordate), margin entire or denticulate (towards the apex) or subentire; upper surface sparsely puberulous to subhispidulous, smooth to scabridulous, lower surface sparsely to rather densely dark brown strigose to strigillose (to hirtellous) on the main veins or also puberulous on the smaller ones, smooth; cystoliths on both sides; lateral veins 7–9 pairs, the (main) basal pair up to 1/3–1/2(–2/3) the length of the lamina, these and also the lower other lateral veins usually branched or furcate, tertiary venation scalariform; waxy glands in the axils of the (main) basal lateral veins, often smaller ones in the axils of other lateral veins; petiole 1.5–12(–30) cm long, usually varying considerably in length on the same twig, dark brown strigose to strigillose, the epidermis ± flaking off; stipules semi-amplexicaul, (1–)1.5–4.5(–5) cm long, sparsely to rather densely dark (to pale) brown strigose to strigillose or also whitish appressed-puberulous, (sub)persistent. *Figs* axillary, in pairs or solitary, or also cauliflorous, on up to 15 cm long, unbranched

or sparingly branched leafless branches with short internodes, at the base of the trunk; subsessile or up to 1.5 cm long pedunculate; peduncular bracts 2 or 3, scattered, 2–8(–10) mm long; receptacle subglobose to ellipsoid, (1–)1.5–2(–3) cm diam. when dry, 2.5–3.5(–5) cm diam. when fresh, brown hirsute to subsetose with irritant hairs with a swollen base, with some up to 5 mm long lateral bracts, red at maturity, apex ± convex to flat, ostiole 3–4 mm diam., surrounded by a rosette of apical bracts, pointing upwards; internal hairs absent or sparse. *Tepals* red-brown, glabrous. *Styles* glabrous.

Distribution — New Guinea.

Habitat — Forest and secondary growth, at altitudes up to 1000 m.

Note — According to *Henty NGF 10557*, the fig cavity is filled with a gelatinous liquid.

7. **Ficus copiosa** Steud.

Ficus copiosa Steud., Nomencl. Bot. ed. 2, 1 (1841) 635; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 271, 291; King, Sp. Ficus 2 (1888) 85, t. 109, excl. sched. Beccari, PS 772 quae est *F. madurensis*; Koord., Minah. (1898) 598; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 181; Koord., Atlas Baumart. Java 4 (1918) t. 758; Backer & Bakh.f., Fl. Java 2 (1965) 25; Corner, Gard. Bull. Singapore 21 (1965) 65; Philos. Trans., Ser. B, 253 (1967) 93, f. 25.

Ficus polycarpa Roxb., Fl. Ind., ed. Carey 3 (1832) 556, non Jacq. 1767; Wight, Ic. 2 (1843) t. 632; Miq., London J. Bot. 7 (1848) 233; Pl. Jungh. (1851) 57; Fl. Ind. Bat. 1, 2 (1859) 300.

Ficus muriculata Miq. in Zoll., Syst. Verz. 2 (1854) 93, 98; Fl. Ind. Bat. 1, 2 (1859) 299; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272; Summerh., J. Arnold Arbor. 22 (1941) 96. — *Ficus copiosa* Steud. var. *muriculata* (Miq.) King, Sp. Ficus 2 (1888) 86.

Ficus brevicuspis Miq., Fl. Ind. Bat. 1, 2 (1859) 315; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; King, Sp. Ficus 2 (1888) 84, t. 106; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 183; Renner, Bot. Jahrb. Syst. 39 (1907) 396; Koord., Atlas Baumart. Java 4 (1918) t. 759 A–E.

Ficus magnifolia F. Muell., Fragm. Phyt. Austral. 4 (1863) 50; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296, 297; Benth., Fl. Austral. 6 (1873) 171; F.M. Bailey, Queensl. Fl. 5 (1902) 1472; Compr. Cat. Qld. Pl. (1913) 487.

Ficus subinflata Warb., Feddes Repert. Spec. Nov. Regni Veg. 1 (1905) 76.

Ficus senfftiana Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 247; Diels, Bot. Jahrb. Syst. 69 (1938) 399.

Ficus duriuscula King var. *grandifolia* Diels, Bot. Jahrb. Syst. 67 (1935) 208.

Ficus longipedunculata Rech., Feddes Repert. Spec. Nov. Regni Veg. 11 (1912) 179; Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. (1913) 541, 589, f. 27; Diels, Bot. Jahrb. Syst. 67 (1935) 208; Summerh., J. Arnold Arbor. 22 (1941) 96.

Ficus krausseana Rech., Feddes Repert. Spec. Nov. Regni Veg. 11 (1912) 180; Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. 89 (1914) 538, t. 3, f. 7b.

Ficus acanthophylla Summerh., J. Arnold Arbor. 10 (1929) 142; Diels, Bot. Jahrb. Syst. 67 (1935) 208.

Ficus copiosa Steud. var. *pubescens* Corner, Gard. Bull. Singapore 17 (1960) 455; Philos. Trans., Ser. B, 153 (1967) 94.

Tree up to 20(–30) m tall. *Leafy twigs* 3–7 mm thick, sparsely whitish hispidulous (to almost aculeate) to rather densely subhispidulous to puberulous and ± scabrous to glabrous and smooth, with some small lenticels just below the (scars of the) stipules; internodes solid or hollow. *Leaves* (sub)opposite or spirally arranged, those of pairs usually unequal; lamina oblong to elliptic to (sub)obovate, 6–35 by 3–18 cm, symmetric or slightly asymmetric, subcoriaceous, apex acuminate, base cordate to rounded to cuneate,

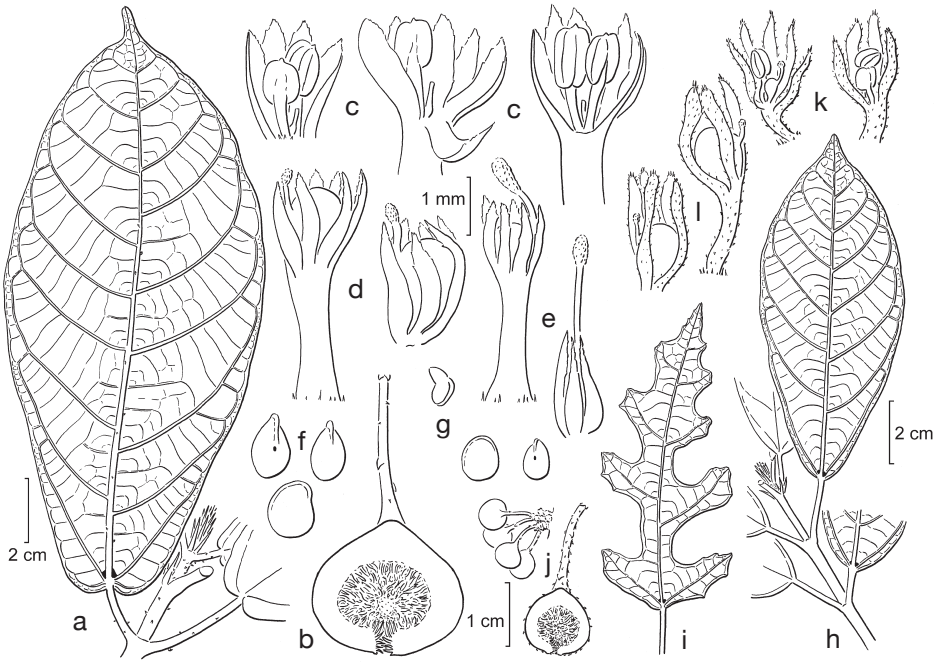


Fig. 40. a–g: *Ficus copiosa* Steud. a. Leafy twig; b. fig; c. staminate flowers; d. short-styled flowers; e. long-styled flowers; f. fruits; g. embryo. — h–l: *Ficus wassa* Roxb. h. Leafy twig; i. leaf; j. figs; k. staminate flowers; l. short-styled flowers (all: collections used unknown). From Philos. Trans., Ser. B, 253 (1967) 94.

margin entire to irregularly crenate-dentate (or when juvenile pinnately lobed), often ± revolute; upper surface glabrous, smooth or ± scabrous, lower surface sparsely hispidulous to rather densely subhispidulous to puberulous on the (main) veins, scabridulous; cystoliths on both sides; lateral veins (4–)6–10 pairs, the basal pair up to 1/6–1/3 the length of the lamina, these and sometimes also other lateral veins branched or furcate, tertiary venation (laxly) scalariform; waxy glands in the axils of both basal lateral veins or occasionally also smaller ones in the axils of other lateral veins; petiole (1–)3–9.5 cm long, usually varying distinctly in length on the same twig, 1.5–3 mm thick, sparsely hispidulous to densely puberulous or glabrous, the epidermis in the middle part persistent, but in the basal and upper part (in dry material often darker coloured) ± flaking off; stipules semi-amplexicaul to lateral, 0.5–1 or 1–2 cm long, often subsubulate, glabrous or appressed-puberulous, caducous, on twig apices often tufts of (sub)persistent stipules. *Figs* axillary, solitary, mostly ramiflorous to cauliflorous, on (clusters of) spurs and up to 6 cm leafless branchlets with short internodes, down to the trunk; peduncle 1–6 cm long; peduncular bracts 1–3, 0.5–1 mm long; receptacle (sub)globose, 1–2(–2.5) cm diam. when dry, 2–3(–6?) cm diam. when fresh, (sparsely) hispidulous or puberulous as well, ± scabrous (or smooth), often conspicuously lenticellate, (usually) with few 0.5–1 mm long lateral bracts, yellow (or red or purple) at maturity, apex ± convex to umbonate, ostiole c. 3 mm diam., surrounded by a low to high rim; internal hairs minute,

few to abundant or absent. *Tepals* whitish to reddish, (sparsely) hairy at the apices or glabrous. *Styles* glabrous. — **Fig. 40a–g; Map 5.**

Distribution — From Malesia extending to Australia (Queensland), the Solomon Islands, Micronesia (Palau: Yap), and Vanuatu (Tegua); in *Malesia*: Celebes (incl. Sangi Islands), Moluccas (Talaud Islands, Morotai, Halmahera, Buru, Ceram, Ambon, Tanimbar Islands, Aru Islands), New Guinea (incl. Admiralty Islands).

Habitat — Forest and secondary growth, at altitudes up to c. 1700 m; often grown in villages.

Uses — Young leaves and figs are eaten, raw or cooked; bark is used for cloth.

Notes — 1. The species can easily be recognized by the clear differences in surface of the middle and both the basal and upper part of the petiole.

2. Material (recognized by Corner as var. *pubescens*) in which the short rigid hairs are mixed with much thinner hairs and the stipules are (usually) puberulous is found almost throughout the range of the species.

3. In New Guinea, the stipules are usually up to 1 cm long, whereas mostly 1–2 cm long in the Moluccas and the Solomon Islands.

4. A collection from Yap (referred to this species by Corner 1965) needs to be complemented with additional material to confirm its identity.

5. Waxy glands in the axils of other lateral veins than the basal ones often occur in material from the Solomon Islands, but not in that from New Guinea.

8. Ficus cumingii Miq.

Ficus cumingii Miq., London J. Bot. 7 (1848) 235; Fl. Ind. Bat. 1, 2 (1859) 301; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292; Náves & Fern.-Vill., Nov. App. (1880) 200; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 253; King, Sp. Ficus 2 (1888) 92, t.118; Merr., Bull. Bur. For. Philipp. 1 (1903) 18; Elmer, Leafl. Philipp. Bot. 1 (1906) 53; Merr., Philipp. J. Sci., Bot. 5 (1910) 342; Fl. Manila (1912) 174; Enum. Philipp. Flow. Pl. 2 (1923) 50; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 29, t. 30, 31, 238, 284; Corner, Gard. Bull. Singapore 21 (1965) 66.

Ficus fallax Miq., Fl. Ind. Bat. 1, 2 (1859) 308; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292; King, Sp. Ficus 2 (1888) 181; Corner, Gard. Bull. Singapore 21 (1965) 66; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 268.

Ficus angustissima Merr., Publ. Gov. Lab. Philipp. 29 (1905) 11; Elmer, Leafl. Philipp. Bot. 1 (1907) 251; 4 (1911) 1317 (but *Elmer 12418* = *F. cumingii* var. *terminalifolia* (Elmer) Sata); 7 (1914) 2404 (as *F. cumingii*); Merr., Enum. Philipp. Flow. Pl. 2 (1923) 45; Elmer, Leafl. Philipp. Bot. 9 (1937) 3466; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 264. — *Ficus cumingii* Miq. var. *angustissima* (Merr.) Corner, Gard. Bull. Singapore 17 (1960) 458.

Ficus multiramea Elmer, Leafl. Philipp. Bot. 4 (1911) 1259; 9 (1937) 3482 (as *F. cumingii* Miq.).

Ficus terminalifolia Elmer, Leafl. Philipp. Bot. 4 (1911) 1318. — *Ficus cumingii* Miq. var. *terminalifolia* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 239, 285.

?*Ficus kusanoi* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30 (1911) 275; Ic. Pl. Formos. 8 (1919) 121, f. 47; Kaneh., Formos. Trees (1917) 522; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 52.

Ficus celtoides Elmer, Leafl. Philipp. Bot. 4 (1912) 1388; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 49; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 285.

?*Ficus euphlebia* Merr., Philipp. J. Sci., Bot. 8 (1913) 364.

Ficus worcesteri Merr., Philipp. J. Sci., Bot. 9 (1914) 274; Enum. Philipp. Flow. Pl. 2 (1923) 68; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 267. — *Ficus cumingii* Miq. var. *worcesteri* (Merr.) Corner, Gard. Bull. Singapore 17 (1960) 458.

Ficus producta Merr., Philipp. J. Sci., Bot. 9 (1914) 270; Enum. Philipp. Flow. Pl. 2 (1923) 62; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 287.

?*Ficus somai* Hayata, Ic. Pl. Formos. 8 (1919) 121, f. 48; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 62 (no specimen known).

Ficus cumingii Miq. var. *auriculifera* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 29, t. 30, 31, 238, 284.

Ficus cumingii Miq. var. *linearicaudata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 239, 285.

?*Ficus linearipseudopalma* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 325.

Ficus ampelas Burm.f. var. *linearis* Corner, Gard. Bull. Singapore 17 (1960) 460.

Ficus chaii Kochummen, Gard. Bull. Singapore 50 (1998) 203; Tree Fl. Sabah & Sarawak 3 (2000) 266.

Ficus angustissima auct. non Merr.: Elmer, Leafl. Philipp. Bot. 4 (1911) 1255.

Shrub or much-branched treelet up to 5 m, sometimes up to 12 m tall. *Branchlets* drying brownish to greyish. *Leafy twigs* 1–3 mm thick, whitish minutely hispidulous, ± scabrous; internodes solid. *Leaves* (sub)opposite (and the pairs partly decussate) or alternate and distichous or in lax spirals; lamina oblong to subobovate to elliptic or to (ob)lanceolate to linear, (1.5–)4–16(–37) by (0.5–)1.5–7(–17) cm, (almost) symmetric (or rarely distinctly asymmetric by an unilateral lobe), chartaceous to subcoriaceous, apex acuminate to subcaudate or to subacute, base (almost) equilateral (or rarely distinctly inequilateral), cuneate to rounded, flat or slightly revolute, margin coarsely to faintly crenate-dentate to lobate (in narrow leaves at the base, unilaterally or bilaterally) or to entire; upper surface sparsely minutely hispidulous, ± scabrous, lower surface sparsely minutely hispidulous to subglabrous, ± scabrous to smooth; cystoliths on both sides; lateral veins 4–8(–10), or in linear laminas up to 25 pairs, the basal pair up to 1/4–1/3, but in narrow laminas up to 1/8–1/6, and in linear laminas not elongate and up to 1/20–1/10 the length of the lamina, running close to the margin of the lamina and then unbranched but in large leaves mostly branched and/or also other lateral veins branched, lateral veins in narrow leaves departing at angles up to 90° and mostly straight, tertiary venation scalariform or in narrow laminas reticulate; waxy glands in the axils of both basal lateral veins; petiole 0.2–1.5(–3) cm long, slightly different to almost equal in length on the same twig, sparsely minutely hispidulous, the epidermis persistent (or rarely flaking off); stipules semi-amplexicaul, subovate, chartaceous, 0.3–0.8 cm long, sparsely minutely puberulous to glabrous, caducous. *Figs* axillary and also just below the leaves, in pairs or solitary, sessile or with a peduncle up to 0.3 cm long; peduncular bracts 2 or 3, scattered (up to the base of the receptacle) or verticillate, 0.5–1 mm long; receptacle (sub)globose, (0.3–)0.5–1(–1.2) cm diam. when dry, (sparsely) minutely hispidulous, scabrous to scabridulous, mostly without lateral bracts, yellow to red or black at maturity, apex convex, ostiole 1–2 mm diam., often surrounded by a low rim; internal hairs abundant (or few to absent), brownish. *Tepals* whitish, minutely hairy at the apices or glabrous. *Styles* glabrous. — **Map 3.**

Distribution — Taiwan and Malesia; in *Malesia*: Borneo (rare, Sabah: Tawau; Sarawak: Sg. Kapit), Philippines (incl. Palawan), Celebes (rare).

Habitat — Forest and secondary growth, at altitudes up to 1400 m.

Notes — 1. This taxon is very variable and several varieties were distinguished by Corner (1960, 1965). Linear-lanceolate laminas with numerous, more than 8 pairs of

lateral veins (mostly departing at angles of 90°) and large laminas (18–37 by 8–17 cm) are extremes of the variation. Both are not common. The former includes the type of the species (= *F. cumingii* var. *cumingii*) and the latter includes the type of *F. worcesteri* (= *F. cumingii* var. *worcesteri*). The most common form (also occurring in Taiwan) was named *F. cumingii* var. *terminalifolia*.

2. In the narrow-leaved form, the leaves are usually less frequently opposite and tend to be more often arranged in lax spirals than in the broad-leaved forms. Moreover, the basal lateral veins extend up to 1/20–1/10 the length of the lamina and the tertiary venation is reticulate.

3. The narrow-leaved form is also found in Celebes and includes the type collection of *F. ampelas* var. *linearis* and that of *F. fallax*, although it shows traits transitional to the broader-leaved material of the species.

4. The New Guinean collections inserted in *F. cumingii* var. *androbrota* are in the present treatment included in *F. opposita*.

5. *Ficus cumingii* and *F. opposita* are very closely related taxa. Considering the nature of the differentiating characters they could be treated as subspecies. In *F. opposita*, the margin of the lamina is more clearly and consistently revolute than in *F. cumingii*, in which weakly revolute margins are almost confined to subcoriaceous laminas. In *F. opposita*, the waxy glands are often (extended) to the midrib and often fused, whereas they are usually clearly confined to the axils of the basal lateral veins in *F. cumingii*. In *F. opposita*, lateral veins others than the basal ones are often branched or furcate, whereas rarely (and only in large leaves) in *F. cumingii*. The apex of the lamina is short-acuminate to rounded in *F. opposita*, whereas more longly acuminate to subcaudate in *F. cumingii*. In *F. opposita,* the fig peduncles are usually longer than 0.4 cm. The patterns of variation are different in the two taxa. These differences and disjunct occurrence are reasonable arguments to keep the taxa as distinct at the species level, at least provisionally.

9. **Ficus elmeri** Merr.

Ficus elmeri Merr., Publ. Gov. Lab. Philipp. 29 (1905) 9; Elmer, Leafl. Philipp. Bot. 1 (1906) 55; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 51; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 278; Corner, Gard. Bull. Singapore 17 (1960) 465; 21 (1965) 69.

Ficus semicordata Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 226, 293, non Sm. in Rees 1810; King, Sp. Ficus 2 (1888) 79, t. 97; Koord., Minah. (1898) 607; K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 276; Diels, Bot. Jahrb. Syst. 67 (1935) 203.

Ficus subintegra (Merr.) Elmer, Leafl. Philipp. Bot. 1 (1906) 56; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 66; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 277. — *Ficus elmeri* Merr. var. *subintegra* Merr., Publ. Gov. Lab. Philipp. 29 (1905) 10.

Ficus kamelii Merr. ex Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 276; Elmer, Leafl. Philipp. Bot. 9 (1937) 3487.

Shrub or tree up to 12 m tall. *Branchlets* often drying dark red-brown. *Leafy twigs* 2–6 mm thick, minutely whitish hispidulous to puberulous, ± scabrous or smooth; internodes solid. *Leaves* distichous; lamina ovate to subovate to elliptic to oblong, 5–20(–32) by 3–10(–14) cm, strongly asymmetric, subcoriaceous to chartaceous, apex acuminate, base strongly inequilateral, at the broad side cordate to subcordate with

the lobe sometimes covering the petiole, at the narrow side cordate to cuneate, margin irregularly crenate dent(icul)ate to subentire, ± revolute; upper surface hispidulous, scabrous, lower surface rather densely to sparsely whitish puberulous to subhispidulous to minutely hispidulous on the veins, ± scabrous; cystoliths on both sides; lateral veins (4–)6–10 pairs, the basal pair up to 1/3–1/2 the length of the lamina, (at least) the basal lateral veins at the broad side branched, usually also several other lateral veins branched or furcate, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins, and at the broad side of the lamina also in the axil of the lateral vein below the main basal one, these two glands often extended to the middle of the midrib and fused, the gland in the axil of the basal vein at the narrow side often inconspicuous; petiole 0.5–1.5(–2) cm long, slightly different to almost equal in length on the same twig, (minutely) whitish hispidulous to puberulous, the epidermis persistent; stipules amplexicaul, 0.4–1(–1.2) cm long, minutely (appressed-)puberulous, often only on the keel and ciliolate, caducous. *Figs* axillary or just below the leaves, solitary or paired, or ramiflorous to cauliflorous, on (clusters of) up to 1 cm long branches with short internodes; peduncle 0.5–1(–2) cm long; peduncular bracts 3, scattered, 2 subopposite, or 3 verticillate, c. 1 mm long, only ciliolate; receptacle subglobose, 0.8–1.5 cm diam. when dry, densely whitish puberulous to sparsely hispidulous, smooth to scabridulous, without lateral bracts, yellow to red at maturity, apex convex, ostiole c. 4 mm diam., the apical and outer ostiolar bracts pointing upwards, constituting a small rosette; internal hairs abundant to few. *Tepals* dark red, glabrous. *Styles* glabrous.

Distribution — Philippines (Luzon, Polillo, Cebu, Bohol, Samar) and Celebes (northern and western).

Habitat — Forest, at altitudes up to 1500 m.

Uses — In cultivation because of the good taste of the figs.

Notes — 1. This species is very similar to *F. odorata* in the general aspects of the leaves. Moreover, both have red ovaries, which is unusual in the subgenus. These partly allopatric species can be distinguished by the stipules, being fully amplexicaul in *F. elmeri*, but semi-amplexicaul in *F. odorata*, and by the lobes at the broad side of the lamina, usually covering the petiole in *F. odorata*, but not so in *F. elmeri*. Moreover, the leafy twigs and petioles are puberulous to hispidulous in *F. elmeri*, but mostly hirtellous in *F. odorata*. The peduncular bracts are glabrous outside but conspicuously ciliolate in *F. elmeri*, but hairy outside in *F. odorata*.

2. The species appears to have its figs predominantly axillary in the Philippines, but (only?) cauliflorous in Celebes.

10. **Ficus erinobotrya** Corner

Ficus erinobotrya Corner, Gard. Bull. Singapore 17 (1960) 469; 21 (1965) 70; Philos. Trans., Ser. B, 253 (1967) 108, t. 34.

Shrub or tree up to 8 m tall. *Branchlets* often drying red-brown. *Leafy twigs* 3–4 mm thick, whitish to yellowish puberulous to hirtellous, smooth; internodes hollow. *Leaves* distichous; lamina (sub)ovate to elliptic to oblong, 12–26(–36) by 6–12(–17) cm, strongly asymmetric, chartaceous, apex acuminate to caudate, base inequilateral, the broad side cordate with the lobe covering the petiole, the narrow side subcordate to

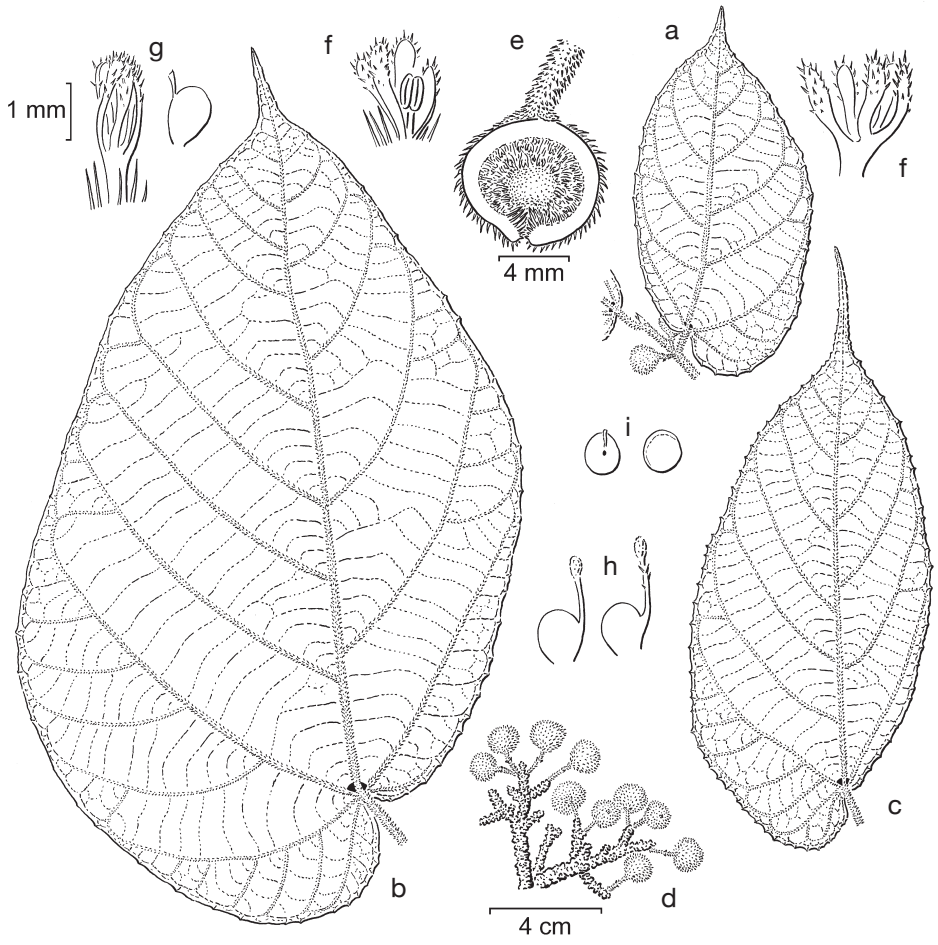


Fig. 41. *Ficus erinobotrya* Corner. a. Leafy twig with fig; b, c. leaves; d. fig-bearing branchlets; e. fig; f. staminate flowers; g. short-styled flower and pistil; h. long-styled pistils; i: fruits (a, e–g: *Kajewski 2364*; b: *RSS 2451*; c, d, h, i: *RSS 166*). From Philos. Trans., Ser. B, 253 (1967) 109.

subcuneate, margin irregularly crenate-denticulate to subentire; upper surface hispidulous, on the main veins to puberulous, scabrous, lower surface whitish puberulous to hirtellous, smooth; cystoliths on both sides; lateral veins 8–10 pairs, the basal pair up to 1/3–1/2 the length of the lamina, at the broad side of the lamina branched, sometimes also some other lateral veins at that side branched or furcate, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins and on the broad side of the lamina also in the axils of the lateral veins below the major basal one; petiole 0.5–1 cm long, slightly different to almost equal in length on the same twig, puberulous to hirtellous, the epidermis persistent; stipules semi-amplexicaul, 0.7–1 cm long, puberulous, caducous. *Figs* axillary, solitary, or ramiflorous to cauliflorous, on up to 12 cm long leafless branchlets with short internodes; peduncle 0.4–1 cm long; peduncular bracts

1 or 2, scattered, c. 0.5–1 mm long; receptacle (sub)globose, 0.7–1 cm diam. when dry, 1–1.5 cm diam. when fresh, brownish to whitish puberulous to subhispidulous, smooth, mostly with few lateral bracts, orange to red at maturity, apex convex, ostiole 1.5–2 mm diam.; internal hairs abundant, brownish. *Tepals* red to whitish, glabrous or hairy at the apices. *Styles* glabrous. — **Fig. 41.**

Distribution — New Guinea (New Britain and New Ireland) extending to the Solomon Islands.

Habitat — Forest and secondary growth, at low altitudes.

Notes — 1. This species can be easily recognized by the strongly asymmetric base of the lamina, the lobe of the broad side covering the petiole and by the presence of an additional waxy gland in the axil of the lateral vein below the major one at the broad side of the lamina, like in *F. elmeri, F. fiskei,* and *F. odorata* from the Philippines.

2. The material from the Solomon Islands differs slightly from the material from New Britain, as in a less strongly asymmetric base of the lamina, the somewhat longer petioles, and/or sparser indument (var. *solomonensis* Corner with a forma *glabrior* Corner).

3. This species shows affinities to *F. gryllus* Corner (Gard. Bull. Singapore 17 (1960) 468; Philos. Trans., Ser. B, 253 (1967) 106) from the Solomon Islands.

11. Ficus eustephana Diels

Ficus eustephana Diels, Bot. Jahrb. Syst. 67 (1935) 199; Corner, Gard. Bull. Singapore 21 (1965) 63.

Shrub c. 1 m tall. *Leafy twigs* 2–4 mm thick, dark brown hirtellous (to strigillose), conspicuous lenticels just below the (scars of the) stipules; internodes solid. *Leaves* spirally arranged; lamina oblong, 6–14 by 3–5.5 cm, (almost) symmetric, chartaceous, apex acuminate, base rounded, margin denticulate; upper surface hirtellous to subhispidulous, scabrous, lower surface (dark) brown hirtellous to strig(ill)ose, ± scabrous; cystoliths only beneath; lateral veins 5 or 6 pairs, the basal pair up to 1/3–1/2 the length of the lamina, (faintly) branched, other lateral veins sometimes branched or furcate, tertiary venation scalariform; waxy glands absent; petiole 1–5.5 cm long, usually distinctly different in length on the same twig, (dark) brown hirtellous, the epidermis ± flaking off; stipules semi-amplexicaul, (0.5–)1–1.8 cm long, brown to whitish strigillose, largely on and along the midrib, caducous or subpersistent. *Figs* just below the leaves, solitary (or also cauliflorous?); peduncle 0.8–1.7 cm long; peduncular bracts, mostly 3 or 4, ± scattered, 1–5 mm long; receptacle subglobose, 1.3–1.8 cm diam. when dry, brown setulose (with the hairs irritant?), with numerous up to 15 mm long, lanceolate and coriaceous lateral bracts, colour at maturity unknown, apex ± convex, ostiole c. 3 mm diam., surrounded by a rosette of up to 4 mm long apical bracts, pointing upwards; internal hairs abundant. *Tepals* dark red, glabrous. *Styles* glabrous.

Distribution — New Guinea (north-eastern).

Habitat — Mossy forest, at 2050–2100 m.

Note — This species is closely related to *F. complexa*, being distinct in the smaller leaves with a rounded base, shorter indumentum, and shorter stipules. It is only known from the type collection, and this might be a specimen of *F. complexa* in a poor state.

12. **Ficus fiskei** Elmer

Ficus fiskei Elmer, Leafl. Philipp. Bot. 1 (1906) 195; 2 (1908) 540; Merr., Philipp. J. Sci. 18 (1921) 68; Enum. Philipp. Flow. Pl. 2 (1923) 52; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 280; Corner, Gard. Bull. Singapore 21 (1965) 67.
Ficus hemicardia Merr., Philipp. J. Sci., Bot. 9 (1914) 275; Enum. Philipp. Flow. Pl. 2 (1923) 54; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 279.
Ficus fiskei Elmer var. *cebuensis* Merr., Philipp. J. Sci. 18 (1921) 68; Enum. Philipp. Flow. Pl. 2 (1923) 52; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 281.
Ficus fiskei Elmer var. *laevifolia* Merr., Philipp. J. Sci. 18 (1921) 69; Elmer, Leafl. Philipp. Bot. 7 (1914) 2405 (as *F. fiskei*); Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 281.
Ficus hemicardia Merr. var. *curvata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 280.
Ficus hemicardia Merr. var. *grandifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 280.
Ficus fiskei Elmer var. *multinervia* Corner, Gard. Bull. Singapore 17 (1960) 459.

Shrub or tree up to 5(–8) m tall. *Branchlets* often drying red-brown. *Leafy twigs* 2–5 mm thick, coarsely hispidulous, the hairs with strongly swollen bases, scabrous; internodes hollow. *Leaves* distichous; lamina oblong to elliptic to subovate or to lanceolate, (5–)10–25(–36) by 3–10(–14) cm, mostly strongly asymmetric (sometimes almost symmetric), subcoriaceous, apex acuminate, base strongly inequilateral, at the broad side cordate with the lobe mostly covering the petiole, at the narrow side cuneate to subcordate (or in almost symmetric laminas both sides cordate), margin irregularly denticulate to lobate or subentire; upper surface (sparsely) hispidulous, scabrous to scabridulous, often ± bullate, lower surface sparsely hispidulous on the (main) veins, scabrous; cystoliths on both sides; lateral veins 5–8(–11) pairs, the basal pair to 1/4–1/3(–1/2) the length of the lamina, (at least) at the broad side branched, tertiary venation (laxly) scalariform; waxy glands in the axils of both basal lateral veins, and at the broad side of the lamina also in the axil of the lateral vein below the main basal one; petiole 0.3–1(–1.5) cm long, slightly different to almost equal in length on the same twig, sparsely and coarsely hispidulous, the hairs with strongly swollen bases, the epidermis persistent; stipules semi-amplexicaul, 0.5–1(–1.2) cm long, (minutely) puberulous on the keel, caducous. *Figs* axillary, solitary or in pairs, or ramiflorous to cauliflorous, on up to 1 cm long leafless branches with short internodes; peduncle 0.4–1 cm long; peduncular bracts 2 or 3, mostly scattered, 0.5–1 mm long; receptacle subglobose, 0.8–1.8 cm diam. when dry, sparsely hispidulous to glabrous, ± scabrous to smooth, without lateral bracts, yellow to red at maturity, apex convex, ostiole c. 3 mm diam.; internal hairs few or absent. *Tepals* pinkish to whitish, glabrous. *Styles* glabrous.

Distribution — Philippines (widespread, not in Palawan?).

Habitat — Forest (in rocky places), at altitudes up to c. 1300 m.

Note — The species is rather variable and several varieties were distinguished (by Merrill 1921; Sata 1944; and Corner 1960).

13. **Ficus floresana** C.C. Berg

Ficus floresana C.C. Berg, Blumea 48 (2003) 576.

Tree (medium-sized?). *Leafy twigs* 1.5–2.5 mm thick, very sparsely whitish minutely subhispidulous to (sub)glabrous, smooth; internodes solid or hollow. *Leaves* in lax spi-

rals, sometimes (sub)opposite; lamina oblong, 7–12.5 by 2.5–4.5 cm, slightly asymmetric or to almost symmetric, subcoriaceous, apex acuminate to subacute, base rounded to cuneate, margin entire, flat; both surfaces glabrous, smooth; cystoliths on both sides; lateral veins 6–8(–9) pairs, the basal pair running close to the margin, unbranched, up to 1/5–1/3 the length of the lamina, unbranched, the other lateral veins sometimes furcate, tertiary venation subscalariform to reticulate; waxy glands in the axils of both basal lateral veins; petiole 0.8–4.5 cm long, clearly different to almost equal in length on the same twig, (very) sparsely puberulous to glabrous, the epidermis flaking off; stipules lateral to semi-amplexicaul, subovate, chartaceous, c. 0.5 cm long, ciliolate, caducous. *Figs* axillary, solitary; peduncle 0.8–2.3 cm long; peduncular bracts 2 or 3, scattered, 0.5 mm long; receptacle (sub)globose to ellipsoid, 0.5–1.3 cm diam. when dry, sparsely hispidulous or glabrous, scabridulous or smooth, with few 0.5–1 mm long lateral bracts or none, colour at maturity unknown, apex ± convex to umbonate, ostiole 1.5–2.5 mm diam., ± sunken or surrounded by a low rim; internal hairs minute, few. *Tepals* red (dark brown when dry), (sparsely) hairy at the apices. *Styles* sparsely hairy.

Distribution — Lesser Sunda Islands (Flores).

Habitat — Monsoon forest, at altitudes up to 1660 m.

Note — Some collections of this species have been identified by Corner as *F. leptoclada* Benth. from Australia. But they certainly do not belong to that species and they could not be accommodated in any other species. Considering similarities of the flowers, this species is related to *F. balica*, from which it differs in the smaller laminas with a rounded to cuneate bases.

14. Ficus goniophylla Corner

Ficus goniophylla Corner, Gard. Bull. Singapore 17 (1960) 461; 21 (1965) 68.

Tree up to 10 m tall. *Branchlets* drying dark brown. *Leafy twigs* 1.5–2.5 mm thick, ± sparsely whitish hispidulous, scabrous; internodes hollow. *Leaves* distichous; lamina obliquely rhombic, 3–13 by 2–5.5 cm, asymmetric, chartaceous, apex acute, base slightly inequilateral, cuneate to obtuse, margin with (1 or) 2 blunt angles or lobes; upper surface hispidulous, scabrous, lower surface whitish hispidulous, mainly on the veins, scabrous; cystoliths only beneath; lateral veins 3 or 4 (or 5) pairs, the basal pair running more or less closely to the margin, up to 1/4–1/3 the length of the lamina, unbranched or faintly branched, the other lateral veins departing the midrib at angles of about 90°, mostly furcate, tertiary venation laxly reticulate; waxy glands in the axils of both basal lateral veins; petiole 0.2–0.4 cm long, slightly different to almost equal in length on the same twig, whitish hispidulous, the epidermis persistent; stipules semi-amplexicaul, 0.2–0.3 cm long, sparsely hispidulous, caducous. *Figs* axillary or just below the leaves, solitary or in pairs, or cauliflorous; peduncle 1–3 cm long, broadening towards the apex; peduncular bracts 2 or 3, scattered, c. 1 mm long; receptacle obovoid, 1–2 cm diam. when dry, the surface ± warty, rather densely puberulous to subhispidulous and scabridulous to smooth or coarsely hispidulous with hairs with swollen bases, with several swollen lateral bracts, scattered or concentrated in the upper part of the receptacle, sometimes developing into irregular up to 3 mm long processes, colour at maturity

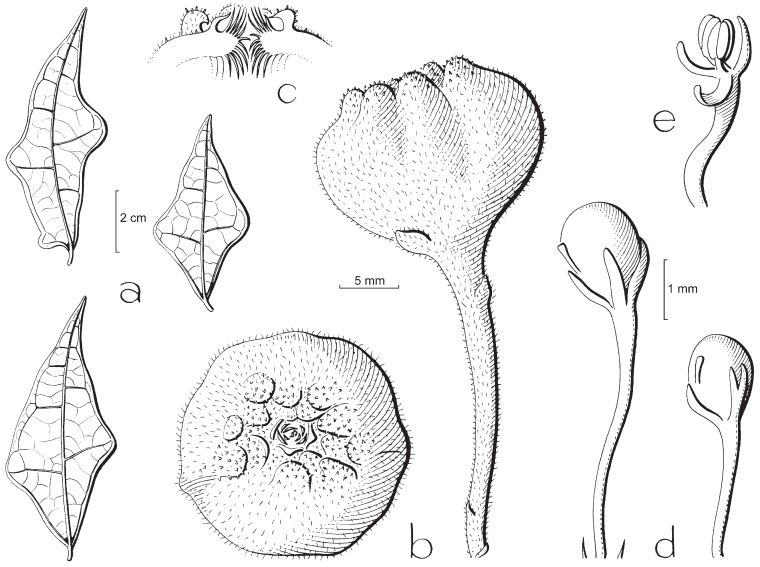


Fig. 42. *Ficus goniophylla* Corner. a. Leaves; b. figs; c. ostiole; d. short-styled flowers; e. staminate flower (all: *Kjellberg 1925*).

unknown, apex convex to flat, ostiole c. 5 mm diam., surrounded by swollen apical bracts; internal hairs sparse. *Tepals* whitish, glabrous. *Styles* glabrous. — **Fig. 42.**

Distribution — Celebes (south-western: near Todjamboe; and southern: near Polewali).

Habitat — Forest, at altitudes up to 1200 m.

Notes — 1. This species is characterized by the obliquely rhombic laminas, resembling those material of *F. anastomosans* from Thailand.

2. The two collections of the species are different in position and surface of the receptacle of the figs. The type is cauliflorous and the fig receptacle bears rather soft hairs and swollen lateral bracts mainly in the upper part of the receptacle. The other collection has the figs in the leaf axils or just below the leaves and the fig receptacle bears very rigid hairs with swollen bases and scattered processes, apparently representing lateral bracts.

15. **Ficus gul** Lauterb. & K. Schum.

Ficus gul Lauterb. & K. Schum., Fl. Schutzgeb. Südsee (1901) 278; Diels, Bot. Jahrb. Syst. 67 (1935) 207; Corner, Gard. Bull. Singapore 17 (1960) 452; 21 (1965) 63; Philos. Trans., Ser. B, 253 (1967) 91, t. 24; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 280.

Ficus rudis Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 222, 291, non Pers. 1807; King, Sp. Ficus 2 (1888) 85, t. 108; Koord., Minah. (1898) 607; Elmer, Leafl. Philipp. Bot. 1 (1906) 54; Merr., Enum. Born. (1921) 227; Enum. Philipp. Flow. Pl. 2 (1923) 64; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 264; Corner, Gard. Bull. Singapore 21 (1965) 63; Philos. Trans., Ser. B, 253 (1967) 91, f. 24.

Ficus keyensis K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 270; Diels, Bot. Jahrb. Syst. 67 (1935) 206.

Ficus manilensis Warb., Fragm. Fl. Philipp. 3 (1905) 199; Elmer, Leafl. Philipp. Bot. 1 (1907) 250; 4 (1911) 1255; 7 (1914) 2404; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 56; Elmer, Leafl. Philipp. Bot. 9 (1939) 3485; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 265.
Ficus rudis Miq. var. *arborea* Elmer, Leafl. Philipp. Bot. 1 (1906) 54.
Ficus subconcolor Diels, Bot. Jahrb. Syst. 67 (1935) 199.
Ficus bismarckiana Diels, Bot. Jahrb. Syst. 67 (1935) 206; Summerh., J. Arnold Arbor. 22 (1941) 95.
Ficus manilensis Warb. var. *lata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 265 (leaves of young trees).
Ficus manilensis Warb. var. *obovata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 266 (leaves of old trees).
Ficus gul Lauterb. & K. Schum. var. *lasiocarpa* Corner, Gard. Bull. Singapore 17 (1960) 452.
Ficus gul Lauterb. & K. Schum. var. *solomonensis* Corner, Gard. Bull. Singapore 17 (1960) 452; 18 (1961) 87, f. 3.
Ficus griseifolia Corner, Gard. Bull. Singapore 17 (1960) 456; 21 (1965) 65.
Ficus gul Lauterb. & K. Schum. var. *eubracteata* Corner, Gard. Bull. Singapore 18 (1961) 87, f. 3.

Tree up to 25 m tall. *Leafy twigs* 2–4 mm thick, white to brownish puberulous to whitish to dark brown hirtellous to subhirsute or whitish hispidulous to appressed-puberulous (to subglabrous), with conspicuous lenticels just below the (scars of the) stipules; internodes solid. *Leaves* spirally arranged; lamina oblong to elliptic to subobovate or to (sub)ovate (to subcordiform or to suborbicular), (3–)7–24 by (2–)3–12 cm, (almost) symmetric, sometimes asymmetric, chartaceous, apex acuminate, base cordate to subcordate (to truncate to rounded), margin regularly ± irregularly denticulate, sometimes revolute; upper surface puberulous to hirtellous to hispidulous to strigillose, scabrous, lower surface (dark) brown hirtellous to subhirsute or (to) whitish puberulous to hispidulous on the (main) veins, scabridulous or smooth; cystoliths only beneath; lateral veins (4–)5–9 pairs, the basal pair up to 1/4(–1/3) the length of the lamina, these and other lower lateral veins mostly branched or furcate, tertiary venation scalariform; waxy glands largely on the midrib, below the axils of the (main) basal lateral veins, sometimes also below the axils of other lateral veins; petiole 0.5–8(–12) cm long, varying distinctly to slightly in length on the same twig, (dark) brown hirtellous to subhirsute or whitish puberulous to hispidulous, the epidermis persistent or ± flaking off; stipules semi-amplexicaul, 0.4–0.9 cm long, sparsely (to rather densely) white appressed-puberulous to brown strigillose to subglabrous, caducous. *Figs* axillary, in pairs or solitary, or ramiflorous to cauliflorous, on (clusters of) up to 3 cm long (tuberculate) short-shoots (down to the trunk); peduncle 0.3–1.2(–2) cm long; peduncular bracts, mostly 2 or 3, scattered, 0.5–1.5(–3) mm long; receptacle subglobose (to ellipsoid), 0.3–0.8(–1.2) cm diam. when dry, brownish to whitish puberulous to hirtellous or to hispidulous, the rigid hairs with a swollen base (or whitish subvillous), occasionally glabrous, usually with some up to 1 or up to 3 mm long lateral bracts, red-purple at maturity, apex ± convex, ostiole c. 1 mm diam., surrounded by short apical bracts ± covering the ostiole or pointing upwards; internal hairs abundant to sparse. *Tepals* dark red, glabrous. *Styles* glabrous.

Distribution — From Borneo to the Solomon Islands; in *Malesia*: Borneo (northern and eastern), Philippines (except Palawan?), Celebes, Lesser Sunda Islands (Flores), Moluccas (Talaud Islands, Halmahera, Buru, Ceram, Tanimbar Islands, Key Islands), New Guinea (incl. Admiralty Islands and New Britain).

Habitat — Forest and secondary growth, at altitudes up to 1500(–2000) m.

Notes — 1. The species is quite variable as with regard to the shape of the lamina, the length, colour and rigidity of the indumentum, and the dimensions of the fig receptacles. The figs are born axillary and in clusters on the lesser branches, but may occur down to the trunk in New Guinea (and the Solomon Islands).

2. The indumentum on the leafy twigs, the petiole, the lower surface of the lamina, and the fig receptacle varies from dark brown hirtellous to subhirsute to whitish hispidulous; some collections only have the latter type of indumentum. The hairs on the figs are soft (whitish subvillous) in some collections from eastern New Guinea.

3. Several collections from eastern New Guinea (and the Solomon Islands) have relatively large fig receptacles, 0.8–1.2 cm diam. when dry, whereas in most collections the receptacles are 0.5–0.8 cm diam. when dry.

4. The epidermis of the petioles is usually persistent, but it is slightly to clearly flaking off in several collections, in particular from eastern New Guinea, including the material described as *F. griseifolia*.

5. In the Solomon Islands, the tepals and pedicels are shortly hairy at the apex, a feature leading to recognition of a distinct variety, var. *solomonensis*.

6. The species is usually found at altitudes below 1500 m, but in Papua New Guinea (Milne Bay Prov.) it has been collected at altitudes up to c. 2000 in montane forest.

16. Ficus heterophylla L.f.

Ficus heterophylla L.f., Suppl. Pl. (1782) 442; Vahl, Enum. Pl. 2 (1805) 203; Roxb., Fl. Ind., ed. Carey 3 (1832) 531; Wight, Ic. 2 (1843) t. 659; Miq., London J. Bot. 7 (1848) 231; Fl. Ind. Bat. 1, 2 (1859) 297; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 271, 291; King, Sp. Ficus 2 (1888) 75, t. 94; Fl. Brit. India 5 (1888) 518; Watt, Dict. Econ. Prod. India 3 (1890) 353; Trimen, Fl. Ceyl. 4 (1898) 93; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 461; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 188; Renner, Bot. Jahrb. Syst. 39 (1907) 395; Talbot, For. Fl. Bomb. 2 (1911) 521; Ridl., Fl. Malay Penins. 3 (1924) 339; Gagnep., Fl. Indo-Chine 5 (1928) 775; Backer & Bakh.f., Fl. Java 2 (1965) 26; Corner, Gard. Bull. Singapore 21 (1965) 73; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 150, t. 24; Kochummen, Tree Fl. Malaya 3 (1978)148.

Ficus cannabina Lour., Fl. Coch. 2 (1790) 668; Miq., London J. Bot. 7 (1848) 227; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290.

?*Ficus politoria* Lour., Fl. Coch. 2 (1790) 667, non Lam., 1788.

Ficus denticulata Vahl, Symb. Bot. 1 (1790) 83; Enum. Pl. 2 (1805) 202; Blume, Bijdr. (1825) 472; Buch.-Ham., Trans. Linn. Soc. 15 (1826) 144.

Ficus truncata Vahl, Symb. Bot. 1 (1790) 83; Enum. Pl. 2 (1805) 201; Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 21; Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 254.

Ficus rufescens Vahl, Enum. Pl. 2 (1805) 203.

Ficus aquatica J. König ex Willd., Sp. Pl. 4 (1806) 1133.

Ficus biglandula Blume, Bijdr. (1825) 475; Miq. in Zoll., Syst. Verz. 2 (1854) 93, '*biglandulosa*'; Fl. Ind. Bat. 1, 2 (1859) 298.

Ficus scabrella Roxb., Fl. Ind., ed. Carey 3 (1832) 532; Wight, Ic. Pl. Ind. Orient. 2 (1843) t. 661; Miq., London J. Bot. 7 (1848) 229; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; Kurz, Forest Fl. Burma 2 (1877) 455; King, Fl. Brit. India 5 (1888) 519. — *Ficus heterophylla* L.f. var. *scabrella* (Roxb.) King, Sp. Ficus 2 (1888) 76, t. 94, f. 3, 4.

Ficus acutiloba Miq., London J. Bot. 7 (1848) 227, t. 5A; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290.

Ficus elongata Miq., London J. Bot. 7 (1848) 231. — *Ficus heterophylla* L.f. var. *elongata* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 271, 291.

Ficus subpanduriformis Miq., London J. Bot. 7 (1848) 235; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292. — *Ficus grossularioides* Burm.f. var. *subpanduriformis* (Miq.) Kuntze, Rev. Gen. Pl. 1 (1891) 626.

Shrub up 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, ± strongly asymmetric or to almost symmetric, 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 up to 1/6–1/3 the length of the lamina, if running close to the margin of the lamina then unbranched, 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 0.3–1.2 cm long; peduncular bracts 3, verticillate, subtending the receptacle or far below (and then the receptacle apparently stipitate), 0.5–1 mm long; receptacle (sub)globose to ellipsoid, 0.8–1.5 cm diam. when dry, minutely hispidulous, ± scabrous, without lateral bracts, orange to dark red at maturity, apex convex to slightly umbonate, ostiole c. 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.

Distribution — From Sri Lanka, India, and Myanmar to China (Guangdong, Hainan), Indochina, Thailand and Malesia; in *Malesia*: Malay Peninsula, Java, Borneo (southern and eastern).

Habitat — Open places, in particular flood-margins of rivers, at low altitudes.

Note — Material from the Asian mainland included in var. *assamica* (Miq.) Corner (Gard. Bull. Singapore 21 (1965) 73) belongs to a distinct species for which the name *F. repens* Roxb. ex Willd. is to be applied.

17. Ficus heteropoda Miq.

Ficus heteropoda Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 232, 296; King, Sp. Ficus 2 (1888) 78, t. 96; Elmer, Leafl. Philipp. Bot. 1 (1906) 193; 2 (1908) 543; 4 (1911) 1321; 4 (1912) 1377; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 54; Elmer, Leafl. Philipp. Bot. 9 (1937) 3445; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 275; Corner, Gard. Bull. Singapore 21 (1965) 65.

Ficus decussata Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 198.

Ficus anomala Merr., Philipp. J. Sci., 1, Suppl. (1906) 183; Elmer, Leafl. Philipp. Bot. 1 (1907) 241; 2 (1908) 535.

Tree up to 20 m tall. *Leafy twigs* 3–8 mm thick, whitish hispidulous to (sub)glabrous, ± scabrous; internodes mostly hollow. *Leaves* (sub)opposite or spirally arranged, pairs on horizontal twigs usually unequal; lamina elliptic to oblong to (sub)ovate (to subcor-

diform), 10–32 by 7–20 cm, symmetric or ± asymmetric, chartaceous, apex acuminate, base cordate to rounded, margin crenate-dentate to subentire; upper surface hispidulous, scabrous, lower surface sparsely to densely whitish (sub)hispidulous on the veins, scabrous; cystoliths on both sides; lateral veins 5–10 pairs, the basal pair up to 1/3–1/2 the length of the lamina, these and also some of the lower lateral veins branched or furcate, tertiary venation (laxly) scalariform; waxy glands in the axils of both basal lateral veins or also smaller ones in the axils of other lateral veins; petiole 2–9 cm long, varying considerably to slightly in length on the same twig, whitish hispidulous to densely puberulous, the epidermis persistent; stipules semi-amplexicaul, 0.5–1 cm long, sparsely minutely strigillose, caducous (or subpersistent). *Figs* axillary, in pairs or solitary, mostly ramiflorous to cauliflorous, on (clusters of) leafless branchlets with short internodes, down to the trunk; peduncle 1–5 cm long; peduncular bracts 1–3(–4), scattered, c. 1 mm long; receptacle (sub)globose, 0.8–1.5(–2) cm diam. when dry, hispidulous and scabrous or glabrous and smooth, (usually) with few 0.5–1 mm long lateral bracts, yellow to blood-red at maturity, apex ± convex to almost flat, ostiole c. 3 mm diam., surrounded by a low rim; internal hairs few to abundant, whitish to brownish. *Tepals* whitish to reddish, (sparsely) hairy at the apices. *Styles* glabrous. — **Map 5.**

Distribution — Philippines (all islands), Celebes (incl. Sangi Islands), Moluccas (Talaud Islands, Halmahera, Ambon).

Habitat — Forest and secondary growth, at low altitudes.

18. Ficus leptodictya Diels

Ficus leptodictya Diels, Bot. Jahrb. Syst. 67 (1935) 196; Summerh., J. Arnold Arbor. 22 (1941) 90. — *Ficus tonsa* Miq. var. *leptodictya* (Diels) Corner, Gard. Bull. Singapore 17 (1960) 463.

Tree up to 23 m tall. *Branchlets* drying (dark) red-brown, the periderm flaking off conspicuously. *Leafy twigs* 1.5–2 mm thick, glabrous, smooth; internodes solid. *Leaves* in lax spirals to distichous, drying greenish; lamina oblong to elliptic, 6–14(–20) by 5–6(–8.5) cm, slightly asymmetric to almost symmetric, subcoriaceous, apex subacuminate to subacute, base almost equilateral, cuneate to obtuse (to rounded), margin (sub)entire, flat; upper surface glabrous, scabridulous to smooth, lower surface glabrous, smooth; cystoliths on both sides; midrib flat at the base, lateral veins 7–9 pairs, the basal pair up to 1/4–1/3(–1/2) the length of the lamina, if running close to the margin of the lamina then unbranched, if at some distance, then (faintly) branched, other lateral veins sometimes furcate, tertiary venation ± laxly scalariform; waxy glands in the axils of both basal lateral veins; petiole (0.7–)1–1.5 cm long, slightly different to almost equal in length on the same twig, glabrous, the epidermis persistent; stipules semi-amplexicaul, 0.3–0.4 cm long, glabrous or ciliolate, caducous. *Figs* just below the leaves, solitary or in pairs; peduncle 0.5–1.2 cm long; peduncular bracts 2 or 3, scattered, 2 subopposite or 3 verticillate, subtending the receptacle or not, c. 1 mm long; receptacle (sub)globose to ellipsoid, 0.9–1.2 cm diam. when dry, glabrous, punctate, smooth, without lateral bracts, yellow to orange at maturity, apex convex to slightly umbonate, ostiole c. 1.5 mm diam., surrounded by a low rim; internal hairs abundant. *Tepals* dark to pale red, glabrous. *Styles* hairy or glabrous. *Fruits* ± tuberculate.

Distribution — New Guinea (eastern).

Habitat — Forest, at altitudes between 500 and 2000 m.

Notes — 1. This species has been included in *F. tonsa* by Corner (1960), probably largely because the two species here recognized are glabrous, a feature uncommon in the sect. *Sycidium*. Although the differences are rather small, as in the venation, the apex and the margin of the lamina, the colour of dried laminas, and the exfoliation of the periderm of the branchlets, the clearly disjunct distribution of these two taxa justifies recognition at the species level, rather than at an infraspecific one.

2. This species resembles large-leaved specimens of *F. ampelas*, from which it differs in the figs with a larger receptacle, a longer peduncle, and situated only (just) below the leaves.

19. Ficus leptogramma Corner

Ficus leptogramma Corner, Gard. Bull. Singapore 17 (1960) 473; 21 (1965) 73; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 284.

Tree up to 20 m tall, branches spreading and twigs drooping. *Branchlets* drying grey to greenish. *Leafy twigs* (1–)2–3 mm thick, glabrous, smooth, thick, finely ribbed; internodes solid. *Leaves* distichous; lamina elliptic to subovate, 9–20(–35) by 2.5–8(–14) cm, (almost) symmetric, chartaceous, apex caudate, base (almost) equilateral, cuneate (to rounded), margin dentate (to sublobate), flat or ± revolute towards the base; upper surface glabrous, smooth, lower surface very sparsely hispidulous, scabridulous to smooth; cystoliths on both sides, sparse above; midrib prominent above, lateral veins 8–10(–13) pairs, the basal pair up to 1/10–1/8 the length of the lamina, close to the margin, unbranched, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins; petiole (0.3–)1–2 cm long, glabrous, the epidermis caducous; stipules amplexicaul, 1–1.5 cm long, finely striate, glabrous, caducous, the terminal bud stiff and subaculeate. *Figs* cauliflorous, on clusters of up to 4 cm long leafless branchlets with short internodes on the trunk; peduncle 1–2.5 cm long; peduncular bracts 3 or 4, scattered, c. 0.5–1 mm long; receptacle (sub)globose, 0.8–1.2 cm diam. when dry, 1.5–2 cm diam. when fresh, very sparsely minutely puberulous to hispidulous, smooth, with 1–6 lateral bracts, 1–2 mm long, red at maturity,

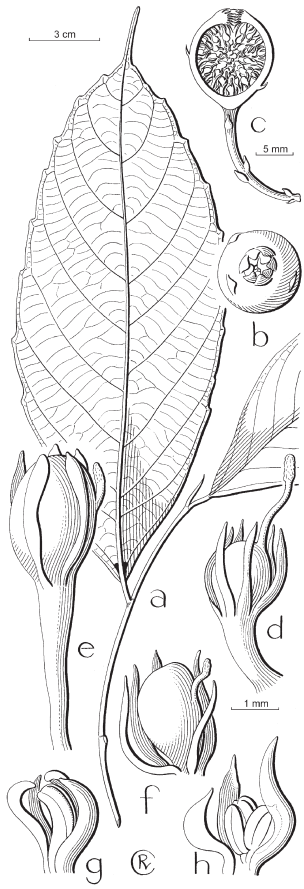


Fig. 43. *Ficus leptogramma* Corner. a. Leafy twig; b, c. figs; d. long-styled flower; e, f. short-styled flowers; g, h. staminate flowers (a–d: *SF 27328*; e–h: *SF 26754*).

apex convex, ostiole 2.5–3 mm diam., prominent; internal hairs absent. *Tepals* whitish or reddish, glabrous. *Styles* glabrous. — **Fig. 43; Map 4.**

Distribution — Borneo (northern and eastern).

Habitat — Forest, at altitudes up to c. 1300 m.

20. *Ficus macrorrhyncha* Lauterb. & K. Schum.

Ficus macrorrhyncha Lauterb. & K. Schum., Fl. Schutzgeb. Südsee (1901) 277; Summerh., J. Arnold Arbor. 22 (1941) 91; Corner, Gard. Bull. Singapore 21 (1965) 68.

Ficus stenorrhyncha Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 245; Diels, Bot. Jahrb. Syst. 67 (1935) 198.

Ficus celebica auct. non Blume: Diels, Bot. Jahrb. Syst. 67 (1935) 198.

Tree up to 10 m tall or shrub. *Branchlets* often drying red-brown. *Leafy twigs* 1–3 mm thick, ± densely pale brown to yellowish puberulous to subtomentose to subvelutinous or densely to sparsely yellowish appressed-puberulous to subsericeous, smooth or scabridulous; internodes solid. *Leaves* distichous; lamina subovate to elliptic (to lanceolate), (3–)10–20(–26) by (1–)2–7(–9) cm, mostly slightly asymmetric to almost symmetric, subcoriaceous to chartaceous, apex acuminate to caudate, base cuneate to rounded, margin irregularly crenate-dent(icul)ate to subentire, ± revolute; upper surface sparsely strigillose on the midrib to glabrous, smooth, lower surface ± densely whitish puberulous to subtomentose or densely to sparsely yellowish appressed-puberulous to subsericeous on the veins, smooth; cystoliths only beneath; tertiary and smaller veins prominent beneath; lateral veins (4–)6–8 pairs, the basal pair running close to the

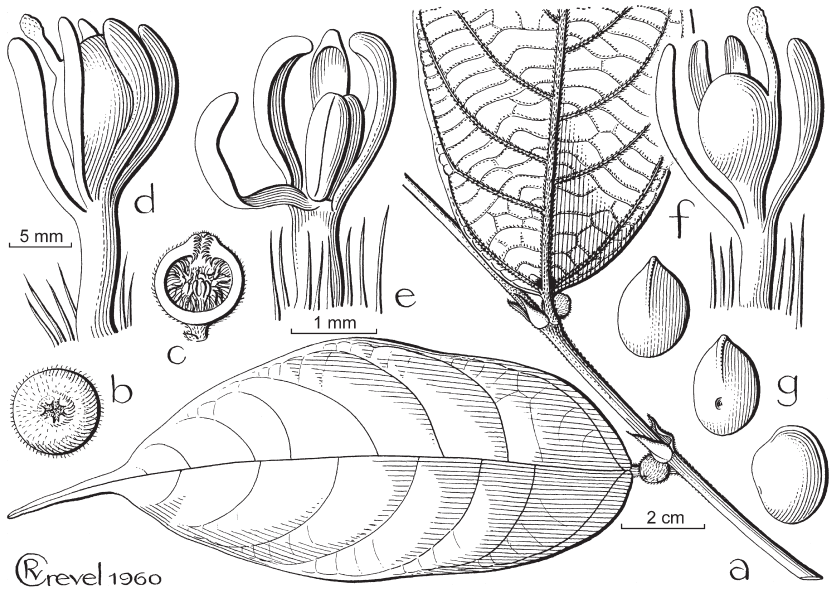


Fig. 44. *Ficus macrorrhyncha* Lauterb. & K. Schum. a. Leafy twig with figs; b, c. figs; d. short-styled flower; e. staminate flower; f. long-styled flower; g. fruits (a–e: *Carr 14742*; f, g: *Carr 15524*).

margin, up to 1/6–1/3(–1/2) the length of the lamina, unbranched, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins; petiole 0.5–1.5 cm long, slightly different to almost equal in length on the same twig, densely whitish hirtellous to subtomentose or densely to sparsely yellowish appressed-puberulous to subsericeous, the epidermis flaking off; stipules semi-amplexicaul, 0.4–1 cm long, (appressed-)puberulous, caducous (or subpersistent). *Figs* axillary or just below the leaves, solitary or paired, or clustered on short-shoots; peduncle 0.1–0.3 cm long; peduncular bracts (2 or) 3, scattered, 2 (sub)opposite or 3 verticillate, 0.5–1 mm long; receptacle (sub)globose, 0.5–1 cm diam. when dry, brownish to yellowish puberulous to subtomentose, smooth, sometimes with a lateral bract, pink to red at maturity, apex convex, ostiole 1–2 mm diam.; internal hairs abundant, brownish, relatively long. *Tepals* red, hairy at the apices. *Styles* glabrous. — **Fig. 44.**

Distribution — New Guinea (mainly eastern, incl. New Britain and New Ireland; also Bird's Head Peninsula).

Habitat — Forest and secondary growth, at altitudes up to 1800 m.

Notes — 1. This species has the prominent venation of the lamina beneath in common with the presumably related *F. quercetorum* and *F. trachypison*. It differs in the exfoliating epidermis of the petiole, the smooth upper surface of the lamina, and both basal lateral veins running close to the margin of the lamina.

2. Two forms can be distinguished: one with patent hairs and the other with appressed hairs in the leafy twigs, the petiole and the lamina beneath. The indumentum may be rather sparse in the latter form and the leafy twigs tend to be thinner.

21. Ficus melinocarpa Blume

Ficus melinocarpa Blume, Bijdr. (1825) 460; Miq., Fl. Ind. Bat. 1, 2 (1859) 302; Fl. Ind. Bat., Suppl. (1861) 427; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273, 292; King, Sp. Ficus 2 (1888) 94, t. 119; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 159; Koord., Atlas Baumart. Java 4 (1918) t. 755; Backer, Blumea 6 (1948) 308; Backer & Bakh.f., Fl. Java 2 (1965) 30; Corner, Gard. Bull. Singapore 21 (1965) 68; Philos. Trans., Ser. B, 253 (1967) 95, t. 26; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 287.

Pogonotrophe alnifolia Miq., Pl. Jungh. (1851) 51; Fl. Ind. Bat. 1, 2 (1859) 330. — *Ficus alnifolia* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278, 293.

Ficus obliqua Miq. in Zoll., Syst. Verz. 2 (1854) 92, 98, non G. Forst 1786; Fl. Ind. Bat. 1, 2 (1859) 300.

Ficus melinocarpa Blume forma *glabrior* Miq., Fl. Ind. Bat., Suppl. (1861) 427.

Ficus haggeri Merr., Philipp. J. Sci. 18 (1921) 62; Enum. Philipp. Flow. Pl. 2 (1923) 53; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 360.

Ficus hololampra Diels, Bot. Jahrb. Syst. 67 (1935) 201; Summerh., J. Arnold Arbor. 22 (1941) 93. — *Ficus melinocarpa* Blume var. *hololampra* (Diels) Corner, Gard. Bull. Singapore 17 (1960) 462.

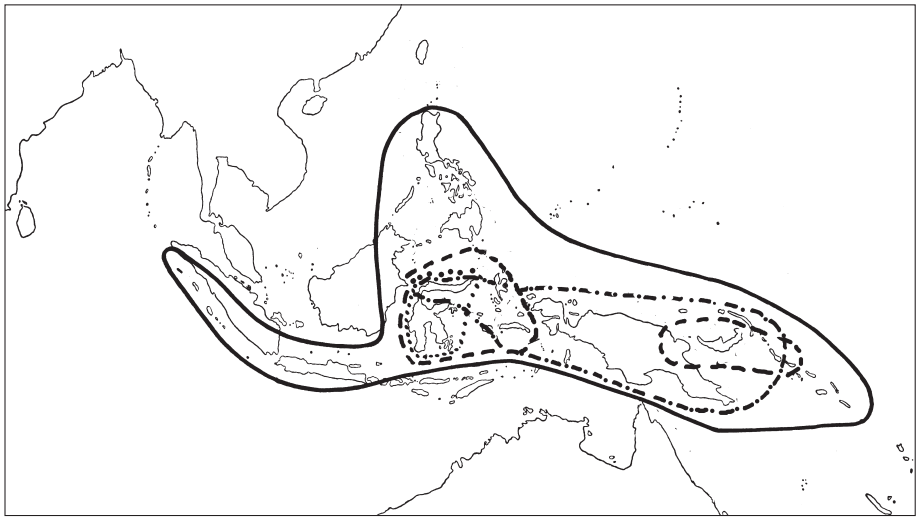
Ficus collinsii Elmer, Leafl. Philipp. Bot. 9 (1937) 3468; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 361.

Ficus irosinensis Elmer, Leafl. Philipp. Bot. 9 (1937) 3473; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 360.

Tree up to 35 m tall, with buttresses up to 2 m high or without, deciduous. *Branchlets* often drying blackish. *Leafy twigs* 1.5–4 mm thick, hispidulous to puberulous (to hirtellous) or to glabrous, scabrous to smooth; internodes usually hollow. *Leaves* disti-

chous; lamina elliptic to ovate to obovate to oblong, (3–)5–15(–26) by 2–7(–13) cm, ± asymmetric, chartaceous to subcoriaceous, apex shortly acuminate to rounded, base ± inequilateral and subcordate to cuneate, margin irregularly crenate-dent(icul)ate to entire; upper surface puberulous mainly on the main veins to hispidulous or (sub)glabrous, ± scabrous to smooth, sometimes ± bullate, lower surface densely to sparsely puberulous to subhispidulous (to hirtellous to subvelutinous) on the veins or to (sub)glabrous, smooth to scabridulous; cystoliths on both sides; tertiary veins slightly prominent and smaller ones often flat beneath; lateral veins (3–)5–8(–9) pairs, the basal pair up to 1/4–1/2 the length of the lamina, these branched and mostly also other lateral veins branched or furcate, tertiary venation (laxly) scalariform; the waxy glands in the axils of both basal lateral veins, often extended to or largely on the midrib; petiole 0.5–3(–4) cm long, slightly different to almost equal in length on the same twig, sparsely to densely puberulous (to hirtellous to subvelutinous) to hispidulous or to subglabrous, the epidermis persistent; stipules amplexicaul, 0.5–1(–1.2) cm long, (minutely) puberulous or only ciliolate, caducous. *Figs* axillary or just below the leaves, solitary or in pairs; peduncle 0.2–1(–1.5) cm long; peduncular bracts 3, often verticillate from the lower half up to the apex of the peduncle, 1–1.5 mm long; receptacle (sub)globose to ellipsoid, (0.6–)0.8–1.4 cm diam. when dry, 1.2–2 cm diam. when fresh, minutely hispidulous, scabridulous, without lateral bracts, yellow to orange or red to purple-black at maturity, apex convex, ostiole 1.5–3 mm diam.; internal hairs abundant. *Tepals* pinkish, glabrous or hairy at the apices. *Styles* glabrous. — **Map 6.**

Distribution — From Malesia to the Solomon Islands; in *Malesia*: Sumatra, Java, Borneo (northern and eastern), Philippines (Luzon, Leyte, Mindoro), Celebes (Minahassa), Moluccas (Mototai, Halmahera, Obi Islands, Sula Islands, Ceram, Ambon, Aru Islands), New Guinea (New Britain).



Map 6. Distribution of some species of subg. *Sycidium* sect. *Sycidium*: *F. melinocarpa* Blume (continuous line); *F. schumanniana* Warb. (broken line, eastern); *F. tenuicuspidata* Corner (dotted line); *F. tonsa* Miq. (broken line, western); *F. trachypison* K. Schum. (dot-dash line).

Habitat — Forest and secondary growth, at altitudes up to 800 m.

Notes — 1. This species shows affinities to *F. trachypison*. It is different in the fully amplexicaul stipules, the absence of additional waxy glands, the inconspicuous indumentum (in most collections), and the (almost) flat smaller veins on the lamina beneath. Some, apparently (sub)juvenile specimens are more conspicuously hairy. This applies in particular to two collections from New Guinea (Morobe Province) with dense (subvelutinous) indumentum on the venation of the lamina beneath and on the petioles; according to label data the foliage is hispid in the lower part of the tree and glabrous in the top.

2. This species resembles *F. stellaris*, in particular the montane subspecies, from which it differs by the fully amplexicaul stipules.

3. It also resembles the lowland species, *F. myiopotamica*, which is glabrous, except on the margin of the stipules and on the impressed base of the midrib above**.**

22. Ficus montana Burm.f.

Ficus montana Burm.f., Fl. Ind. (1768) 226; Blume, Bijdr. (1825) 471; Miq., London J. Bot. 7 (1848) 234; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 271, 291; Merr., Enum. Born. (1921) 225; Corner, Gard. Bull. Singapore 17 (1960) 453; 21 (1965) 64; Kochummen, Tree Fl. Malaya 3 (1978) 151; Tree Fl. Sabah & Sarawak 3 (2000) 290.

?*Ficus javanensis* Dum.Cours., Bot. Cult. 3 (1802) 680; Mabb., Taxon 53 (2004) 191.

Ficus purpurascens Blume, Bijdr. (1825) 471; Desf., Cat. Hort. Paris, ed. 3 (1829) 412; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 255; Miq., London J. Bot. 7 (1848) 427; Fl. Ind. Bat. 1, 2 (1859) 299; Choix Pl. Buitenzorg (1864) t. 10; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 271, 291; King, Sp. Ficus 2 (1888) 75, t. 93. — *Ficus montana* Burm.f. var. *purpurascens* (Blume) Corner, Gard. Bull. Singapore 17 (1960) 453.

Ficus quercifolia Lodd., Bot. Cab. (1830) t. 1540, non Blume 1825 nec Roxb. 1832.

Ficus quercifolia Roxb., Fl. Ind., ed. Carey 3 (1832) 534, non Blume 1825; Wight, Ic. 2 (1843) t. 646; Miq., London J. Bot. 7 (1848) 232; Fl. Ind. Bat. 1, 2 (1859) 297; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; King, Sp. Ficus 2 (1888) 77, t. 95; Fl. Brit. India 5 (1888) 519; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 185; Renner, Bot. Jahrb. Syst. 39 (1907) 395; Koord., Exk. Fl. Java 4 (1924) t. 764, 765; Ridl., Fl. Malay Penins. 3 (1924) 339; Ochse & Bakh., Veg. Dutch East Indies (1931) 503, 504; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1012; Backer & Bakh.f., Fl. Java 2 (1965) 27.

Ficus humilis Roxb., Fl. Ind., ed. Carey 3 (1832) 535; Wight, Ic. 2 (1843) t. 635; Miq., London J. Bot. 7 (1848) 229; Fl. Ind. Bat. 1, 2 (1859) 299; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 271. — *Ficus quercifolia* Roxb. var. *humilis* (Roxb.) King, Sp. Ficus 2 (1888) 77.

Ficus inconstans Miq., London J. Bot. 7 (1848) 232; Fl. Ind. Bat. 1, 2 (1859) 298. — *Ficus quercifolia* Roxb. var. *inconstans* (Miq.) Ridl., Fl. Malay Penins. 3 (1924) 339.

Ficus polycarpa Roxb. var. *latifolia* Miq., Pl. Jungh. (1851) 57.

Ficus sclerocoma Miq., Pl. Jungh. (1851) 58; Fl. Ind. Bat. 1, 2 (1859) 302; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; King, Sp. Ficus 2 (1888) 184.

Ficus biglandulosa Miq., Fl. Ind. Bat., Suppl. (1861) 426.

Ficus madurensis Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 222, 291; King, Sp. Ficus 2 (1888) 83, t. 104; Corner, Gard. Bull. Singapore 17 (1960) 453; 21 (1965) 64; Kochummen, Tree Fl. Malaya 3 (1978) 151.

Ficus quercifolia Roxb. var. *aspera* Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 188.

Ficus ampelas Burm.f. var. *bogoriensis* (Koord. & Valeton) Hochr. forma *microcarpa* Hochr., Candollea 2 (1925) 12, 328.

Ficus smaragdina S. Moore, J. Bot. 63, Suppl. (1925) 171.

Ficus madurensis Miq. var. *angustifolia* Corner, Gard. Bull. Singapore 17 (1960) 453.
Ficus copiosa auct. non Steud.: King, Sp. Ficus 2 (1888) 85, prosched. *Beccari, PS 772*; Ridl., Fl. Malay Penins. 3 (1924) 340.

Laxly-branched shrub up to 2 m tall, sometimes creeping, or treelet. *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 to linear-lanceolate), (3–)8–24(–32) by (0.5–)2–10(–18) cm, symmetric to slightly asymmetric, chartaceous (to subcoriaceous), apex acuminate to subacute, base cuneate to rounded to subcordate, margin (coarsely) crenate-dentate to subentire or on young plants often irregularly pinnately lobed; upper surface (sub)glabrous or punctate (by cystoliths), smooth or ± scabrous, lower surface sparsely whitish hispidulous to strigillose on the veins, scabridulous; cystoliths on both sides; lateral veins 6–9(–16) pairs, the basal pair up to (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 0.5–4 (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 or 3, c. 0.5 mm long; receptacle (sub)globose, 0.5–0.8 cm diam. when dry, sparsely minutely puberulous to glabrous, (usually) with few c. 0.5 mm long lateral bracts, orange to red at maturity, apex ± convex, ostiole c. 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. — **Map 5.**

Distribution — India (?), Lower Myanmar, Thailand; in *Malesia*: Malay Peninsula, Sumatra, Java, Borneo.

Habitat — Forest undergrowth in wet and/or rocky forest places or in rocky stream beds, also in secondary growth, at altitudes up to c. 1500 m.

Notes — 1. The leaves can be linear-lanceolate with up to c. 16 pairs of lateral veins, the basal pair up to 1/20 the length of the lamina, and the tertiary venation (sub)reticulate (e.g., *Chai S.36002* from Sarawak and *Murata et al. 174* from E Kalimantan). More pronouncedly deviating, largely due to the small (3–12 by 0.5–2 cm) lamina with an (sub)acute apex and short (0.5–1 cm long) petioles is *Reksodihardjo 133* from E Kalimantan (near Samarinda). Moreover, the styles are hairy in this collection and the endocarp bodies (fruits) less pronouncedly tuberculate. Some other collections from Borneo also have relatively short petioles, slightly variable in length on the same twig.

2. The diversity in Borneo is such that *F. subsidens* may prove to be part of the Bornean diversity.

3. The features of the fruits (in fact endocarp bodies) indicate that this species is related to *F. exasperata*, and through that species with the African and Madagascan species.

4. It is remarkable that this species, which according to label data is at least locally abundant, is so poorly represented in herbarium collections and from scattered localities.

23. Ficus myiopotamica C.C. Berg

Ficus myiopotamica C.C. Berg, Blumea 48 (2003) 580.

Tree up to 40 m tall, with buttresses. *Branchlets* drying blackish. *Leafy twigs* 2–4 mm thick, glabrous, (almost) smooth; internodes solid. *Leaves* distichous; lamina elliptic (to suborbicular), 7–17 by 4.5–10 cm, ± asymmetric, (sub)coriaceous, apex subacute, base ± inequilateral, rounded to subcordate, margin subentire, slightly revolute; upper surface sparsely and minutely puberulous at the base (or lower part) of the midrib, smooth, lower surface glabrous (almost); cystoliths on both sides; the base (or lower part) of the midrib impressed, lateral veins 6–12 pairs, the basal pair up to 1/4–1/3 the length of the lamina, these and mostly also other lateral veins branched or furcate, tertiary venation scalariform, slightly prominent but the smaller to almost flat beneath; waxy glands in the axils of both basal lateral veins; petiole 1.5–1.8 cm long, almost equal in length on the same twig, sparsely and minutely puberulous in and along the adaxial groove of the petiole, epidermis persistent; stipules semi-amplexicaul, 0.3–0.4 cm long, ciliolate, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.4–0.5 cm long; peduncular bracts 3, verticillate (subtending the receptacle or on the basal part of the receptacle), 0.5–1.5 mm long; receptacle (sub)globose, c. 1 cm diam. when dry, glabrous, punctate, smooth, without lateral bracts, yellow to orange at maturity, apex convex, ostiole 1–1.5 mm diam., surrounded by a low rim; internal hairs rather abundant. *Tepals* pale red, glabrous. *Styles* glabrous. *Fruits* tuberculate.

Distribution — New Guinea (eastern).

Habitat — Forest (on riverbanks), at low altitudes.

Notes — 1. The material here referred to this species, was included in *F. melinocarpa*, from which it differs in the semi-amplexicaul stipules and in being glabrous on nearly all parts, except for the margins of the stipules and in and along the adaxial groove of the petiole and the basal part of the midrib, which is clearly impressed.

2. This species shows affinities to *F. leptodictya*, also glabrous on the various parts, but with usually a cuneate to obtuse base of the lamina and the basal lateral veins usually running close to the margin and then unbranched.

24. Ficus odorata (Blanco) Merr.

Ficus odorata (Blanco) Merr., Publ. Gov. Lab. Philipp. 17 (1904) 15; 27 (1905) 79; Philipp. J. Sci., 1, Suppl. (1906) 44; Elmer, Leafl. Philipp. Bot. 1 (1906) 201, 258; 2 (1908) 546; Merr., Fl. Manila (1912) 174; Sp. Blancoan. (1918) 126; Enum. Philipp. Flow. Pl. 2 (1923) 59; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 278, 359; Corner, Gard. Bull. Singapore 21 (1965) 69. — *Ficus hispida* L.f. var. *odorata* Blanco, Fl. Filip. (1837) 683 pro var.; Fl. Filip., ed. 2 (1845) 476; Náves in Blanco, Fl. Filip., ed. 3 (1879) 89, f. 358.

Ficus arenata Elmer, Leafl. Philipp. Bot. 4 (1911) 1263; 7 (1914) 2405.

Shrub or tree up to 8 m tall. *Branchlets* drying brown. *Leafy twigs* 2–4 mm thick, whitish to yellowish hirtellous to puberulous to subhispidulous, smooth to scabridulous;

internodes solid. *Leaves* distichous; lamina oblong to elliptic to subovate, (5–)10–25 (–33) by 4–11(–15) cm, strongly asymmetric, subcoriaceous to chartaceous, apex acuminate, base strongly inequilateral, at the broad side cordate with the lobe often covering the petiole, at the narrow side cordate to cuneate, margin irregularly dent(icul)ate; upper surface hispidulous to strigillose, ± scabrous, lower surface whitish to yellowish puberulous to subhispidulous to strigillose on the veins, smooth to scabridulous; cystoliths on both sides; lateral veins (5–)6–8 pairs, the basal pair up to 1/3–1/2 the length of the lamina, (at least) at the broad side branched, often also some other lateral veins branched or furcate, tertiary venation (laxly) scalariform; waxy glands in the axils of both basal lateral veins, and at the broad side of the lamina also in the axil of the lateral vein below the main basal one, moreover, smaller ones in the axils of other lateral veins; petiole 0.5–1.5 cm long, slightly different to almost equal in length on the same twig, puberulous to hirtellous, the epidermis persistent; stipules semi-amplexicaul, 0.7–1 cm long, whitish (minutely) puberulous on the keel and ciliolate or subglabrous, caducous (or subpersistent). *Figs* axillary, mostly solitary, ramiflorous on short spurs, or cauliflorous, on clusters of up to 1 cm long leafless branches with short internodes; peduncle 0.2–1.3 cm long; peduncular bracts 3, scattered, 2 subopposite, or 3 verticillate, 1.5–3 mm long, appressed-puberulous outside; receptacle subglobose, 1–1.8 cm diam. when dry, densely whitish to yellowish puberulous to subvelutinous, smooth, without lateral bracts, yellow to red at maturity, apex convex, ostiole c. 4 mm diam., surrounded by a rosette of apical bracts; internal hairs abundant. *Tepals* red, glabrous. *Styles* glabrous.

Distribution — Philippines (Batan Islands, Luzon, Negros, Bohol, Leyte, Samar, Panay, Mindanao).

Habitat — Forest, often near streams, also in secondary growth and on rocks, at low altitudes.

Notes — 1. This species is very closely related to *F. elmeri*, under which the differences are discussed.

2. The leaves are said to be fragrant on drying.

25. Ficus opposita Miq.

Ficus opposita Miq., London J. Bot. 7 (1848) 426; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; Benth., Fl. Austral. 6 (1873) 175; F. Muell., Fragm. Phyt. Austral. 8 (1874) 246; F.M. Bailey, Queensl. Fl. 5 (1902) 1477; Compr. Cat. Qld. Pl. (1913) 487; Domin, Bibl. Bot. 89 (1921) 570; Corner, Gard. Bull. Singapore 21 (1965) 70; Backer & Bakh.f., Fl. Java 2 (1965) 29.

Ficus orbicularis A. Cunn. ex Miq., London J. Bot. 7 (1848) 426; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; Benth., Fl. Austral. 6 (1873) 175; F.M. Bailey, Queensl. Fl. 5 (1902) 1476; Compr. Cat. Qld. Pl. (1913) 487.

Ficus aculeata A. Cunn. ex Miq., London J. Bot. 7 (1848) 426.

?*Ficus beckleri* Miq., J. Bot. Néerl. 1 (1861) 241; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; Benth., Fl. Austral. 6 (1873) 175.

Ficus fitzalani Miq., J. Bot. Néerl. 1 (1861) 242; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; Benth., Fl. Austral. 6 (1873) 163.

Ficus micracantha Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 221, 291. — *Ficus aculeata* A. Cunn. ex Miq. var. *micracantha* (Miq.) Benth., Fl. Austral. 6 (1873) 175; F.M. Bailey, Queensl. Fl. 5 (1902) 1476; Compr. Cat. Qld. Pl. (1913) 487; Specht, Rec. Am. Austral. Exp. Arnhem Land 3 (1958) 216. — *Ficus opposita* Miq. var. *micracantha* (A. Cunn. ex Miq.) Corner, Gard. Bull. Singapore 17 (1960) 471.

Ficus conjugata Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 222, 291; King, Sp. Ficus 2 (1888) 79, t. 98; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 192; Koord., Atlas Baumart. Java 4 (1918) t. 759 F–I.
Ficus radula Banks ex Hiern, J. Bot. 39 (1901) 4, non Willd. 1806.
Ficus xerophila Domin, Bibl. Bot. 89 (1921) 568.
Ficus yarrabensis Domin, Bibl. Bot. 89 (1921) 569, f. 120.
Ficus androbrota Summerh., J. Arnold Arbor. 10 (1929) 143; 22 (1941) 90; Diels, Bot. Jahrb. Syst. 67 (1935) 194. — *Ficus cumingii* Miq. var. *androbrota* (Summerh.) Corner, Gard. Bull. Singapore 17 (1960) 458.
Ficus dichroa Summerh., J. Arnold Arbor. 10 (1929) 147; 22 (1941) 88; Diels, Bot. Jahrb. Syst. 67 (1935) 193.
Ficus apolepomena Summerh., J. Arnold Arbor. 10 (1929) 151; Diels, Bot. Jahrb. Syst. 67 (1935) 200.
Ficus branderhorstii Diels, Bot. Jahrb. Syst. 67 (1935) 201; Summerh., J. Arnold Arbor. 22 (1941) 92.

Shrub or tree up to 15 m tall. *Branchlets* often drying red-brown. *Leafy twigs* 1.5–4 mm thick, whitish puberulous to hispidulous or (sub)tomentose, smooth to scabridulous; internodes hollow or solid. *Leaves* (sub)opposite or alternate (sub)distichous or in laxly spirals (or subverticillate); lamina oblong to elliptic to subovate or to subobovate (or to lanceolate), 4–16 by 1.5–8 cm, (almost) symmetric, subcoriaceous to chartaceous, apex acuminate (mostly with a relatively short and blunt acumen, sometimes with a relatively long and acute acumen) to rounded (to emarginate), base (almost) equilateral, cuneate to rounded to subcordate, margin entire to ± irregularly crenate-denticulate, often ± revolute; upper surface (minutely) hispidulous, scabrous, lower surface minutely whitish hispidulous or (sub)tomentose on the veins, scabrous or smooth; cystoliths on both sides; lateral veins (4–)6–9 pairs, the basal pair up to 1/6–1/3 the length of the lamina, mostly running close to the margin of the lamina and then unbranched, often other lateral veins, in particular in the upper part of the lamina, furcate, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins or extended to or on the midrib and then often fused; petiole 0.8–2(–4) cm long, slightly different to almost equal in length on the same twig, whitish hispidulous or (sub)tomentose, the epidermis persistent; stipules semi-amplexicaul, chartaceous, 0.3–0.5(–0.8) cm long, sparsely puberulous, caducous. *Figs* axillary and also just below the leaves, in pairs or solitary; peduncle 0.2–1 cm long; peduncular bracts 3, scattered (up to the base of the receptacle) or verticillate, 0.5–1 mm long; receptacle (sub)globose, 0.8–1.2 cm diam. when dry, 1.5–2 cm diam. when fresh, minutely hispidulous, scabrous, mostly without lateral bracts, purple-black at maturity, apex convex, ostiole 1.5–2 mm diam.; internal hairs abundant, brownish. *Tepals* whitish, glabrous, or hairy at the apices. *Styles* glabrous. — **Map 3.**

Distribution — From Malesia to northern Australia; in *Malesia*: Java (Pulau Sangiang, an islet in the Sunda Strait) and New Guinea.

Habitat — Monsoon forest or scrub, margins of gallery forest and mangrove, savannah woodland, and along the sea coast, also in secondary growth, at low altitudes or at altitudes between c. 1500 and 2500 m.

Uses — The leaves are eaten as vegetable.

Notes — 1. The species is very variable, as with regard to the dimensions of the lamina, the length of the petiole, the number of lateral veins, the indumentum, and the frequency of (sub)opposite leaves. The majority of the collections from New Guinea, including those referred to *F. cumingii* var. *androbrota* by Corner (1960), are rather

sparsely hispidulous. However, in a few collections (including the type of *F. branderhorstii*), the indumentum of the leafy twig, the petiole and the lamina beneath are densely (sub)tomentose; the lamina is, therefore, smooth, in contrast to most other New Guinean collections. The few collections from Java match the soft-hairy form.

2. In Papua New Guinea, the species is represented by a montane form (at altitudes between c. 1500 and 2500 m). It is morphologically distinct in the relatively long acute acumen of the lamina (although this may vary to a short and blunt acumen or to a rounded apex in the same collection). The apices of the growth units of the branches tend to bear a whorl of three leaves.

3. This species is related to *F. cumingii*, the differences being discussed under the latter. Both species show affinities to *F. wassa*. *Ficus opposita* can be distinguished from the partly sympatric *F. wassa* by the short and on the same leafy twig about equally long petioles with persistent epidermis, the waxy glands often largely on the petiole (separate or fused), and the shorter less stiff stipules.

26. Ficus phaeosyce Lauterb. & K. Schum.

Ficus phaeosyce Lauterb. & K. Schum., Fl. Schutzgeb. Südsee (1901) 276; Diels, Bot. Jahrb. Syst. 67 (1935) 200; Summerh., J. Arnold Arbor. 22 (1941) 92; Corner, Gard. Bull. Singapore 21 (1965) 64.

Much branched shrub (sometimes creeping) or tree up to 8 m tall. *Leafy twigs* 1.5–4 mm thick, densely dark brown to purplish hirtellous to subhirsute or strig(ill)ose, the stiff coloured hairs often intermixed with much shorter white hairs, conspicuous lenticels just below the (scars of the) stipules; internodes solid. *Leaves* spirally arranged; lamina oblong to subobovate (to elliptic or to lanceolate), (1–)3–18 by (0.5–)1.5–6 cm, symmetric to slightly asymmetric, chartaceous, apex acuminate, base rounded to subcordate (or to cuneate), margin ± coarsely dentate to lobate, or partly denticulate; upper surface brown to whitish strigillose, ± scabrous, lower surface dark brown to purplish hirtellous to subhirsute or strig(ill)ose to puberulous on the veins, the stiff coloured hairs often intermixed with much shorter white hairs, ± scabrous; cystoliths only beneath or also sparsely above; lateral veins (3–)6–10 pairs, the basal pair up to 1/8–1/6 the length of the lamina, unbranched, tertiary venation scalariform (to subreticulate); waxy glands absent; petiole (0.2–)0.5–1.5(–3.5) cm long, distinctly different to almost equal in length on the same twig, brown hirtellous to strigillose, the stiff coloured hairs often intermixed with much shorter white hairs, the epidermis flaking off; stipules semi-amplexicaul, 0.2–0.8 cm long, brown strigillose, subpersistent or caducous. *Figs* axillary, in pairs or solitary, ramiflorous on spurs on the lesser branches, or cauliflorous, on up to 3.5 cm long branched leafless branchlets with short internodes, sessile or with a peduncle up to 0.2 cm long; peduncular (or basal) bracts 2 or 3, 0.5–1.5 mm long; receptacle (sub)globose, 0.4–0.7 cm diam. when dry, dark brown to purplish setulose (the hairs patent to appressed), with few up to 1.5 mm long lateral bracts, red at maturity, apex ± convex, ostiole c. 1 mm diam., surrounded by a rosette of up to 1 mm long (oblong and rather thin) apical bracts, pointing upwards; internal hairs abundant, white or brown. *Tepals* reddish, glabrous. *Styles* glabrous.

Distribution — New Guinea (eastern).

Habitat — Forest and secondary growth, at altitudes up to c. 1300 m.

27. **Ficus porphyrochaete** Corner

Ficus porphyrochaete Corner, Gard. Bull. Singapore 17 (1960) 451; 21 (1965) 63; Philos. Trans., Ser. B, 253 (1967) 91, t. 23.

Tree up to 12 m tall. *Leafy twigs* 5–7 mm thick, dark brown hirsute to hirtellous, with rather conspicuous lenticels just below the (scars of the) stipules, scars of leaves prominent; internodes solid. *Leaves* spirally arranged; lamina oblong to elliptic (to subrhombic), 10–40 by 6–20 cm, (almost) symmetric, chartaceous, apex acuminate, base

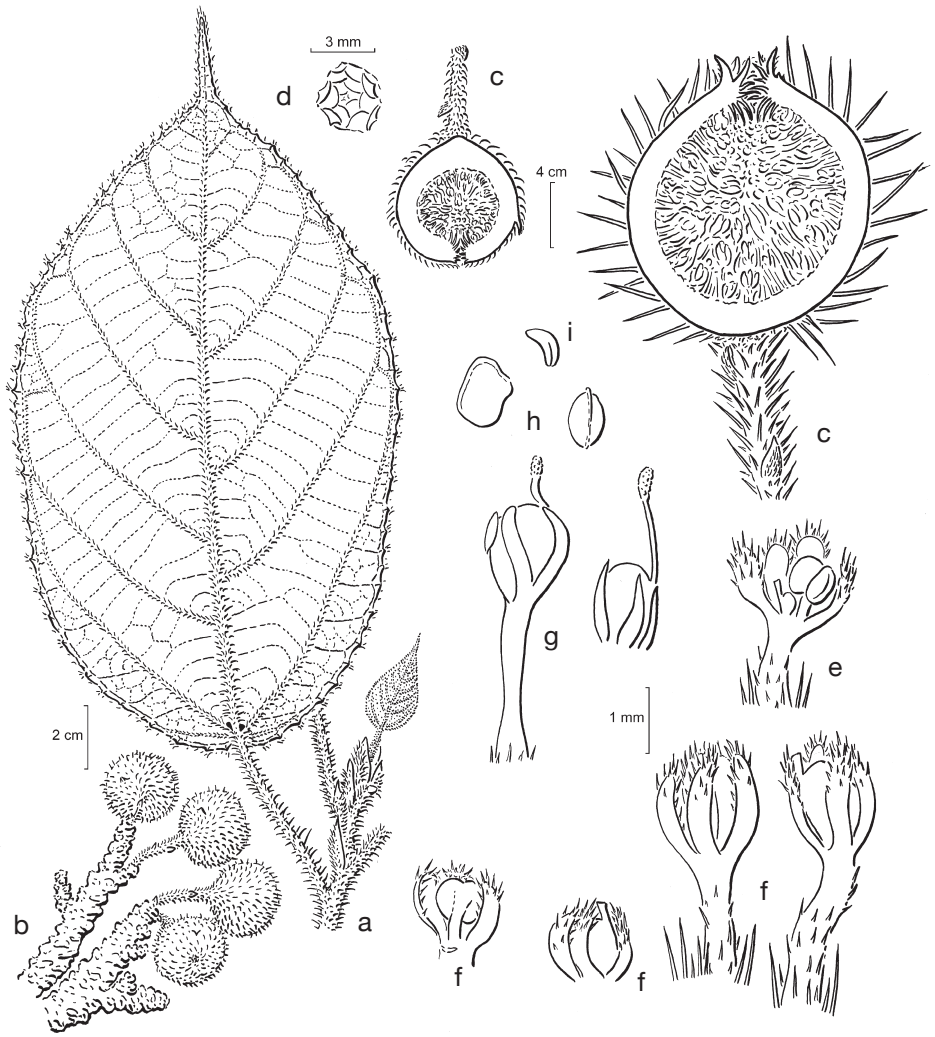


Fig. 45. *Ficus porphyrochaete* Corner. a. Leaf twig; b. fig-bearing branchlets; c. figs; d. ostiole; e. staminate flower; f. short-styled flowers; g. long-styled flowers; h. fruits; i. embryo (a, b: *RSS 2378*; c–f: *Brass 24162*; g–i: *Carr 16381*). From Philos. Trans., Ser. B, 253 (1967) 91.

(sub)cordate (to rounded), margin denticulate (towards the apex); upper surface white to brown strigillose, ± scabrous to almost smooth, lower surface (dark) brown hirtellous to subhirsute to strig(ill)ose, the hairs ± appressed or patent and mainly pointing sidewards on the main veins, puberulous or hispidulous on the smaller veins, on the main veins the stiff brown hairs sometimes intermixed with minute patent white ones, ± scabrous or smooth; cystoliths on both sides (or only beneath); lateral veins 6–9 pairs, the (main) basal pair up to 1/4–1/3 the length of the lamina, these and other lower lateral veins mostly branched or furcate, tertiary venation scalariform; waxy glands largely on the midrib, below the axils of the (main) basal lateral veins, mostly also below the axils of other lateral veins; petiole 2–13 cm long, usually varying considerably on the same twig, (dark) brown strigillose to subhirsute, the epidermis persistent or ± flaking off; stipules semi-amplexicaul, 1.5–3.5 cm long, densely white appressed-puberulous to brown strigillose towards and on the midrib, (sub)persistent. *Figs* axillary, in pairs or solitary, or cauliflorous, on large clusters of up to 12 cm long branched leafless branchlets with short internodes; peduncle 0.3–1.5(–2) cm long; peduncular bracts, mostly 2 or 3, scattered, 1–3 mm long; receptacle subglobose, 0.7–1.5 cm diam. when dry, 1.5–2 cm diam. when fresh, brown strigillose to setose, the rigid and irritant hairs with a swollen base, with few up to 2 mm long lateral bracts, red to brown at maturity, apex ± convex, ostiole c. 3 mm diam., surrounded by up to 3 mm long apical bracts pointing upwards; internal hairs abundant to sparse or absent. *Tepals* dark red, glabrous. *Styles* glabrous. — **Fig. 391–p, 45.**

Distribution — New Guinea (eastern).

Habitat — Forest and secondary growth, at altitudes up to c. 1500 m.

Note — The material from the Solomon Islands (at L) inserted by Corner in this species does not satisfactorily match the material from New Guinea, as being distinct in the more slender leafy twigs (3–5 mm thick), and the up to 1 cm long and caducous stipules. It has been transferred to *F. gul* (var. *solomonensis*), which makes the description (Corner, Philos. Trans., Ser. B, 253 (1967) 90), as with regard to the presence of hairs on the flowers, more uniform for *F. porphyrochaete*.

28. **Ficus primaria** Corner

Ficus primaria Corner, Gard. Bull. Singapore 17 (1960) 457; 21 (1965) 66.

Tree up to 30 m tall, with up to 1.5 m high buttresses. *Leafy twigs* 5–7 mm thick, whitish puberulous to hirtellous, smooth; scars of leaves prominent; internodes solid. *Leaves* spirally arranged to subopposite; lamina (sub)obovate to oblong or elliptic (to subpandurate), (8–)15–35 by (4.5–)7–20, (almost) symmetric, chartaceous, apex acuminate (to acute), base cordate (with a narrow sinus) to subcordate (to rounded), margin denticulate; upper surface hispid to puberulous, ± scabrous to almost smooth, lower surface white hispidulous to puberulous, scabrous or smooth; cystoliths only beneath; lateral veins 6–11 pairs, the basal pairs up to 1/5–1/4 the length of the lamina, branched, the lower lateral veins mostly branched or furcate, tertiary venation scalariform, the reticulum prominent; waxy glands largely on the midrib below the axils of the (main) basal lateral veins, mostly also below the axils of other lateral veins;

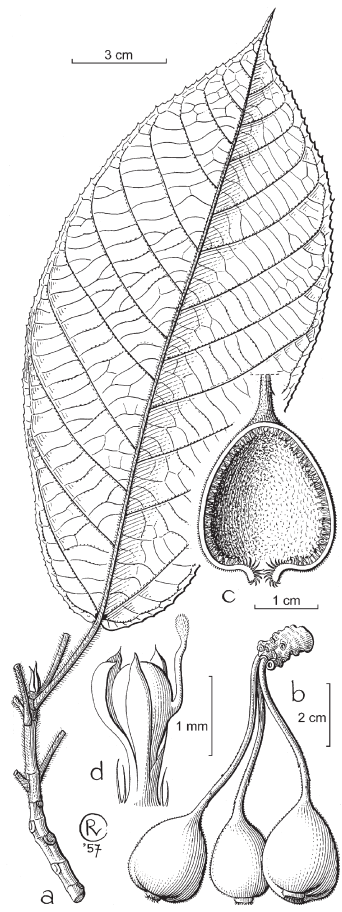


Fig. 46. *Ficus primaria* Corner. a. Leafy twig; b. fig-bearing branchlet; c. fig; d. long-styled flower (all: *Hoogland 4958*).

petiole 1.5–13 cm long, distinctly different in length on the same twig, whitish puberulous to subhirsute or hispidulous to subhispid, the hairs distinctly different in length, the epidermis persistent; stipules semi-amplexicaul, 0.6–1.3 cm long, sparsely appressed-puberulous to glabrous (only punctate), caducous, but (sub)persistent in tufts at the apices of the leafy twigs. *Figs* cauliflorous, clustered on up to 7 cm long branched leafless branchlets with short internodes on the main branches, down to the base of the trunk, ± pendulous; peduncle 2.5–7.5 cm long; peduncular bracts, mostly 2 or 3, scattered, 0.5–1 mm long; receptacle pyriform to obovoid, 3–3.5 by 2–2.5 cm when dry, 3.5–5 cm diam. when fresh, densely hispidulous to puberulous, scabrous to smooth, without lateral bracts, colour at maturity unknown, apex ± convex to flat, ostiole c. 3 mm diam., surrounded by 1–2 mm long bracts, pointing upwards and surrounded by a rim, forming a crateriform entrance to the ostiole; internal hairs abundant to sparse. *Tepals* reddish, those of the pistillate flowers subfiliform, glabrous. *Styles* glabrous. — **Fig. 46; Map 5.**

Distribution — New Guinea (Western: near Manokwari; eastern: Madang Province, Morobe Province, Western Highlands Province, New Britain).

Habitat — Forest, at altitudes up to 500 m.

29. Ficus pseudowassa Corner

Ficus pseudowassa Corner, Philos. Trans., Ser. B, 253 (1967) 103, t. 31, 32.

Tree up to 15 m tall. *Branchlets* often drying red-brown. *Leafy twigs* 1.5–2.5 mm thick, minutely whitish hispidulous to glabrous, scabridulous to smooth; internodes solid or hollow. *Leaves* distichous; lamina oblong to elliptic to subovate or to subobovate, 10–22 by 3–11 cm, mostly asymmetric, sometimes almost symmetric, chartaceous, apex acuminate (to subacute), base ± inequilateral (to equilateral), rounded to truncate to subcordate or to cuneate, margin irregularly crenate-denticulate to subentire; upper surface glabrous, scabridulous to smooth, lower surface minutely whitish hispidulous on the main veins to (sub)glabrous, smooth to scabridulous; cystoliths on both sides; lateral veins 4–8 pairs, the basal pair up to 1/3–1/2 the length of the lamina,

usually branched, at least at the broad side of the lamina, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins, often partly on the midrib or occasionally fused in the middle of the midrib, small and/or faint glands in the axils of other alteral veins; petiole (0.7–)1–1.5(–2) cm long, slightly different to almost equal in length on the same twig, sparsely whitish minutely puberulous to glabrous, the epidermis persistent; stipules semi-amplexicaul, 0.4–0.7 cm long, sparsely minutely appressed-puberulous, caducous. *Figs* axillary or just below the leaves, solitary or in pairs, or ramiflorous to cauliflorous, on initially solitary, but by branching clusters of up to 1 cm long leafless branches with short internodes; peduncle 0.5–1.8 cm long; peduncular bracts 2 or 3, scattered, 2 (sub)opposite, or 3 verticillate, c. 0.5 mm long; receptacle (sub)globose, 0.7–1.3 cm diam. when dry, 1.5–2 cm diam. when fresh, glabrous, smooth, without lateral bracts, red or pinkish-yellow at maturity, apex convex to ± umbonate, ostiole 1–2 mm diam.; internal hairs abundant. *Tepals* reddish or whitish, glabrous or hairy. *Styles* glabrous or hairy. *Fruits* ± tuberculate.

Distribution — New Guinea (eastern: Morobe Province, East Sepik Province, New Britain); common in the Solomon Islands.

Habitat — Forest, at altitudes up to c. 1300 m.

Notes — 1. This species shows affinities to *F. leptodictya*, *F. stellaris*, and *F. schumanniana*. It differs from *F. leptodictya* in the branched basal lateral veins at the broad side of the lamina and the presence of (faint) additional waxy glandular spots in the axils of other lateral veins than the basal ones. Such glandular spots are neither found in *F. stellaris*, in which the figs are axillary or occur just below the leaves, whereas commonly far below the leaves on short-shoots in *F. pseudowassa*. In the lowland form of *F. stellaris*, the fig receptacles are distinctly smaller and the peduncles distinctly shorter than in *F. pseudowassa*.

2. The glandular spots are occasionally fused in the middle of the base of the midrib, as normally in *F. schumanniana*, in which the basal lateral veins are unbranched or faintly branched, unlike *F. pseudowassa*.

30. Ficus quercetorum Corner

Ficus quercetorum Corner, Gard. Bull. Singapore 18 (1961) 89; 21 (1965) 68.
Ficus tonsa Miq. var. *aspera* Corner, Gard. Bull. Singapore 17 (1960) 463; 21 (1965) 68.

Tree up to 7(–15) m tall. *Branchlets* often drying red-brown. *Leafy twigs* 1.5–3 mm thick, densely brown to whitish hirtellous to subvelutinous or puberulous to subhispid, smooth or scabridulous; internodes solid. *Leaves* distichous; lamina elliptic to oblong to ovate to subovate (to lanceolate), (2–)4–15(–30) by (1.5–)2.5–7(–9) cm, ± asymmetric, subcoriaceous, apex acuminate to subacute, base inequilateral, cordate to rounded at one side, cuneate to rounded at the other side, margin irregularly crenate-denticulate to subentire, ± revolute; upper surface hispidulous, puberulous on the midrib, scabrous, often ± bullate, lower surface densely whitish hirtellous to subtomentose on the veins, smooth to scabridulous (to scabrous); cystoliths on both sides; tertiary and smaller veins prominent beneath; lateral veins (3–)5–9 pairs, the basal pair up to 1/4–1/3(–1/2) the length of the lamina, if not running close to the margin, then faintly branched,

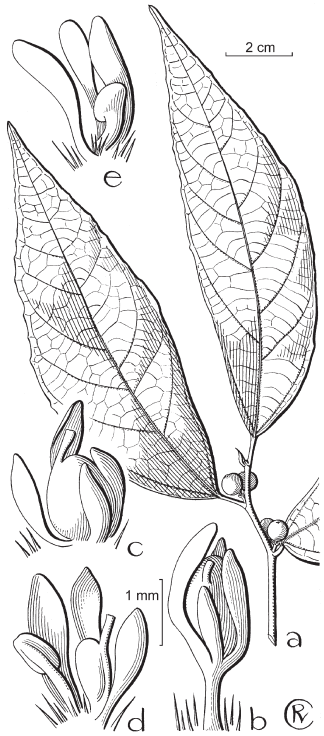


Fig. 47. *Ficus quercetorum* Corner. a. Leafy twig with figs; b, c. short-styled flowers; d, e. staminate flowers (all: *NGF 4863*).

tertiary venation scalariform; waxy glands in the axils of both basal lateral veins; petiole 0.3–1 cm long, slightly different to almost equal in length on the same twig, densely whitish hirtellous to subtomentose, the epidermis persistent; stipules semi-amplexicaul, 0.3–0.8 cm long, (appressed-) puberulous, caducous. *Figs* axillary or just below the leaves, solitary or paired; peduncle 0.1–0.5 cm long; peduncular bracts (2 or) 3, scattered or 2 (sub)opposite or 3 verticillate (if subtending the receptacle, then often constituting a cupula-like structure up to the middle of the receptacle), 0.5–1 mm long; receptacle (sub)globose, 0.8–1.3 cm diam. when dry, hispidulous to subtomentose, scabrous or smooth, without lateral bracts (only displaced peduncular ones), yellow to orange at maturity, apex convex, ostiole 2–3 mm diam.; internal hairs abundant. *Tepals* red, glabrous. *Styles* glabrous. — **Fig. 47.**

Distribution — New Guinea (eastern, incl. New Britain).

Habitat — Montane forest and secondary growth, at altitudes between 1500 and 2500 m, in New Britain at c. 1050 m.

Note — This species is very closely related to *F. trachypison* and might prove to be only distinct on the subspecific level. The main differentiation in morphological characters appear to be the consistent absence of waxy glands in the axils of lateral veins others the basal ones and the absence of ramiflory. The two taxa can mostly be distinguished by the difference in indumentum, causing a smooth lower surface of the lamina in *F. quercetorum* and a ± scabrous one in *F. trachypison*. Moreover, the lamina dries greenish above in *F. quercetorum*, but brown in *F. trachypison*. The two taxa are ecologically distinct, as *F. trachypison* is essentially a lowland species, whereas *F. quercetorum* is found at high altitudes.

31. Ficus riedelii Teijsm. ex Miq.

Ficus riedelii Teijsm. ex Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 223, 292; King, Sp. Ficus 2 (1888) 94, t. 120; Koord., Minah. (1898) 606; Corner, Gard. Bull. Singapore 21 (1965) 67.
Ficus riedelii Teijsm. ex Miq. var. *minor* Corner, Gard. Bull. Singapore 17 (1960) 459.

Shrub or tree up to 10 m tall. *Branchlets* often drying red-brown. *Leafy twigs* 2–3.5 mm thick, brown hirtellous to subhirsute or to puberulous or to hispidulous, the long hairs intermixed with much shorter hairs, smooth to scabrous; internodes hollow or

solid. *Leaves* distichous or in lax spirals; lamina oblong to subobovate or to lanceolate, (3–)5–20(–30) by 2–7(–11) cm, ± asymmetric, chartaceous, apex acuminate (to rounded), base ± inequilateral, cuneate to rounded (to subcordate), margin irregularly crenate-dent(icul)ate to subentire (when juvenile lobate in the lower part), ± revolute; upper surface hispidulous to subhirtellous in the midrib, scabrous, lower surface brown hirtellous to puberulous to hispidulous on the veins, smooth or scabrous; cystoliths on both sides; tertiary and smaller veins prominent beneath; lateral veins (3–)5–6(–7, when juvenile –10) pairs, the basal pair up to 1/3–1/2 the length of the lamina, at the broad side branched, at both sides, or, if running close to the margin, then hardly or not, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins; petiole 0.4–1(–1.5) cm long, slightly different to almost equal in length on the same twig, brown hirtellous to puberulous to hispidulous, the epidermis persistent; stipules semi-amplexicaul to lateral, 0.3–1(–1.2) cm long, puberulous, caducous. *Figs* axillary, (large ones mostly) solitary or (small ones mostly) in pairs, subsessile or with a peduncle up to 0.4 cm long; peduncular bracts 1 or 2, mostly scattered (or subtending subsessile figs), 0.5–1 mm long; receptacle subglobose, 0.4–1.3 cm diam. when dry, densely hirtellous to subsetulose (with ± irritant hairs) or hispidulous, scabridulous or scabrous, with several subsubulate up to 5 mm long (or without) lateral bracts, colour at maturity unknown, apex convex, ostiole c. 2 mm diam., surrounded by a rosette of apical bracts, pointing upwards and up to 4 mm long; internal hairs few or absent. *Tepals* whitish to pinkish to whitish, minutely hairy at the apeces (or glabrous). *Styles* glabrous or sparsely hairy. — **Map 3.**

Distribution — Celebes (northern to south-eastern: incl. Buton Island, Kabaena Island, Muna Island, Wangiwangi Island).

Habitat — Forest, at altitudes up to c. 1000 m, rarely up to 2000 m.

Notes — 1. Two forms can be distinguished:

a. with the lamina relatively large, mostly 10–20 cm long, with relatively long indumentum on the lower surface and relatively large fig receptacles (0.8–1.3 cm diam. when dry), often distinctly pedunculate.
b. with the lamina relatively small, mostly 5–10 cm long, with short and rigid indumentum on most parts, and small fig receptacles (0.4–0.6 cm diam.), mostly subsessile.

Intermediates occur. The small-leaved form is the most common one in the south-eastern part of Celebes (on the islands). This form was described as var. *minor* (Corner 1960).

2. The leaves are mostly distichous or almost so, but tend to an arrangement in lax spirals. This feature as well as the colour of the indumentum, the conspicuous lateral veins and the rosettes of apical bracts around the ostiole, the conspicuous lateral bracts, and the presence of irritating hairs, link this species to the *F. conocephalifolia*-group.

3. *Ficus riedelii* shows in its leaf characters, such as the prominent venation beneath and dense indumentum, similarities to a small group of probably not closely related species comprising *F. macrorrhyncha*, *F. quercetorum*, and *F. trachypison*.

4. The presence of the species in the Moluccas (cf. Corner 1965) could not be confirmed during the present study.

32. **Ficus sandanakana** C.C. Berg

Ficus sandanakana C.C. Berg, Blumea 48 (2003) 583.

Shrub up to 1.5 m tall or treelet. *Leafy twigs* (1.5–)3–6 mm thick, brownish hispidulous; internodes hollow. *Leaves* spirally arranged; lamina oblong to lanceolate to linear-lanceolate, 6–29 by 1.5–12 cm, (almost) symmetric, chartaceous, apex acuminate, base rounded to obtuse, margin denticulate; upper surface brownish hispidulous, mainly on the veins, scabrous, lower surface brownish hispidulous, scabrous; cystoliths on both sides, sparse; lateral veins 6–9(–16) pairs, the basal pair up to 1/10–1/4 the length of the lamina, often branched in broad laminas, 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 1–9 cm long, slightly different to almost equal in length on the same twig, sparsely brownish hispidulous, the epidermis persistent; stipules semi-amplexicaul, 0.7–1 cm long, brownish strigillose, caducous. *Figs* in the leaf axils, paired or solitary, subsessile or sessile; peduncular bracts 1–3, 2–3 mm long; receptacle (sub)globose, 0.8–1.2 cm diam. when dry, sparsely hispidulous, scabridulous, without lateral bracts, orange at maturity, apex ± convex to umbonate, ostiole 1–1.5 mm diam., surrounded by c. 5 brown hairy apical bracts; internal hairs abundant, white, up to 1.5 mm long. *Tepals* whitish, conspicuously hairy, the hairs up to 1.5 mm long. *Styles* glabrous. *Fruits* (endocarp bodies) 1–1.5 mm long, subtetrahedral, tuberculate, weakly keeled.

Distribution — Borneo (northern: Sandakan District).

Habitat — Secondary growth, at low altitudes.

Note — This species is closely related to *F. montana* (which also occurs in N Borneo). It differs from the widespread *F. montana* in the thicker leafy twigs, the brownish indumentum on the various plant parts, the more finely and regularly dentate margin of the lamina, the (sub)sessile figs with relatively large peduncular (or basal) bracts (2–3 mm long), and in particular the conspicuously hairy inner surface of the fig receptacle and the hairy tepals.

33. **Ficus schumanniana** Warb.

Ficus schumanniana Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 243; Diels, Bot. Jahrb. Syst. 67 (1935) 197; Corner, Gard. Bull. Singapore 21 (1965) 70.

Tree up to 12 m tall or shrub. *Branchlets* often drying red brown. *Leafy twigs* 1.5–2.5 mm thick, sparsely to densely whitish to brownish puberulous to hispidulous, scabridulous to smooth; internodes hollow or solid. *Leaves* distichous; lamina oblong to subovate or to lanceolate, 5–15 by 2–6 cm, ± asymmetric to almost symmetric, chartaceous, apex acuminate to subcaudate, base ± inequilateral, cuneate to rounded, margin irregularly crenate-denticulate to subentire, often slightly revolute; upper surface sparsely puberulous to subhispidulous, mainly on the midrib to (sub)glabrous, ± scabrous, lower surface sparsely to densely puberulous to subhispidulous on the main veins, scabrous; cystoliths on both sides; lateral veins (4–)6–9 pairs, the basal pair running ± close to the margin, up to 1/4–1/3 the length of the lamina, unbranched or

branched, the other lateral veins usually unbranched, tertiary venation scalariform, the intercostals close together; waxy gland on the base of the midrib; petiole 0.7–1.4 cm long, slightly different to almost equal in length on the same twig, densely to sparsely whitish puberulous to hispidulous, the epidermis persistent; stipules semi-amplexicaul, 0.4–0.7 cm long, sparsely minutely puberulous to hispidulous, caducous. *Figs* axillary, solitary; peduncle 0.3–0.5 cm long; peduncular bracts 3, verticillate often subtending the receptacle, c. 1 mm long; receptacle (sub)globose, 0.5–0.8 cm diam. when dry, sparsely minutely hispidulous, ± scabrous, sometimes with few c. 0.5 mm long lateral bracts, orange to red at maturity, apex convex to slightly umbonate, ostiole 1–2 mm diam., surrounded by a low rim; internal hairs abundant. *Tepals* whitish, glabrous. *Styles* glabrous. — **Map 6.**

Distribution — Malesia to the Solomon Islands (Bougainville, Northern Shortland Island, Kolombangara Island); in *Malesia*: New Guinea (eastern, incl. New Britain).

Habitat — Forest and secondary growth, at low altitudes.

Note — The fused waxy glands at the base of the midrib beneath is a character that distinguishes this species from *F. leptodictya* and *F. pseudowassa*. Moreover, the tertiary venation is very regular with the intercostals close together and the apex of the lamina is subcaudate and gradually narrowed.

34. Ficus sciaphila Corner

Ficus sciaphila Corner, Philos. Trans., Ser. B, 259 (1970) 379, t. 21.

Tree up to 8 m tall. *Leafy twigs* 4–8 mm thick, glabrous, smooth, with some small lenticels just below the (scars of the) stipules; internodes hollow. *Leaves* spirally arranged to (sub)opposite; lamina obovate to oblanceolate, often subpandurate, (20–)25–50 by (8–)12–22 cm, symmetric or slightly asymmetric, subcoriaceous, apex acuminate, base cordate, margin (sub)entire; upper surface glabrous, smooth, lower surface very sparsely hispidulous on the main veins, scabridulous; cystoliths on both sides; lateral veins (8–)10–12 pairs, the basal pair up to 1/8–1/4 the length of the lamina, branched, tertiary venation (laxly) scalariform; waxy glands in the axils of both basal lateral veins and also smaller ones in the axils of other lateral veins; petiole 1.5–8 cm long, varying distinctly in length on the same twig, (2–)3–5 mm thick, glabrous, the epidermis flaking off; stipules semi-amplexicaul to lateral, 1.5–3(–3.5) cm long, stiff and often subsubulate, striate, glabrous or appressed-puberulous, subpersistent to caducous, on twig apices often tufts of (sub)persistent stipules. *Figs* cauliflorous, on clusters of up to 2 cm long leafless branches with short internodes; peduncle 2–3(–5) cm long; peduncular bracts 2 or 3, 0.5–1 mm long; receptacle (sub)globose to ellipsoid, 1.3–2 cm diam. when dry, glabrous, often conspicuously lenticellate, (usually) with few 0.5–1 mm long lateral bracts, colour at maturity unknown, apex ± convex, ostiole c. 2.5 mm diam., surrounded by a low rim; internal hairs minute and sparse or absent. *Tepals* whitish to pinkish, (sparsely) hairy at the apices or glabrous. *Styles* glabrous. — **Fig. 48.**

Distribution — New Guinea (New Britain and New Ireland).

Habitat — Forest along rivers (among limestone boulders), at low altitudes.

Note — This species is closely related to *F. copiosa* from which its differs in the larger lamina with more numerous lateral veins (10–12 pairs) and thick petioles of which the epidermis is flaking off over the whole length. It clearly differs from the New Guinean representatives of *F. copiosa* in the much longer stipules.

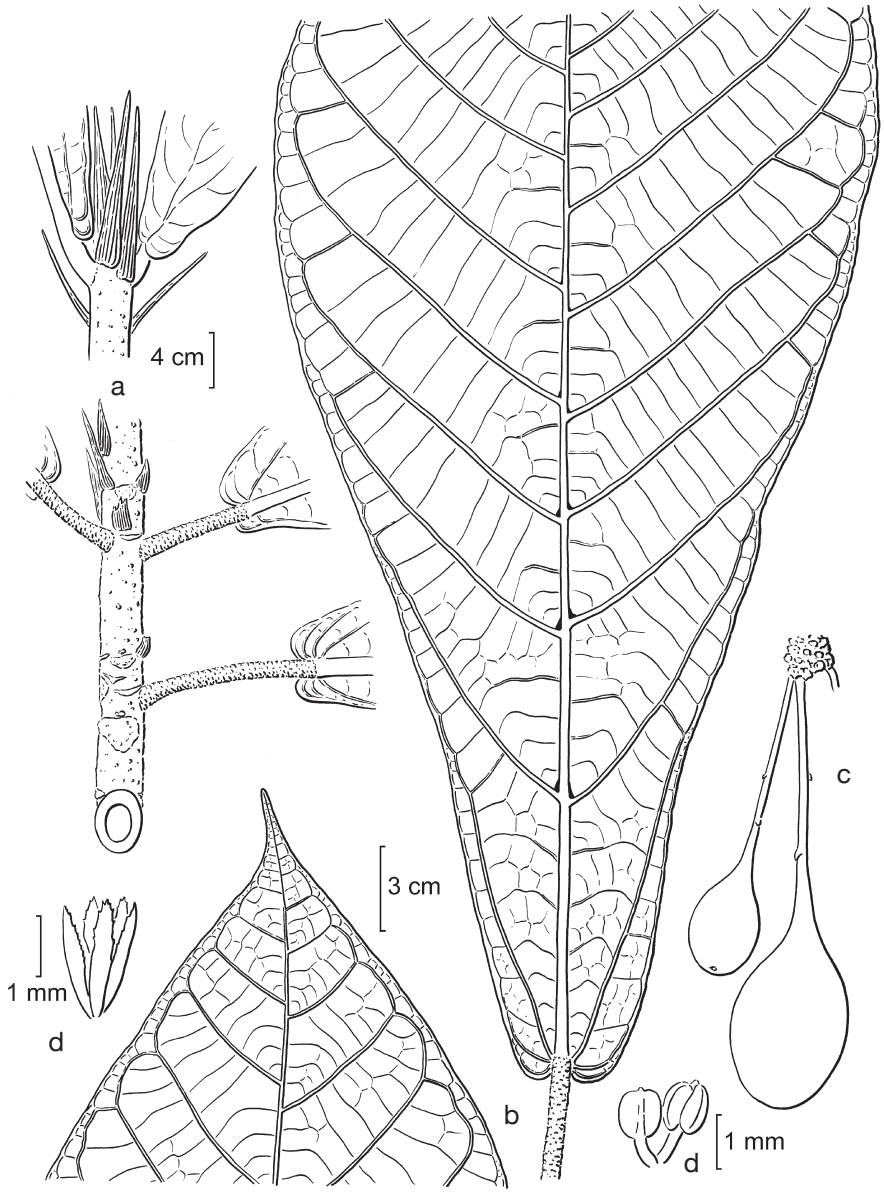


Fig. 48. *Ficus sciaphila* Corner. a. Leafy twigs; b. leaf; c. figs; d. stamens and perianth of staminate flower (*NGF 13780* and *38054*). From Philos. Trans., Ser. B, 259 (1970) 380.

35. **Ficus stellaris** C.C. Berg

Ficus stellaris C.C. Berg, Blumea 48 (2003) 583.

Tree up to 20(–40) m tall (or shrub). *Branchlets* drying dark (red-)brown to blackish. *Leafy twigs* 1.5–2.5 mm thick, minutely whitish hispidulous, scabrous; internodes solid or hollow. *Leaves* distichous; lamina elliptic to ovate, 2–12(–16) by 2–7(–8) cm, ± asymmetric, (sub)coriaceous, apex acuminate to subacute, base ± inequilateral, truncate (to subcordate) to subcuneate, margin irregularly crenate-dent(icul)ate to subentire, usually ± revolute; upper surface minutely hispidulous, scabrous, lower surface minutely hispidulous on the veins, or also very sparsely strigillose on the midrib, scabrous; cystoliths on both sides; lateral veins 3–7(–9) pairs, the basal pair up to 1/4–1/2 the length of the lamina, these and mostly also other lateral veins branched or furcate, tertiary venation scalariform, slightly prominent but the smaller to almost flat beneath; waxy glands in the axils of both basal lateral veins; petiole 0.5–1.5(–2) cm long, slightly different to almost equal in length on the same twig, minutely hispidulous, epidermis persistent; stipules semi-amplexicaul, 0.4–0.6 cm long, minutely hispidulous and ciliolate, caducous. *Figs* axillary or just below the leaves, solitary or in pairs; peduncle 0.2–1 cm long; peduncular bracts 3, scattered or verticillate, 1–2 mm long; receptacle (sub)globose, 0.3–0.6 or (0.5–)0.7–1.2 cm diam. when dry, minutely hispidulous, scabridulous, often with few 0.5–1 mm long lateral bracts, yellow to orange at maturity, apex convex, ostiole 1.5–3 mm diam., surrounded by a low rim; internal hairs abundant. *Tepals* dark red or pinkish, hairy at the apices or glabrous. *Styles* glabrous or hairy. *Fruits* ± tuberculate.

Distribution — New Guinea.

Notes — 1. This species has been confused with both *F. trachypison* and *F. melinocarpa*. It can be distinguished from the former by the absence of additional waxy glands in the axils of lateral veins others than the basal ones (and the relatively large figs) and from the latter by the semi-amplexicaul stipules (and the always scabrous lower and upper surface of the lamina).

2. This species also show similarities to *F. leptodictya* and *F. pseudowassa*.

3. Two subspecies can be distinguished.

a. subsp. **stellaris**

Figs mostly in the leaf axils, the receptacle relatively large (usually 0.7–1.2 cm diam. when dry), and the peduncle relatively long (0.2–1 cm). *Tepals* dark red and glabrous.

Distribution — New Guinea (eastern).

Habitat — Forest (as oak forest); at altitudes between 1200 and 2300 m.

b. subsp. **pallida** (Corner) C.C. Berg

Ficus stellaris C.C. Berg subsp. *pallida* (Corner) C.C. Berg, Blumea 48 (2003) 585. — *Ficus trachypison* K. Schum. var. *pallida* Corner, Gard. Bull. Singapore 17 (1960) 462; Philos. Trans., Ser. B, 253 (1967) 98.

Figs mostly below the leaves, the receptacle small (0.3–0.6 cm diam. when dry) and the peduncle relatively short (0.2–0.3 cm long). *Tepals* pinkish and hairy.

Distribution — New Guinea (eastern).

Habitat — River banks (as bushy tree), river beds (as shrub), rocky surfaces, or forest pockets in grassland; at altitudes up to 100 m.

36. Ficus subsidens Corner

Ficus subsidens Corner, Gard. Bull. Singapore 17 (1960) 454; 21 (1965) 64; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 235.

Shrub, decumbent, creeping, or scandent, laxly branched. *Leafy twigs* 3–4 mm thick, (very) sparsely whitish minutely hispidulous, scabridulous to smooth; internodes hol-

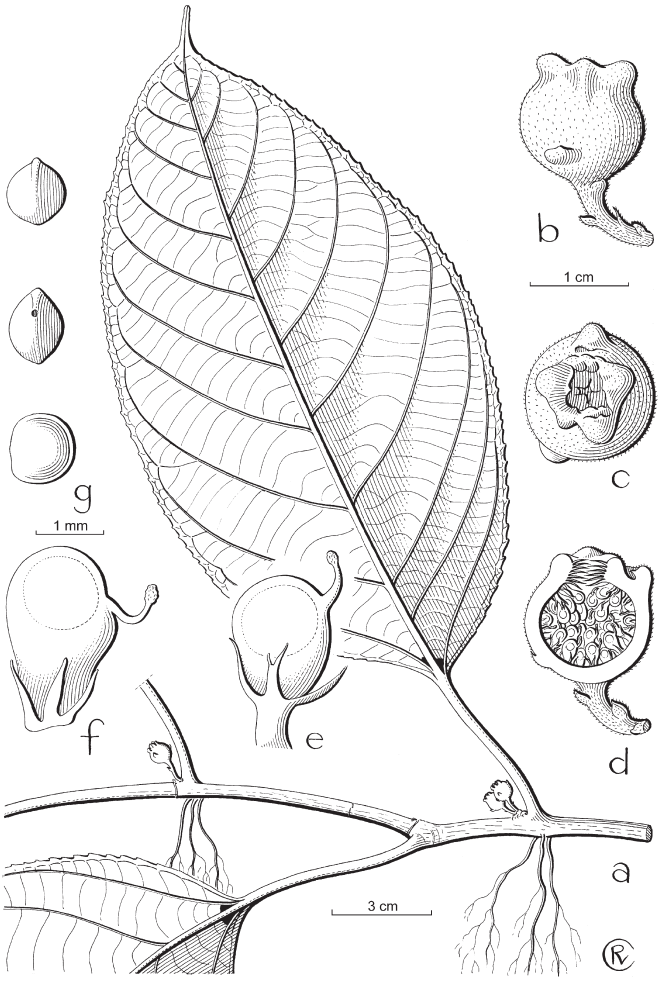


Fig. 49. *Ficus subsidens* Corner. a. Leafy twig with figs; b. fig; c. ostiole; d. fig; e, f. long-styled flowers; g. fruits (all: *SF 26443*).

low. *Leaves* spirally arranged; lamina elliptic, 17–22 by 9–11.5 cm, symmetric, chartaceous, apex shortly acuminate, base widely cuneate, margin (closely) denticulate; upper surface minutely hispidulous, scabrous, lower surface sparsely to densely whitish (sub)hispidulous on the veins, scabrous; cystoliths (or cystolith hairs) on both sides; lateral veins 9–11 pairs, the basal pair up to 1/4–1/3 the length of the lamina, these and also some of the lower lateral veins branched or furcate, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins or also smaller ones in the axils of other lateral veins; petiole 3–7 cm long, slightly different to almost equal in length on the same twig, (very) sparsely minutely puberulous, the epidermis persistent; stipules not seen, semi-amplexicaul, caducous. *Figs* axillary and below the leaves (also on creeping stems or branches), solitary or up to 0.5 cm long short-shoots; peduncle 0.3–0.8 cm long; peduncular bracts 2 or 3, scattered, 0.5–1 mm long; receptacle (sub)globose, 0.5–0.8 cm diam. when dry, 1–1.1 cm diam. when fresh, hispidulous and scabrous with few c. 1 mm long lateral bracts, rose-red at maturity, apex ± convex, ostiole 2–3 mm diam., surrounded by a distinctly lobate rim; internal hairs absent. *Tepals* whitish, glabrous. *Styles* glabrous. *Fruits* lens-shaped, 1–1.2 mm long, smooth, weakly keeled. — **Fig. 49; Map 5.**

Distribution — Borneo (northern: Mt Kinabalu).

Habitat — Rocks in stream beds, at c. 1500 m.

Notes — 1. This species is very similar to *F. montana* and it is doubtful whether it should be maintained as distinct, considering the variation within *F. montana*. There are three differences: a finely and regularly denticulate margin of the lamina in *F. subsidens* versus an entire or coarsely crenate-dentate margin in *F. montana*, a relatively wide ostiole (2.5–3 mm diam.) surrounded by a distinctly lobate rim in *F. subsidens* versus a smaller ostiole (c. 1 mm diam.) surrounded by a faintly lobate rim in *F. montana*, and smooth endocarp bodies in *F. subsidens* versus tuberculate ones in *F. montana*.

2. The smooth endocarp body is remarkable. It looks similar to the fruits (achenes) of the majority of the species of sect. *Sycidium*. These bodies are released from the drupelet, a feature characteristic for species of the *F. montana*-group (see p. 209).

37. Ficus tenuicuspidata Corner

Ficus tenuicuspidata Corner, Gard. Bull. Singapore 17 (1960) 464; 21 (1965) 69.

Tree. *Branchlets* drying dark brown. *Leafy twigs* 1–1.5 mm thick, glabrous, smooth. *Leaves* distichous; lamina oblong, 6–10 by 2–3.5 cm, (almost) symmetric, subcoriaceous, apex caudate, base (almost) equilateral, cuneate (to obtuse), margin entire; both surfaces glabrous, smooth; cystoliths on both sides; lateral veins 6–8 pairs, the basal pair running close to the margin, up to c. 1/10 the length of the lamina, unbranched, other lateral veins often furcate far from the margin, tertiary venation (sub)scalariform to (sub)reticulate; waxy glands in the axils of both basal lateral veins, usually not entirely opposite; petiole 0.2–0.4 cm long, slightly different to almost equal in length on the same twig, glabrous, the epidermis persistent; stipules amplexicaul 0.6–0.8 cm long, glabrous, caducous. *Figs* axillary, solitary; peduncle c. 0.5 cm long; peduncular bracts 1–3, scattered or 2 (sub)opposite, c. 0.5 mm long; receptacle (sub)globose, 0.8–1.2 cm diam. when dry, minutely hispidulous, scabridulous, without lateral bracts,

at maturity orange-yellow, apex convex, ostiole 1.5–2 mm diam., surrounded by a low rim; the wall sometimes thick; internal hairs abundant. *Tepals* dark red, minutely hairy at the apices. *Styles* glabrous. — **Map 6.**

Distribution — Celebes.

Habitat — Forest, at c. 2000 m.

Notes — 1. Corner (1960, 1965) recognized var. *major*, based on a collection from the Philippines (Mindanao), which, however, readily matches other collections with a caudate lamina from the same area and in the present treatment referred to the caudate form of *F. ampelas*, in particular the large-leaved subform.

2. This small leaved species (only known from the type) clearly differs from the form with caudate laminas of *F. ampelas* (in the Philippines) in the leaf venation.

38. Ficus tonsa Miq.

Ficus tonsa Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 234, 297; King, Sp. Ficus 2 (1888) 185; Corner, Gard. Bull. Singapore 17 (1960) 463; 21 (1965) 68.

Tree up to 11 m tall; milksap (sometimes?) absent. *Branchlets* often drying (red-) brown, the periderm flaking off inconspicuously. *Leafy twigs* 1.5–3 mm thick, glabrous, smooth; internodes solid. *Leaves* in lax spirals to distichous; lamina elliptic to oblong to subobovate, (5–)8–22(–25) by 3.5–10(–14) cm, (almost) symmetric to ± asymmetric, (sub)coriaceous, apex shortly and often ± abruptly acuminate to rounded (to subacute), base cuneate to rounded, margin entire to weakly crenate-dentate, often ± revolute; both surfaces glabrous, smooth (to scabridulous); cystoliths only beneath; lateral veins often slightly impressed above; lateral veins 6–11 pairs, the basal pair running close to the margin, up to 1/6–1/2 the length of the lamina, unbranched, sometimes one of the upper lateral veins furcate, tertiary venation regularly scalariform; waxy glands in the axils of both basal lateral veins; petiole 0.8–2 cm long, slightly different to almost equal in length on the same twig, glabrous, the epidermis persistent; stipules semi-amplexicaul, 0.3–0.5 cm long, ciliolate, caducous. *Figs* axillary or just below the leaves, solitary or in pairs; peduncle 0.5–1.2 cm long; peduncular bracts 2 or 3, scattered, 2 (sub)opposite or 3 (almost) verticillate, 0.5–1 mm long; receptacle (sub)globose, 0.8–1.4 cm diam. when dry, 1.5–2 cm diam. when fresh, glabrous, punctate, smooth, without lateral bracts, yellow to dark red at maturity, apex convex to slightly umbonate, ostiole 1.5–2 mm diam., surrounded by a low rim; internal hairs abundant, brownish, relatively long. *Tepals* dark red, minutely hairy at the apices. *Styles* hairy. — **Map 6.**

Distribution — Celebes (northern, incl. Sangi Islands, and central) and Moluccas (Talaud Islands).

Habitat — Forest, at altitudes up to 1000 m.

Note — This species is apparently closely related to *F. leptodictya* from eastern New Guinea, which has been reduced to a variety of *F. tonsa* by Corner (1960).

39. Ficus trachypison K. Schum.

Ficus trachypison K. Schum., Fl. Schutzgeb. Südsee (1901) 280; Diels, Bot. Jahrb. Syst. 67 (1935) 199; Summerh., J. Arnold Arbor. 22 (1941) 91; Corner, Gard. Bull. Singapore 21 (1965) 68; Philos. Trans., Ser. B, 253 (1967) 97, t. 27.

Ficus lima Lauterb. & K. Schum., Fl. Schutzgeb. Südsee (1901) 269; Diels, Bot. Jahrb. Syst. 67 (1935) 207.

Ficus pteleaephylla S. Moore, J. Bot. 61, Suppl. (1923) 49; Diels, Bot. Jahrb. Syst. 67 (1935) 207.

Ficus xanthosyce Summerh., J. Arnold Arbor. 10 (1929) 144; 22 (1941) 95; Diels, Bot. Jahrb. Syst. 67 (1935) 206.

Tree up to 30 m tall, slightly buttressed, deciduous (?). *Branchlets* often drying dark (red-)brown. *Leafy twigs* 2–4 mm thick, white to brownish (to dark brown) puberulous to subhispidulous to subhirtellous (or subtomentose to subvelutinous), smooth to scabridulous; internodes solid or hollow. *Leaves* distichous; lamina elliptic to oblong (to subovate), (3–)5–15(–27) by 3.5–10(–13) cm, ± asymmetric, chartaceous (to subcoriaceous), apex short-acuminate to obtuse, base ± inequilateral, subcordate to rounded to obtuse (to cuneate), margin irregularly crenate-denticulate to subentire, usually ± revolute; upper surface hispidulous to puberulous on the veins, scabrous, often ± bullate, lower surface densely to sparsely whitish (to pale brown) puberulous to subtomentose to (sub)hispidulous on the veins, scabrous to smooth; cystoliths on both sides; lateral veins (4–)7–10 pairs, the basal pair up to 1/4–1/2 the length of the lamina, these and mostly also other lateral veins branched or furcate, tertiary venation scalariform, tertiary and smaller veins prominent beneath; waxy glands in the axils of both basal lateral veins and smaller ones in the axils of the other lateral veins; petiole 0.5–1.5(–2) cm long, slightly different to almost equal in length on the same twig, sparsely to densely whitish (to pale brown) puberulous to (sub)hispidulous (or subtomentose to subvelutinous), the epidermis persistent; stipules semi-amplexicaul, 0.4–1 cm long, appressed-puberulous to strigillose, caducous. *Figs* axillary or just below the leaves, solitary or in pairs, or also in clusters on short-shoots on older wood; peduncle 0.2–1 cm long; peduncular bracts (2 or) 3, scattered or 2 (sub)opposite (or 3 verticillate), 0.5–1 mm long; receptacle (sub)globose, 0.4–0.8 cm diam. when dry, 0.8–1.2 cm diam. when fresh, minutely hispidulous, the hairs with a swollen base, scabrous, often with few 0.5–1 mm long lateral bracts, yellow to orange to red to purple at maturity, apex convex, ostiole 1–1.5 mm diam.; internal hairs abundant. *Tepals* dark to pale red, glabrous or hairy at the apices. *Styles* glabrous or hairy. — **Fig. 50; Map 6.**

Distribution — Celebes (Minahassa), Moluccas (Ambon, Kai Islands, Aru Islands), New Guinea.

Habitat — Forest and secondary growth, at altitudes up to 1300 m.

Uses — The figs are eaten and the bark is used for cloth.

Notes — 1. This species can be distinguished from *F. stellaris* by the presence of additional waxy glandular spots in the axils of lateral veins others than the basal ones, the small fig receptacle (0.4–0.8 cm diam. when dry), the figs often occurring in clusters on short-shoots (far) below the leaves, the longer and often softer indumentum on leafy twigs and the lamina beneath. Only the collections from Celebes and the Moluccas match the short indumentum characteristic for *F. stellaris*. Moreover, *F. trachypison* is a lowland species, whereas *F. stellaris* mostly occur at altitudes between 1200 and 2300 m, or at low elevations (below 100 m) on river banks or in rivers beds, or rocky surfaces.

2. *Ficus trachypison* var. *pallida* Corner (1960) is currently included in *F. ampelas*.

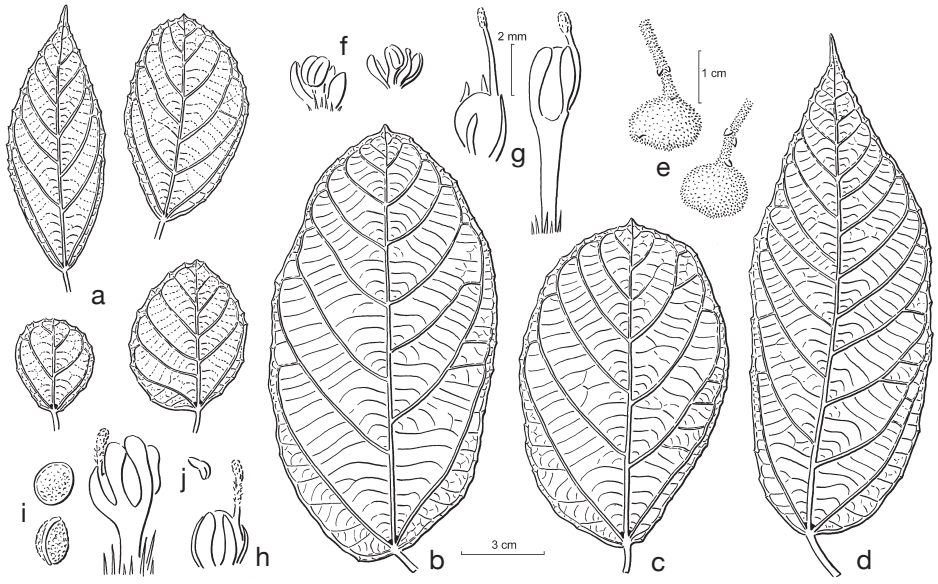


Fig. 50. *Ficus trachypison* K. Schum. a. Leaves (small); b–d. leaves; e. figs; f. staminate flowers; g. long-styled flowers with glabrous styles; h. long-styled flowers with hairy styles; i. fruits; j. embryo (a: *Carr 14844*; b, f: *Carr 12279*; c, e, g: *Carr 14736*; d: *Carr 16075*; h–j: *Carr 15788*). From Philos. Trans., Ser. B, 253 (1967) 97.

3. This species shows close affinities to *F. quercetorum* and *F. macrorrhyncha* (as discussed under the former), as well as affinities to *F. melinocarpa*.

4. Collection *Millar NGF 22737* (from New Guinea, Morobe Province) is not included in the description. It is distinct in the larger receptacle, 1.2–1.5 cm diam. when dry, covered with dense white tomentose indumentum and with a 2–2.5 cm wide ostiole; it might represent an undescribed species.

40. Ficus ulmifolia Lam.

Ficus ulmifolia Lam., Encycl. 2, 2 (1788) 499; Vahl, Enum. Pl. 2 (1805) 197; Willd., Sp. Pl. 4 (1806) 1152; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 254; Miq., London J. Bot. 7 (1848) 234; Fl. Ind. Bat. 1, 2 (1859) 299; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; King, Sp. Ficus 2 (1888) 185; Merr., Philipp. J. Sci., Bot. 3 (1908) 403; Fl. Manila (1912) 174; Sp. Blancoan. (1918) 128; W.H. Br., Bull. Bur. For. Philipp. 21 (1920) 47; 22 (1921) 269; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 67; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 239; Tubangui & Basaca, Philipp. J. Sci. 77 (1947) 19 (latex anthelminthic); Corner, Gard. Bull. Singapore 21 (1965) 66. — *Covellia ulmifolia* (Lam.) Gasp., Giorn. Bot. Ital. 2 (1844) 218; Rendiconti Reale Accad. Sci. Fis. 25 (1845) 85; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 347.

Ficus difformis Lam., Encycl. 2, 2 (1788) 500; Miq., London J. Bot. 7 (1848) 234; Fl. Ind. Bat. 1, 2 (1859) 298; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291 (haud 271 = *F. wassa* Roxb.); Náves & Fern.-Vill., Nov. App. (1880) 200; King, Sp. Ficus 2 (1888) 181.

Ficus hispida Blanco, Fl. Filip. (1837) 685, non L.f. 1782.

Ficus hispida Blanco var. *hastata* Blanco, Fl. Filip. (1837) 685.

Ficus hispida Blanco var. *linearis* Blanco, Fl. Filip. (1837) 685.

Ficus heterophylla Blanco, Fl. Filip. (1837) 185, non L.f. 1782.
Ficus sinuosa Miq., London J. Bot. 7 (1848) 232; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; Rolfe, J. Bot. 23 (1885) 215; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 254; Merr., Philipp. J. Sci., 1, Suppl. (1906) 45; Elmer, Leafl. Philipp. Bot. 1 (1907) 251. — *Ficus ulmifolia* Lam. forma *sinuosa* (Miq.) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 283.
Ficus sinuosa Miq. var. *integrifolia* Miq., London J. Bot. 7 (1848) 232.
Ficus blepharostoma Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 197; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 47; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 241.
Ficus sparsifolia Merr., Philipp. J. Sci. 18 (1921) 64; Enum. Philipp. Flow. Pl. 2 (1923) 65; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 83.
Ficus velascoi Merr. ex Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 242, 275.
Ficus ulmifolia Lam. forma *integra* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 283.
Ficus quercifolia auct. non Roxb.: Náves & Fern.-Vill., Nov. App. (1880) 200; A. Usteri, Beitr. Kenntnis Philipp. (1905) 127; Merr., Bull. Bur. For. Philipp. 1 (1903) 18; Elmer, Leafl. Philipp. Bot. 1 (1907) 251.
Ficus asperrima auct. non Roxb.: Elmer, Leafl. Philipp. Bot. 1 (1906) 53.

Shrub or tree up to 6 m tall. *Branchlets* often drying red-brown; often with short (abortive) branchlets with short internodes and with minute leaves or without leaves. *Leafy twigs* 2–5 mm thick, whitish hispidulous to puberulous, ± scabrous; internodes

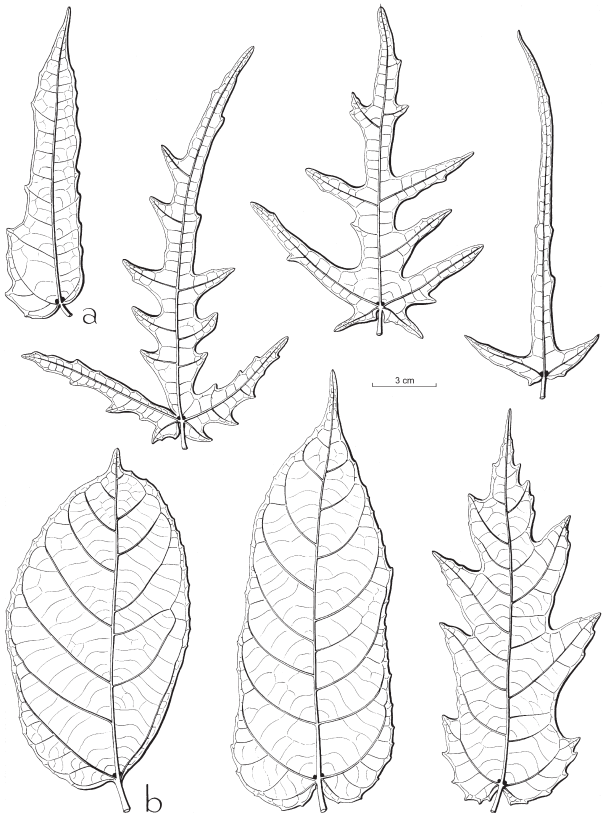


Fig. 51. *Ficus ulmifolia* Lam. a, b. Leaf variation (a: *Pancho s.n.*; b: *Cuming 1924*).

hollow. *Leaves* distichous, rarely subopposite; lamina oblong to elliptic to (sub)ovate, (2–)5–18(–23) by (1.5–)3–6.5(–10) cm, usually slightly asymmetric to almost symmetric, sometimes distinctly asymmetric, subcoriaceous (to chartaceous), apex acuminate, base ± inequilateral, subcordate to cuneate, margin irregularly crenate-dent(icul)ate to (sub)lobate or subentire (when juvenile 3-lobate, sometimes with a linear midsegment); upper surface (sparsely) hispidulous, scabrous (to scabridulous), lower surface sparsely hispidulous on the (main) veins, ± scabrous; cystoliths on both sides; lateral veins (3–)4–7(–9, or when juvenile and with a linear midsegment to c. 20) pairs, the basal pair up to 1/4–1/2 the length of the lamina, (at least) at the broad side branched, tertiary venation (laxly) scalariform; waxy glands in the axils of both basal lateral veins; petiole (0.5–)1–3 or 0.5–0.8 cm long, slightly different to almost equal in length on the same twig, hispidulous, the epidermis persistent; stipules semi-amplexicaul, 0.3–0.8 cm long, minutely puberulous to glabrous, caducous. *Figs* axillary, solitary or in pairs (also ramiflorous?); peduncle 0.2–1.5 cm long; peduncular bracts 2 or 3, mostly scattered, 0.5–1 mm long; receptacle subglobose, 0.8–1.3 or 0.5–0.8 cm diam. when dry, hispidulous, scabrous, sometimes with a lateral bract, yellow to red at maturity, apex convex, ostiole c. 2 mm diam., with apical bracts and narrow ostiolar bracts pointing upwards; internal hairs few to abundant. *Tepals* whitish to pinkish, glabrous. *Styles* glabrous. — **Fig. 51; Map 3.**

Distribution — Philippines (widespread, not in Mindanao and Palawan?).

Habitat — Forest (in rocky places) and in secondary growth, at low altitudes.

Notes — 1. A number of collections from Luzon (near Santa Cruz in gallery forest or secondary growth, on extreme ultrabasic soil with grassland) are distinct in the smaller figs (0.5–0.8 cm diam. when dry), shorter petioles (less than 1 cm long), and the leaves drying pale green. The collections might represent a distinct infraspecific entity (an ecotype?).

2. This form has also some features in common with *F. cumingii*, as the occasional opposite leaves and the narrow laminas, lobate at the base; these features may indicate that *F. ulmifolia* and *F. cumingii* are closely related.

41. Ficus wassa Roxb.

Ficus wassa Roxb., Fl. Ind., ed. Carey 3 (1832) 539; Wight, Ic. 2 (1843) t. 666; Miq., Fl. Ind. Bat. 1, 2 (1859) 298; Merr., Int. Rumph. (1917) 193; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 578; Corner, Gard. Bull. Singapore 17 (1960) 455; 21 (1965) 65; Philos. Trans., Ser. B, 253 (1967) 94, f. 25.

Ficus ampelas Burm.f. var. *obversifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272. — *Ficus wassa* Roxb. var. *obversifolia* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 456.

Ficus duriuscula King, Sp. Ficus 2 (1888) 155, t. 195; emend. K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 244 (p.p., *Beccari PP 188*; the other part, *Forbes NG 765 = F. hystricicarpa* Warb.); Diels, Bot. Jahrb. Syst. 67 (1935) 207; Summerh., J. Arnold Arbor. 22 (1941) 95.

Ficus lamprophylla Lauterb. & K. Schum., Fl. Schutzgeb. Südsee (1901) 271; Diels, Bot. Jahrb. Syst. 67 (1936) 207.

Ficus eulampra K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 279; Summerh., J. Arnold Arbor. 10 (1929) 147; Diels, Bot. Jahrb. Syst. 67 (1935) 207.

Ficus hystricicarpa Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 244; Summerh., J. Arnold Arbor. 10 (1929) 147; Diels, Bot. Jahrb. Syst. 67 (1935) 199; Summerh., J. Arnold Arbor. 22 (1941) 92; Corner, Gard. Bull. Singapore 21 (1965) 65.

Ficus portus-finschii Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 250; Diels, Bot. Jahrb. Syst. 67 (1935) 207.
Ficus reticulatissima S. Moore, J. Bot. 63, Suppl. (1925) 108.
Ficus rhodocarpa Summerh., J. Arnold Arbor. 10 (1929) 150; Diels, Bot. Jahrb. Syst. 67 (1935) 207.
Ficus anggica Diels, Bot. Jahrb. Syst. 67 (1935) 198.
Ficus nubigena Diels, Bot. Jahrb. Syst. 67 (1935) 209. — *Ficus wassa* Roxb. var. *nubigena* (Diels) Corner, Gard. Bull. Singapore 17 (1960) 455.
Ficus carolii Diels, Bot. Jahrb. Syst. 67 (1935) 200; Summerh., J. Arnold Arbor. 22 (1941) 92.
Ficus difformis auct. non Lam.: Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 271, 291.
Ficus copiosa auct. non Steud.: Summerh., J. Arnold Arbor. 13 (1932) 102.

Shrub or tree up to 10(–15) m tall. *Leafy twigs* 2–4 mm thick, sparsely whitish hispidulous and ± scabrous; internodes mostly hollow. *Leaves* mostly spirally arranged or less commonly (sub)opposite or subverticillate; lamina oblong to elliptic (to (sub)obovate or to lanceolate), (3–)6–20(–26) by (1.5–)3–8(–10) cm, symmetric or slightly asymmetric, subcoriaceous, apex acuminate, base cuneate to rounded (to cordate), margin entire to coarsely crenate-dentate (to lobate when juvenile), often ± revolute; upper surface sparsely hispidulous, scabridulous to almost smooth, lower surface (very) sparsely whitish hispidulous on the main veins, ± scabrous; cystoliths on both sides, upper and lower surface mostly drying different in colour, usually (darker) brown beneath, often shining above; lateral veins (3–)4–9 pairs, the basal pair running close to the margin, up to (1/5–)1/4–1/3 the length of the lamina, mostly unbranched, tertiary venation (laxly) scalariform (to subreticulate); waxy glands in the axils of both basal lateral veins or sometimes also smaller ones in the axils of other lateral veins; petiole 0.5–2(–4.5) cm long, usually distinctly different in length on the same twig, (very) sparsely whitish hispidulous, the epidermis persistent or flaking off over the whole length or only at the base; stipules lateral, almost subulate, stiff and ± distinctly keeled, and often finely striate, 0.5–1 cm long, glabrous or appressed-puberulous, caducous or subpersistent; on twig apices often tufts of (sub)persistent stipules. *Figs* axillary, solitary, mostly ramiflorous to cauliflorous, on (clusters of) spurs and up to 3 cm leafless branchlets with short internodes, down to the trunk; peduncle 0.5–2(–3.5) cm long; peduncular bracts 1–3, 0.5–1 mm long; receptacle (sub)globose, 0.5–1.3(–2) cm diam. when dry, 1.5–2(–3) cm diam. when fresh, (sparsely) hispidulous or subhispid, the rigid hairs with swollen bases, or puberulous as well, ± scabrous (or smooth), (usually) with few 0.5–1 mm long lateral bracts, yellow or red or purple at maturity, apex ± convex, ostiole 1–1.5 mm diam., surrounded by a low to high rim; internal hairs minute, few or absent. *Tepals* whitish to reddish, (sparsely) hairy at the apices or glabrous. *Styles* glabrous. — **Fig. 40h–l; Map 5.**

Distribution — From Malesia to the Solomon Islands, New Hebrides; in *Malesia*: Lesser Sunda Islands (Flores, Alor, Timor), Moluccas (Mototai, Halmahera, Obi Islands), New Guinea (incl. New Britain).

Habitat — Forest and secondary growth, at altitudes up to 2600(–3000) m; often grown in villages.

Uses — Young shoots and figs eaten, raw or cooked; bark is used for medicinal purposes.

Notes — 1. The species is quite variable, in particular in leaf characters in the altitudinal range from sea level to 3000 m. At altitudes between 1300 and 3000 m, the

material recognized as var. *nubigena* is found. It differs more or less clearly from that from the lowlands. The leaves are more often (sub)opposite, the petiole is often short (up to 1 cm long) and its epidermis is usually flaking off, the stipules are more often subpersistent, and the number of lateral veins tend to be smaller, mostly up to 6 pairs. However, the high altitude collections are not so clearly distinct that recognition of an infraspecific entity appears to be justified as it cannot be keyed out by any (combination) of the differences listed.

2. Although the epidermis of the petiole is normally persistent in lowland material, it sometimes flakes off at the basal part of the petiole or occasionally over its whole length. In the Solomon Islands, the epidermis of the petiole may flake off both at the basal and upper part. In this respect it resembles *F. copiosa*, but it can be readily distinguished by the shorter petioles and stipules, and the smaller figs.

3. Some collections (recognized by Corner as *F. hystricicarpa*) have more densely hispidulous to subhispid figs. As suggested by Corner, these collections (made from sea level up to 3000 m) appear to represent only a form of *F. wassa*.

4. Waxy glands are found only in the axils of the basal lateral veins in the majority of the collections, but in some collections from New Guinea such glands also occur in the axils of other lateral veins. These collections tend to have (almost) smooth laminas and short petioles.

5. The material from the New Hebrides identified as *F. wassa* by Corner deviates somewhat from the material from the Solomon Islands, as in the clear tendency towards a subcordate base of the lamina and a slightly sunken ostiole, not surrounded by a distinct rim.

6. The leaves are rather frequently subverticillate.

7. This species is closely related to *F. copiosa*, from which it can be distinguished by the cuneate to rounded lamina base (in *F. copiosa* being usually cordate to subcordate), the shorter petioles, mostly up to 2.5 cm long (in *F. copiosa* in most collections longer than 4 cm) and their less strongly difference in length, mostly not more than 1 : 2.

Section Palaeomorphe

Ficus L. subg. *Sycidium* (Miq.) Mildbr. & Burret sect. *Palaeomorphe* King, Sp. Ficus 1 (1887) 1, 3. — *Ficus* L. subg. *Palaeomorphe* (King) Sata, J. Soc. Trop. Agr. Taiwan 6 (1934) 26; Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 217. — *Ficus* L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Palaeomorphe* (King) Corner, Gard. Bull. Singapore 17 (1960) 446.

Ficus L. sect. *Grossularia* Kuntze in Post & Kuntze, Lex. Gen. Phan. (1904) 236.

Ficus L. sect. *Sycidium* Miq. ser. *Pallidae* Miq., London J. Bot. 7 (1848) 433.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Palaeomorphe* (King) Corner ser. *Pallidae* Miq., London J. Bot. 7 (1848) 433; Corner, Gard. Bull. Singapore 17 (1960) 447.

Ficus L. ser. *Euglabrifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 217, 218, 377.

Ficus L. ser. *Glabriusculifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 217, 220, 378.

Ficus L. ser. *Glabrifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 262, 382.

Ficus L. ser. *Minutuliflorae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 217, 222, 378. — *Ficus* L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Palaeomorphe* (King) Corner ser. *Minutuliflorae* Sata; Corner, Gard. Bull. Singapore 17 (1960) 448.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Palaeomorphe* (King) Corner ser. *Subulatae* Corner, Gard. Bull. Singapore 17 (1960) 447.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Palaeomorphe* (King) Corner ser. *Cuspidatae* Miq., London J. Bot. 7 (1848) 428; Corner, Gard. Bull. Singapore 17 (1960) 448.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Palaeomorphe* (King) Corner ser. *Fibrosifoliae* Corner, Gard. Bull. Singapore 17 (1960) 448.

Lianas (of the straggling type) or creepers, with short adventitious roots on stems and branches (in touch with the substrate), hemi-epiphytes, or terrestrial shrubs or treelets, with continuous growth. *Leafy twigs* solid, ± angular to ± compressed. *Leaves* distichous, asymmetric to symmetric, often smooth above, base mostly inequilateral and at one side decurrent and then often auriculate (or lobed); cystoliths only beneath or on both sides; waxy glands mostly in the axils of one of the basal lateral veins, sometimes of both, smaller glands may occur in the axils of other lateral veins, unilaterally or bilaterally; petiole short; stipules semi-amplexicaul or fully amplexicaul. *Figs* axillary, ramiflorous or cauliflorous; receptacle small, mostly less than 1 cm diam. when dry; lateral bracts mostly absent; internal hairs mostly absent, if present, then mostly sparse and/or short. *Tepals* whitish, pink or red, glabrous or hairy (mostly minutely so at the apices or along the margins). *Staminate flowers* with (gall) pistils or (non-functional) pistillodes. *Styles* sometimes hairy. *Fruits* achenes, lens-shaped and weekly keeled.

Distribution — The section comprises 30 species, all but *F. corneriana* C.C. Berg (2000: 397) endemic to the Solomon Islands, occurring in the Malesian region, and most of them confined to this region.

Delimitation — For the differences between this section and the typical one see under sect. *Sycidium* (p. 207).

Subdivision — Sect. *Palaeomorphe* comprises 29 species, which can be ranked into two major informal subdivisions: the *F. subulata*-group and the *F. tinctoria*-group.

a. *Ficus subulata*-group (ser. *Cuspidatae*, ser. *Fibrosifoliae*, ser. *Minutiflorae*, and ser. *Subulatae*, as recognized by Corner 1960). — This group of essentially lianescent plants is distinctly centred in western Malesia and shows a concentration of species in Borneo, where about 2/3 of the species are found, several of them endemics. Two species are endemic to Sumatra and one to the Philippines. Several species extend to the Asian mainland, including the most widespread species, *F. subulata*, which ranges from Sikkim to the Solomon Islands. Only four species, *F. armiti*, *F. aurita*, *F. funiculicaulis*, and *F. gracillima*, are elements of the eastern part of the Malesian region. They might be more or less closely related.

The *F. subulata*-group comprises 23 Malesian species: *F. armitii*, *F. aurita*, *F. cuspidata*, *F. funiculicaulis*, *F. gracillima*, *F. grewiifolia*, *F. hemsleyana*, *F. heteropleura*, *F. jaheriana*, *F. kuchinensis*, *F. lasiocarpa*, *F. leptocalama*, *F. microsphaera*, *F. midotis*, *F. obscura*, *F. parietalis*, *F. pisifera*, *F. rubrocuspidata*, *F. rubromidotis*, *F. sinuata*, *F. stipata*, *F. subulata*, *F. uniglandulosa*, and *F. corneriana* from the Solomon Islands.

Mesophyll-fibres (see p. 12) are found in the laminas of several species of this group: *F. grewiifolia*, *F. hemsleyana*, *F. jaheriana*, *F. leptocalma*, *F. midotis*, *F. obscura*, *F. pisifera*, *F. rubrocuspidata*, *F. rubromidotis*, and *F. uniglandulosa*; these species have been ranked in ser. *Fibrosifoliae* by Corner (1960, 1965), but the variation patterns in the *F. subulata*-group as a whole do not allow recognition of subgroups. The *F. subulata*-group is rather diverse, as with regard to indumen-

tum, shape and dimensions of the lamina, the venation of the lamina, and the dimensions of the fig receptacle.

b. *Ficus tinctoria*-group (ser. *Pallidae*, as recognized by Corner 1960). — In contrast to the *F. subulata*-group the tree habit is predominant in this group, which is associated with the eastern part of the Malesian region, although the distribution of *F. tinctoria* may indicate that the group originated on the Asian mainland (or in western Malesia). Overall dissimilarities rather than technical ones separate this group from the much larger and variable *F. subulata*-group. The minor differences include the greenish dried laminas and ± stiff stipules, the absence of, or the very sparse, indumentum, and the figs predominantly borne in the leaf axils or just below the leaves. The group comprises four closely related species: *F. celebensis*, *F. inaequifolia*, *F. tinctoria*, and *F. virgata*, and it may include *F. anastomosans* and *F. cauta* as well (see p. 265 and 268). Three of the species can easily be recognized: *F. celebensis* by its narrow leaves, *F. inaequifolia* by the usually relatively large leaves with rather long and abruptly acuminate apices and distinct scalariform venation, and *F. cauta* by the long basal lateral veins. Separating *F. virgata* from *F. tinctoria* (subsp. *tinctoria)* is far less easy (as discussed under the former.

References: Berg, C.C., Ficus corneriana, a new species of Ficus subg. Sycidium sect. Palaeomorphe. Blumea 45 (2000) 397–398. — Corner, E.J.H., Taxonomic notes on Ficus Linn., Asia and Australasia. IV. Subgen. Ficus sect. Sycidium. Gard. Bull. Singapore 17 (1960) 442–485. — Corner, E.J.H., Check-list of Ficus in Asia and Australasia with keys to identification. Gard. Bull. Singapore 21 (1965) 1–186.

42. Ficus anastomosans Wall. ex Kurz

Ficus anastomosans Wall. ex Kurz, For. Fl. Br. Burma 2 (1877) 455. — *Ficus tinctoria* G. Forst. subsp. *parasitica* (Willd.) Corner var. *anastomosans* (Wall. ex Kurz) Corner, Gard. Bull. Singapore 17 (1960) 477.

Ficus ampelas Burm.f. var. *hispidula* Corner, Gard. Bull. Singapore 18 (1961) 89; 21 (1965) 67.

Shrub or treelet, terrestrial. *Branchlets* drying (dark) brown. *Leafy twigs* 1–2 mm thick, rather densely puberulous, smooth; internodes solid. *Leaves* distichous; lamina oblong to elliptic to (sub)ovate, 1–10 by 0.5–4.5 cm, slightly asymmetric to (almost) symmetric, chartaceous to subcoriaceous, apex acute to obtuse, base (almost) equilateral, rounded to obtuse, margin crenate-dentate to sublobate, flat to slightly revolute towards the base; upper surface hispidulous, on the main veins to puberulous, ± scabrous, dull, lower surface sparsely (sub)hispidulous, to puberulous on the main veins, scabrous to almost smooth; cystoliths on both sides; midrib flat above; lateral veins 2–6 pairs, the basal pair running (rather) close to the margin, up to 1/5–1/3 the length of the lamina, unbranched or faintly branched, other lateral veins often furcate far 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,

c. 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 c. 1 mm diam., surrounded by a rim; internal hairs minute and sparse. *Tepals* pinkish, glabrous. *Styles* glabrous.

Distribution — Thailand; in *Malesia*: Celebes (near Pankadjene).

Habitat — Limestone rocks, at low altitudes.

Notes — 1. The three collections from Celebes, *Chin 3471*, *Teijsmann 11905*, and *12242* (the type of *F. ampelas* var. *hispidula*), fully match a number of collections from Thailand, made from shrubs or treelets on limestone. Other collections from Thailand (limestone) and India (Madhya Pradesh) are made from climbers, having larger, ± strongly asymmetric, obliquely (sub)rhomboid laminas, more or less resembling those of *F. tinctoria* subsp. *gibbosa*. As transitional features of the lamina occur, the shrubby and lianescent plants could belong to the same species. The position of this species is not quite clear, as some features point at membership of sect. *Sycidium*, as it shows similarities to *F. ampelas* and *F. goniophylla* as well.

2. This species also resembles somewhat a form of *F. tinctoria* subsp. *tinctoria*, described as *F. fenicis* and *F. swinhoei* from Mindanao (Philippines) and Taiwan, respectively, and characterized by rigidly coriaceous, very scabrous laminas with entire and revolute margins and more numerous lateral veins.

3. In Thailand, the lamina is sometimes distinctly asymmetrical and/or rhomboid.

43. Ficus armitii King

Ficus armitii King, J. Asiat. Soc. Bengal 55, 2 (1887) 404; Sp. Ficus 2 (1889) App. 6, t. 229B; Summerh., J. Arnold Arbor. 10 (1929) 146; Diels, Bot. Jahrb. Syst. 67 (1935) 201; Summerh., J. Arnold Arbor. 22 (1941) 92; Corner, Gard. Bull. Singapore 21 (1965) 361.

Ficus fuscipes Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 245; Diels, Bot. Jahrb. Syst. 67 (1935) 201.

Shrub or treelet up to 6 m tall, often liansecent and/or hemi-epiphytic. *Branchlets* drying brown. *Leafy twigs* 1–3 mm thick, densely brown to yellowish to whitish puberulous to subtomentose or to subhispidulous, smooth to scabridulous; internodes solid. *Leaves* distichous; lamina oblong to elliptic to (sub)ovate (or to lanceolate), (2–)6–17 by (0.7–)1.5–7 cm, somewhat asymmetric, subcoriaceous to chartaceous, apex acuminate to subcaudate, base ± inequilateral (or almost equilateral), (narrowly) cordate to broadly cuneate, one side clearly decurrent and clearly auricled, margin entire or faintly crenate-dentate, flat or slightly revolute; upper surface (sparsely) hispidulous or to puberulous on the midrib, scabrous (to almost smooth), lower surface brownish to yellowish to whitish puberulous to subtomentose or to hispidulous on the veins to subglabrous, smooth (or scabridulous); cystoliths only beneath; midrib prominent above; lateral veins 6–8(–14) pairs, the basal pair up to 1/8–1/4 the length of the lamina, unbranched, usually 1–3 smaller subbasal lateral veins, the other lateral veins also unbranched, tertiary venation scalariform or in small leaves to (sub)reticulate; waxy glands in the axils one of the (main) basal lateral veins (or of both); petiole 0.2–0.6 (–0.8) cm long, densely whitish to yellowish to brownish, puberulous to subtomentose or to hispidulous, the epidermis (±) flaking off; stipules amplexicaul or semi-amplexi-

caul to lateral, 0.3–1 cm long, subsubulate, often the upper part or entirely, (sparsely) whitish puberulous to subhispidulous, caducous or subpersistent. *Figs* axillary, solitary or paired; peduncle 0.1–0.6 cm long; peduncular bracts 1–3, scattered, 2 (sub)opposite, or 3 in a whorl, 0.5–1 mm long, often lanceolate; receptacle (sub)globose, 0.5–0.8 cm diam. when dry, puberulous to subhispidulous or hispidulous, smooth to ± scabrous, without or with some lateral bracts, yellow to orange, pink, or red(-brown) at maturity, apex convex to slightly umbonate, ostiole 1–1.5 mm diam., often surrounded by a low rim, the outer ostiolar bracts sometimes pointing upwards; internal hairs absent. *Tepals* whitish, subulate, indurate, glabrous. *Styles* glabrous.

Distribution — New Guinea (central and eastern).

Habitat & Ecology — Forest, at altitudes up to 1000 m; often epiphytic.

Note — The indurate tepals could indicate that this species is rather closely related to *F. gracillima*.

44. Ficus aurita Reinw. ex Blume

Ficus aurita Reinw. ex Blume, Bijdr. (1825) 462; Miq., Fl. Ind. Bat. 1, 2 (1859) 313; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 274, 292; King, Sp. Ficus 1 (1887) 8, t. 5; Corner, Gard. Bull. Singapore 21 (1965) 77; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 260.

Ficus celebica Blume, Bijdr. (1825) 461; Miq., Fl. Ind. Bat. 1, 2 (1859) 313; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 274, 292; King, Sp. Ficus 1 (1887) 12, t. 10. — *Ficus aurita* Reinw. ex Blume var. *celebica* (Blume) Corner, Gard. Bull. Singapore 17 (1960) 480.

Ficus hispidulosa Elmer, Leafl. Philipp. Bot. 7 (1914) 2401; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 54; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 234.

Ficus auriculifera Merr., Univ. Calif. Publ. Bot. 15 (1929) 46. — *Ficus aurita* Reinw. ex Blume var. *auriculifera* (Merr.) Corner, Gard. Bull. Singapore 17 (1960) 480.

Ficus rostrata auct. non Lam.: Koord., Versl. Minahasa (1898) 607.

Shrub or tree up to 9 m tall, sometimes (?) lianescent and/or hemi-epiphytic. *Branchlets* drying (pale) brown to yellowish, often with (axillary) tufts of small subulate and ciliolate stipules. *Leafy twigs* 1.5–4 mm thick, brown puberulous (with the hairs often ± retrorse) to whitish minutely hispidulous, smooth; internodes solid (or hollow). *Leaves* distichous; lamina oblong to lanceolate to elliptic or to subovate, 6–28(–35) by 2–10(–12.5) cm, ± asymmetric, chartaceous to subcoriaceous, apex caudate (with acumen narrow and often curved) or subcaudate, base inequilateral, rounded to subcordate, one side decurrent and in (relatively) large leaves extended by an up to 1.5 cm long oblong to elliptic and acute lobe with a distinct midrib, in smaller leaves the decurrent side just a strip of mesophyll along the petiole, sometimes auriculate or occasionally extended with an subulate structure, margin subentire to denticulate, mostly ± revolute; upper surface glabrous, smooth, lower surface brown subhirtellous to puberulous to subtomentose or to (sparsely) hispidulous on the veins, smooth to scabridulous; cystoliths only beneath or on both sides; midrib prominent above; lateral veins (7–)10–13(–15) pairs, the basal pair up to 1/10–1/6(–1/2) the length of the lamina, unbranched or faintly branched, the other lateral veins usually unbranched, tertiary venation scalariform, in small leaves to subreticulate; waxy glands in the axils of one of the basal lateral veins; petiole 0.2–1(–1.3) cm long, puberulous to subtomentose to hispidulous, the epidermis (±) flaking off; stipules semi-amplexicaul, 0.3–0.8

or (0.5–)1–2.3 cm long, brownish puberulous to strigillose, striate, subpersistent or caducous. *Figs* axillary or just below the leaves, solitary or paired; peduncle 0.1–0.2 or 0.2–0.5 cm long; peduncular bracts 2 or 3, scattered, but mostly at the base, c. 0.5 mm long; receptacle (sub)globose, 0.3–0.6 or 0.6–0.8 cm diam. when dry, sparsely puberulous to subhispidulous to subglabrous, smooth to scabridulous, sometimes with some lateral bracts, orange to red at maturity, apex convex to slightly umbonate, ostiole c. 1.5 mm diam., surrounded by a lobed/bracteate rim; internal hairs absent. *Tepals* whitish, glabrous. *Styles* glabrous.

Distribution — Borneo, Philippines (Samar, Leyte, Mindanao), Celebes, Moluccas (Moratai, Halmahera, Buru, Ambon, Nusa Laut, Aru Islands), New Guinea (western).

Habitat — Forest, at altitudes up to 1200 m.

Notes — 1. The laminas often have cystoliths on both sides.

2. The characteristic extension of the decurrent side of the base of the lamina is usually present in relatively large leaves, as common in the material from New Guinea and the Moluccas but it is less common elsewhere. The lobe is rarely present in small-leaved material, sometimes it is reduced to a subulate structure. The decurrent base is often just a strip of mesophyll along the petiole or a small auricle. The size of the leaves is to some extend linked to the length of the stipules, but material with short (and caducous) stipules and relatively large leaves, with or without a clear lobe, can be found in Borneo and the Philippines. On the basis of these differences two far from clear-cut forms can be distinguished:

a. *Stipules* (0.5–)1–2.3 cm long, subpersistent. *Lamina* mostly relatively large and the decurrent base of the lamina often extended by an up to 1.5 cm long lobe; lateral veins mostly 10–13(–15) pairs. *Fig peduncle* 0.2–0.5 mm long; receptacle 0.6–0.8 cm diam. when dry (var. *aurita*). — Moluccas (incl. Aru Islands) and New Guinea.

b. *Stipules* 0.3–0.8(–1) cm long, mostly caducous. *Lamina* mostly relatively small and the decurrent side of the lamina base without (a distinct) lobe; lateral veins often 6–9 pairs. *Fig peduncle* 0.1–0.2(–4) cm long; receptacle 0.3–0.6 cm diam. when dry (var. *auriculifera*). — Philippines, Borneo, Celebes. — The material from Celebes is clearly brown-hairy, whereas the indumentum is sparse and inconspicuous in material from the Philippines and Borneo.

3. In some of the collections from Celebes the basal lateral veins extend to 1/2 of the length of the lamina, whereas usually up to 1/6 the length.

45. **Ficus cauta** Corner

Ficus cauta Corner, Gard. Bull. Singapore 17 (1960) 461; 21 (1965) 68.

Tree up to 15 m tall. *Branchlets* pale brown to yellowish. *Leafy twigs* 1–2 mm thick, glabrous, smooth; internodes solid. *Leaves* distichous; lamina subobovate to obovate to elliptic, 8–20 by 3–8 cm, (almost) symmetric, subcoriaceous to coriaceous, apex acuminate, base ± (almost) equilateral, cuneate, margin entire or irregularly coarsely crenate-dentate to sublobate; both surfaces glabrous, smooth; cystoliths on both sides;

lateral veins 4–6(–7) pairs, the basal pair running close to the margin, up to 1/3–1/2 the length of the lamina, unbranched, tertiary venation (laxly) (sub)scalariform to subreticulate; waxy glands in the axils of (usually) one of the basal lateral veins or also in those of other lateral veins; petiole (0.5–)1–2 cm long, glabrous, the epidermis persistent; stipules amplexicaul, 0.5–1.5 cm long, glabrous or (minutely) puberulous or only ciliolate, caducous. *Figs* axillary, solitary; peduncle 0.8–1.6 cm long; peduncular bracts 2 or 3, scattered or 2 (sub)opposite, 0.5–1 mm long; receptacle (sub)globose (to subpyriform), 0.8–1.3 cm diam. when dry, glabrous, smooth, without lateral bracts, colour at maturity unknown, apex convex to slightly umbonate, ostiole c. 2 mm diam.; internal hairs absent. *Tepals* dark red whitish, glabrous. *Styles* glabrous.

Distribution — Celebes.

Habitat — Forest, at altitudes up to 1200 m.

Note — This species is distinct by its glabrous and smooth plant parts and the presence of only one waxy gland per lamina, a feature it has in common with many species of sect. *Palaeomorphe*. In these features *F. cauta* does not match the other species of sect. *Sycidium* in which it was ranked by Corner (1960). Although it was not possible to establish whether the staminate flowers contain pistillodes or pistils, on the basis of the material available for the present version of the Flora Malesiana treatment, a transfer of *F. cauta* to sect. *Palaeomorphe* appears to be justified. The habit, the features of the leaf, and the dimensions of the figs, suggest a position near *F. tinctoria*. It can be distinguished from *F. tinctoria* and allied species (see p. 264) by the long basal lateral veins, 1/3–1/2 the length of the lamina, whereas up to 1/3 in the other four species.

46. **Ficus celebensis** Corner

Ficus celebensis Corner, Gard. Bull. Singapore 17 (1960) 478; 21 (1965) 76.

Ficus irregularis Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 224, 292, non Steud. 1840; King, Sp. Ficus 2 (1888) 92, t. 117; Koord., Minah. (1898) 603.

Tree up to 25 m tall, terrestrial. *Branchlets* drying brown. *Leafy twigs* 1.5–2 mm thick, glabrous, smooth; internodes solid. *Leaves* distichous; lamina linear to lanceolate, 4–14 by 0.5–3 cm, (almost) symmetric to ± asymmetric, coriaceous, apex acute to subacuminate, base (almost) equilateral, cuneate, margin entire or unilaterally or bilaterally (and obliquely) lobed, often ± revolute; both surfaces glabrous, smooth; cystoliths on both sides; midrib slightly prominent to flat above; veins 8–20 pairs, the basal pair (weakly developed and) running close to the margin, up to 1/20–1/10 the length of the lamina, unbranched, the other lateral veins departing the midrib at angles of (nearly) 90°, tertiary venation reticulate; waxy glands in the axils of one of the basal lateral veins; petiole 0.3–0.8 cm long, glabrous, the epidermis ± flaking off; stipules amplexicaul, (0.5–)1–2 cm long, glabrous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.1–0.4 cm long; peduncular bracts 3, at the base of the peduncle, c. 0.5 mm long; receptacle (sub)globose, 0.3–0.4 cm diam. when dry, glabrous, smooth, without lateral bracts, yellowish at maturity, apex umbonate, ostiole c. 1 mm diam., surrounded by a rim; internal hairs minute, sparse. *Tepals* whitish, ciliolate. *Styles* glabrous.

Distribution — Celebes (Minahassa).

Habitat — Unknown.

Note — The species is known by only few collections from natural habitats. It is in cultivation as ornamental tree in many tropical countries.

47. **Ficus cuspidata** Reinw. ex Blume

Ficus cuspidata Reinw. ex Blume, Bijdr. (1825) 464; Miq., London J. Bot. 7 (1848) 429; Pl. Jungh. (1851) 56; in Zoll., Syst. Verz. 2 (1854) 92; Fl. Ind. Bat. 1, 2 (1859) 308, t. 19; Fl. Ind. Bat., Suppl. (1861) 174; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292; King, Sp. Ficus 2 (1888) 88, t. 112; Fl. Brit. India 5 (1888) 520; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 179; Renner, Bot. Jahrb. Syst. 39 (1907) 396; Koord., Atlas Baumart. Java 4 (1918) t. 751; Merr., Enum. Born. (1921) 222; Ridl., Fl. Malay Penins. 3 (1924) 340; 5 (1925) 333. — *Ficus sinuata* Thunb. subsp. *cuspidata* (Reinw. ex Blume) Corner, Gard. Bull. Singapore 17 (1960) 479; 21 (1965) 77; Backer & Bakh.f., Fl. Java 2 (1965) 25; Kochummen, Tree Fl. Malaya 3 (1978) 156.

Ficus angustifolia Blume, Bijdr. (1825) 463. — *Ficus cuspidata* Reinw. ex Blume forma *angustifolia* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 308, t. 19.

Ficus cuspidata Desf., Cat. Hort. Paris, ed. 3 (1829) 413, non Reinw. ex Blume 1825.

Ficus tenuiramis Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 21; Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 252.

Shrub or tree up to 7 m tall, often hemi-epiphytic. *Branchlets* drying brown. *Leafy twigs* 1–2 mm thick, sparsely minutely puberulous, smooth; internodes solid. *Leaves* distichous; lamina oblong (to elliptic to subrhombic or to (ob)lanceolate), 3–8(–16) by 1–2.5(–4.5) cm, (almost) symmetric to slightly asymmetric, coriaceous to subcoriaceous, apex (gradually) caudate, 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 beneath; midrib prominent above; lateral veins 5–9(–15) pairs, the basal pair mostly somewhat different from the other lateral veins, running close to the margin, up to c. 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 ciliolate, caducous. *Figs* axillary, solitary or paired, or clustered on minute spurs, more commonly so on up to 0.3 cm long spurs (or tubercles) below the leaves (ramiflorous); peduncle 0.05–0.2 cm long; peduncular bracts 2 or 3, at the base of the peduncle, c. 0.5 mm long; receptacle ovoid to ellipsoid to (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 c. 1 mm diam., surrounded by short and ± thickened apical bracts; internal hairs absent. *Tepals* whitish, glabrous. *Styles* glabrous.

Distribution — Thailand (Peninsular); in *Malesia*: Sumatra, Malay Peninsula, Java.

Habitat — Forest, at altitudes between (1000–)1300 and 2000(–2100?) m.

Notes — 1. The collections from Java and some from Sumatra have ± clearly revolute lamina margins; those from Thailand and the Malay Peninsula, as well as some from Sumatra have flat lamina margins.

2. The type collection of *F. cuspidata* has some leaves with (ob)lanceolate laminas up to 16 cm long with up to 15 pairs of lateral veins. These features are not included in the description. See note under *F. gracillima* for a similar aberrant lamina.

3. Labels of three specimens indicate that they have been collected in Celebes, Borneo, and New Guinea, respectively. Because of doubt about provenance they are not included in the distribution paragraph.

4. The differences between this species and *F. heteropleura*, *F. kuchinensis*, and *F. parietalis* are indicated under the first species.

48. Ficus funiculicaulis C.C. Berg

Ficus funiculicaulis C.C. Berg, Blumea 48 (2003) 577.

Liana or hemi-epiphytic treelet up to 3 m tall. *Branchlets* drying brown to greyish, fig-bearing branchlets to blackish. *Leafy twigs* 1.5–2 mm thick, (very) sparsely puberulous to subhispidulous, (almost) smooth. *Leaves* distichous; lamina oblong to subobovate, 6–19 by 2–7 cm, somewhat asymmetric to almost symmetric, subcoriaceous to chartaceous, apex acuminate to subcaudate, base ± inequilateral to almost equilateral, if inequilateral, then one side cuneate (to subcordate), the other side slightly to clearly decurrent, auriculate or not, if equilateral, then subcordate, margin entire, flat; both surfaces glabrous, smooth; cystoliths on both sides; midrib prominent above; lateral veins 7–10(–11) pairs, the basal pair up to 1/10–1/4 the length of the lamina, unbranched, usually 1–3 pairs of smaller subbasal lateral veins, the other lateral veins also unbranched, tertiary venation laxly scalariform; waxy glands in the axils of the basal lateral vein; petiole 0.1–0.4 cm long, (very) sparsely whitish puberulous, epidermis flaking off; stipules amplexicaul, 0.2–1 cm long, sparsely and minutely whitish appressed-puberulous to glabrous, caducous. *Figs* flagelliflorous, on (clusters of) up to 1 cm long leafless branchlets with short internodes on up to c. 5 m long stolons; peduncle 0.2–0.5 cm long; peduncular bracts 1 or 2 (or 3), scattered, c. 0.5 mm long, ovate; receptacle (sub)globose to ovoid, 0.2–0.3 cm diam. when dry, glabrous, smooth, without lateral bracts, colour at maturity unknown, apex convex to slightly umbonate, ostiole 0.5–1 mm diam., surrounded by a very low irregular rim, the outer ostiolar slightly protruding; internal hairs absent. *Tepals* reddish (brownish when dry), glabrous. *Styles* glabrous.

Distribution — New Guinea (eastern).

Habitat — Rain forest, at low altitudes.

Notes — 1. This species can be distinguished from the other small-leaved species of sect. *Palaeomorphe* found in New Guinea, *F. armitii* and *F. gracillima*, by flagelliflory and the presence of cystoliths on both sides of the lamina.

2. According to the label data the figs are born on pendulous, rope-like, leafless, rooting branches extending as stolons in the litter. These branches depart from lianescent stems or stems of epiphytes attached to the stem of the host tree up to 1.5 m from the forest floor. From these branches occasional shoots with diminutive leaves develop.

49. **Ficus gracillima** Diels

Ficus gracillima Diels, Bot. Jahrb. Syst. 67 (1935) 194. — *Ficus subulata* Blume var. *gracillima* (Diels) Corner, Gard. Bull. Singapore 17 (1960) 478.
?*Ficus otariophylla* Diels, Bot. Jahrb. Syst. 67 (1935) 209.

Shrub or tree up to 12 m tall, lianescent and/or hemi-epiphytic. *Branchlets* drying brown to greyish. *Leafy twigs* 1–2 mm thick, sparsely whitish minutely appressed-puberulous to hispidulous to (sub)glabrous, smooth or scabridulous; internodes solid. *Leaves* distichous; lamina oblong to subovate (to lanceolate), 2–10(–15) by 0.5–3(–5) cm, somewhat asymmetric to (almost) symmetric, subcoriaceous to coriaceous, apex caudate to subcaudate to acuminate, base slightly to clearly inequilateral, cuneate to subattenuate, one side often slightly decurrent or sometimes distinctly auriculate, margin entire, flat; upper surface glabrous, lower surface glabrous or sparsely appressed-puberulous on the midrib, smooth; cystoliths only beneath; midrib slightly prominent (to flat) above; lateral veins (5–)6–9 pairs, the basal pair slightly or hardly different from the other lateral veins, up to 1/10–1/8 the length of the lamina, unbranched, tertiary venation (sub)reticulate; waxy glands in the axils of one of the basal lateral veins (or in the axils of the 2nd or 3rd pair of lateral veins); petiole 0.2–0.7 cm long, sparsely puberulous to subhispidulous to glabrous, the epidermis flaking off; stipules amplexicaul, 0.2–0.5(–0.7) cm long, glabrous (or whitish puberulous), caducous; terminal buds ± clearly divaricate. *Figs* axillary or just below the leaves, solitary or paired; peduncle 0.1–0.5 cm long; peduncular bracts 2 or 3, scattered, c. 0.5 mm long; receptacle (sub)globose (to ellipsoid), 0.3–0.5 cm diam. when dry, 0.5–0.7 cm diam. when fresh, glabrous or appressed-puberulous near the ostiole, smooth, without lateral bracts, yellow to orange to red at maturity, apex convex to ± umbonate, ostiole 0.5–1 mm diam., surrounded by a rim; internal hairs absent. *Tepals* whitish, glabrous, indurate. *Styles* glabrous.

Distribution — From Celebes to the Solomon Islands (Bougainville); in *Malesia*: Celebes (Central), Moluccas (Aru Islands: Kobroor), New Guinea.

Habitat — Lowland and montane forest, often on river banks, sometimes as climbers or creepers on rocks or cliffs at altitudes up to 2300 m.

Notes — 1. This species has been regarded as a variety of *F. subulata* (Corner 1960). It is certainly closely related, but the co-occurrence of these two species and the absence of clear intermediates justifies the reinstatement at the rank of species. In contrast to *F. subulata*, ramiflory is apparently absent in *F. gracillima*.

2. This species occurs at altitudes between 1500 and 2300 m, but is also frequently found at lower altitudes. At these lower altitudes the lamina tends to be larger and its apex often acuminate to subcaudate rather than pronouncedly caudate.

3. One of the collections (*Henty NGF 27061*, from Rossel Island) deviates in the venation: the lamina is 'willow-like' and the primary lateral veins are hardly distinct from the secondary ones, and both depart from the midrib in angles of nearly 90°.

50. **Ficus grewiifolia** Blume

Ficus grewiifolia Blume, Bijdr. (1825) 473; Miq., Fl. Ind. Bat. 1, 2 (1859) 306; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273, 292.

Ficus lobbii Miq., London J. Bot. 7 (1848) 233; Fl. Ind. Bat. 1, 2 (1859) 305.
Ficus brevipes Miq., Pl. Jungh. (1851) 58; Fl. Ind. Bat. 1, 2 (1859) 305. — *Ficus grewiifolia* Blume var. *brevipes* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273.
Ficus hypsophila Miq., Pl. Jungh. (1851) 60; Fl. Ind. Bat. 1, 2 (1859) 303. — *Ficus grewiifolia* Blume var. *hypsophila* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273.
Ficus hypsophila Miq. var. *angustata* Miq., Pl. Jungh. (1851) 60. — *Ficus obscura* Blume var. *angustata* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 481; 21 (1965) 78.
Ficus remblas Miq., Pl. Jungh. (1851) 60; Fl. Ind. Bat. 1, 2 (1859) 304; Fl. Ind. Bat., Suppl. (1861) 429. — *Ficus grewiifolia* Blume var. *remblas* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273.
Ficus tadjam Miq., Pl. Jungh. (1851) 62; Fl. Ind. Bat. 1, 2 (1859) 312, t. 20c. — *Ficus subulata* Blume var. *tadjam* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 275, 292.
Ficus saxatilis Miq. in Zoll., Syst. Verz. 2 (1854) 92, non Blume 1825.
Ficus microtus Miq., Fl. Ind. Bat. 1, 2 (1859) 305.
Ficus tondana Miq., Fl. Ind. Bat. 1, 2. (1859) 305. — *Ficus microtus* Miq. var. *tondana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273, 292. — Syntypes: *Forsten s.n.* (L), July 1840, and *Reinwardt s.n.* (L), Oct. 1821, Indonesia, Celebes, near Tondana; the former belongs to *F. grewiifolia* and the latter to *F. pisifera* Wall. ex Voigt; the former specimen is designated as lectotype here.
Ficus microtus Miq. var. *lanceolata* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273.
Ficus grewiifolia Blume var. *angusta* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273.
Ficus grewiifolia Blume var. *anonifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273.

Shrub or tree up to 15 m tall, mostly hemi-epiphytic. *Branchlets* drying (pale) brown. *Leafy twigs* 1.5–3 mm thick, sparsely brownish minutely puberulous to subhispidulous to subglabrous, smooth (or scabridulous); internodes solid or hollow. *Leaves* distichous; lamina oblong to subobovate to elliptic or to lanceolate, (2–)4–22 by (1.5–)3–9 cm, ± asymmetric, chartaceous, apex acuminate, base ± equilateral, the narrow side cuneate to obtuse, the broad side obtuse to subcordate, decurrent, margin irregularly crenate-dentate to subentire, sometimes ± revolute; upper surface hispidulous to puberulous to subglabrous, ± scabrous or smooth, lower surface sparsely puberulous to hispidulous on the veins, scabridulous to smooth; cystoliths on both sides; midrib prominent above; lateral veins (4–)6–9(–11) pairs, the basal pair up to (1/5–)1/4–1/3 the length of the lamina, at the broad side usually branched, at the narrow side running close to the margin and unbranched, the other lateral veins mostly branched or furcate, tertiary venation (sub)reticulate to laxly subscalariform; waxy glands in the axils of one of the basal lateral veins; petiole 0.1–0.6 cm long, sparsely puberulous, the epidermis persistent; stipules semi-amplexicaul, 0.3–0.7 cm long, sparsely puberulous or only ciliolate, caducous or subpersistent. *Figs* axillary or just below the leaves, solitary or in pairs, or ramiflorous to cauliflorous, on (clusters of) short-shoots up to 1.5 mm long; peduncle 0.1–0.5 cm long; peduncular bracts 2 or 3, scattered, often near the base, c. 0.5 mm long; receptacle (sub)globose, 0.3–0.5 cm diam. when dry, very sparsely puberulous to subhispidulous, smooth, without or with 1 or 2 lateral bracts, yellow to orange or reddish at maturity, apex convex, ostiole c. 1 mm diam., surrounded by low rim; internal hairs absent. *Tepals* whitish (or pinkish), minutely hairy at the apices. *Styles* glabrous.

Distribution — Sumatra, Java, Celebes, Moluccas (Sula Islands).

Habitat — Forest and secondary growth, at altitudes up to 1500 m.

51. **Ficus hemsleyana** King

Ficus hemsleyana King, Sp. Ficus 2 (1888) 112, t. 146; Koord., Atlas Baumart. Java 4 (1918) t. 770; Merr., Enum. Born. (1921) 224; Corner, Gard. Bull. Singapore 21 (1965) 79; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 281.

Shrub or tree up to 7 m tall, often hemi-epiphytic or lianescent. *Branchlets* drying brown to yellowish. *Leafy twigs* 2–3 mm thick, rather densely (to sparsely) (dark) brown hirtellous to puberulous (to hispidulous), smooth (to scabridulous); internodes solid. *Leaves* distichous; lamina lanceolate, 10–30(–37) by 3–8(–14) cm, (almost) symmetric (except for the base), subcoriaceous to chartaceous, apex (sub)caudate, acumen narrow, base inequilateral, one side decurrent down to near the base of the petiole and auricled, the auricle (partly) covering the petiole or also part of the leafy twig and often with flabellate venation, the other side rounded to subcordate, margin denticulate to entire, flat; upper surface hirtellous to puberulous at least on the lower or basal part of the midrib and the basal lateral veins, glabrescent, smooth, lower surface rather densely to sparsely puberulous to subhirtellous or to (sparsely) hispidulous on the main (and smaller) veins, smooth to scabridulous; cystoliths only beneath; midrib prominent above; lateral veins (5–)8–12 pairs, the basal pair mostly somewhat different from the other lateral veins, running close to the margin, up to 1/4–1/3(–1/2) the length of the lamina, unbranched, the other lateral veins (ascending) mostly unbranched, the lower ones not distinctly loop-connected, tertiary venation scalariform; waxy glands in the axil of one of the basal lateral veins and (usually) smaller ones in the axils of one or more other lateral veins; petiole 0.2–0.5 cm long, puberulous to hirtellous, the epidermis ± flaking off; stipules semi-amplexicaul, (0.5–)1–1.8 cm long, appressed-puberulous, ciliolate, or glabrous, striate, subpersistent (or caducous). *Figs* ramiflorous to cauliflorous, clustered on large up to 1 cm high tubercles, down to the base of the trunk; peduncle (0.5–)1.5–2(–3) cm long; peduncular bracts 2 or 3, at the base of the peduncle, c. 0.2 mm long; receptacle (sub)globose, 0.5–0.8 cm diam. when dry, sparsely hispidulous, scabridulous, without lateral bracts, yellow to red at maturity, apex convex, ostiole c. 1 mm diam., slightly sunken, surrounded by a (very) low rim; internal hairs sparse and minute. *Tepals* whitish or dark red, glabrous or minutely hairy at the apices. *Styles* glabrous.

Distribution — Borneo.

Habitat — Forest, at altitudes up to 1300 m.

Notes — 1. This species is quite distinct in the base of the lamina, at one side with a large auricle concealing the petiole. It resembles *F. rubromidotis*, with a less pronounced auricle at the base of the lamina. The two species can be easily distinguished by the stipules, semi-amplexicaul in *F. hemsleyana* and fully amplexicaul in *F. rubromidotis*. Moreover, they differ in the basal pair of lateral veins, short (up to 1/10 the length of the lamina) in *F. rubromidotis* and up to 1/4–1/3(–1/2) the length of the lamina in *F. hemsleyana*, as well as in the indumentum of leafy twigs and petioles which is more conspicuous in the latter than in the former.

2. *Ficus hemsleyana* can also be confused with *F. aurita* (var. *auriculifera*), but in the former the upper surface of the lamina is hairy, at least at the bases of the midrib and basal lateral veins, being entirely glabrous in the latter.

52. Ficus heteropleura Blume

Ficus heteropleura Blume, Bijdr. (1825) 466; Corner, Gard. Bull. Singapore 17 (1960) 480; 21 (1965) 77; Kochummen, Tree Fl. Malaya 3 (1978) 148; Tree Fl. Sabah & Sarawak 3 (2000) 243.

Ficus radicans Roxb., Fl. Ind., ed. Carey 3 (1832) 536, non Desf. 1829; Wight, Ic. 2 (1843) t. 671; Miq., London J. Bot. 7 (1848) 428; Pl. Jungh. (1851) 56; Fl. Ind. Bat. 1, 2 (1859) 306; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278, 293; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 252; Kurz, Forest Fl. Burma 2 (1877) 452.

Ficus acuminata Wall. ex Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 21, non Roxb. 1832.

Ficus euryaefolia Kunth & C.D. Bouché, [Ind. Sem. Hort. Berol. 1846 (1847) 21, nom. in synom.]; Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 252; Miq., London J. Bot. 7 (1848) 428; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293.

Ficus urophylla Wall. ex Miq., London J. Bot. 7 (1848) 429; Miq., Pl. Jungh. (1851) 56; Fl. Ind. Bat. 1, 2 (1859) 306; Fl. Ind. Bat., Suppl. (1861) 174, 429; Náves & Fern.-Vill., Nov. App. (1880) 201; Náves in Blanco, Fl. Filip., ed. 3 (1877–1883) t. 255; King, Sp. Ficus 1 (1887) 11, t. 9; Fl. Brit. India 5 (1888) 498; Renner, Bot. Jahrb. Syst. 39 (1907) 394; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 361; Gagnep., Fl. Indo-Chine 5 (1928) 799. — *Ficus rostrata* Lam. var. *urophylla* (Wall. ex Miq.) Valeton in Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 174; Koord. & Valeton, Atlas Baumart. Java 4 (1918) t. 752.

Ficus intermedia Griff., Ic. Pl. Asiat. 4 (1854) t. 556 (II).

Ficus radicans Roxb. forma *brevifolia* Miq., Fl. Ind. Bat. 1, 2 (1859) 306.

Ficus caudatifolia Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 194; Elmer, Leafl. Philipp. Bot. 1 (1907) 240; 2 (1908) 534; Merr., Philipp. J. Sci., Bot. 3 (1908) 402; Elmer, Leafl. Philipp. Bot. 4 (1911) 1241; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 206, f. 5; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 48; Elmer, Leafl. Philipp. Bot. 9 (1937) 3467; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 231.

Ficus mindanaensis Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 195; Elmer, Leafl. Philipp. Bot. 1 (1906) 188; 7 (1914) 2400; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 58; Elmer, Leafl. Philipp. Bot. 10 (1937) 3475; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 233. — *Ficus heteropleura* Blume var. *mindanaensis* (Warb.) Corner, Gard. Bull. Singapore 17 (1960) 480.

Ficus eucaudata Elmer, Leafl. Philipp. Bot. 1 (1906) 40. — *Ficus caudatifolia* Warb. var. *eucaudata* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 231.

Ficus caudatifolia Warb. var. *ovata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 231.

Ficus rostrata auct. non Lam.: Blanco, Fl. Filip. (1837) 679; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 173.

Shrub, tree up to 13 m tall, often (?) lianescent and/or 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 to oblong to lanceolate to subovate or to subobovate, (2.5–)5–25(–45) by (1–)2.5–10(–18) cm, (almost) symmetric to slightly asymmetric, (sub)coriaceous, often drying reddish, apex caudate to acuminate, base (almost) equilateral, cuneate to rounded (to cordulate), margin entire, often slightly revolute, at the base involute; 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 beneath; midrib impressed above; lateral veins (2–)3–8 pairs, the basal pair up to 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 furcate, tertiary venation (sub)reticulate to scalariform; waxy glands in the axils of one of the

basal lateral veins (or in large leaves in the axils of both); petiole (0.3–)0.7–1.5(–2) 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 (0.1–)0.5–1.5 cm long; peduncular bracts 2 or 3, mostly near the base, 0.5–1 mm long; receptacle (sub)globose, (0.3–)0.5–1.5 cm diam. when dry, 1–2.5 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 1–3 mm diam., sometimes surrounded by a lobed rim; internal hairs absent or short and sparse (to abundant). *Tepals* whitish, glabrous. *Styles* glabrous.

Distribution — From NE India, Bhutan, Myanmar, China (Hainan), Indochina, and Thailand to Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines, Celebes, Lesser Sunda Islands (Flores), Moluccas (Buru, Ceram, Ambon, Batjan).

Habitat — Forest or secondary growth, at altitudes up to 1500 m.

Notes — 1. Material referred to *F. heteropleura* var. *hirta* Corner (1960) deviated so much from the already wide range of variation that it had to be excluded and described as a distinct species, *F. kuchinensis*.

2. Within the species three rather distinct forms can be recognized:

a. *Leafy twigs* 1–2 mm thick, subhispidulous. *Lamina* elliptic to oblong, (2.5–)5–15(–23) by (1–)2.5–6(–8) cm, base cuneate, apex usually (sub)caudate; lower surface sparsely subhispidulous to subglabrous; lateral veins mostly (2–)3–5(–6) pairs, the basal pair up to 1/4–1/2 the length of the lamina, tertiary venation mostly (sub)reticulate; petiole 0.3–1(–2); stipules mostly amplexicaul, 0.2–0.8 mm long, glabrous. *Fig peduncle* (0.1–)0.5–1.5 cm long, receptacle 0.3–0.6(–0.8) cm diam. when dry, ostiole 1–1.5 mm diam. — The typical form. — Throughout the Malesian part of the species range, but in the Philippines only with intermediates with the next form.

b. *Leafy twigs* 1.5–3 mm thick, subhispidulous. *Lamina* oblong to elliptic to subovate, (5–)8–20(–24) by (1.5–)3–7(–8) cm, apex acuminate to subcaudate or caudate, base cuneate or often rounded to obtuse, but then the very base subattenuate; lower surface subglabrous; lateral veins (4–)5–8 pairs, the basal pair up to 1/8–1/4 the length of the lamina, tertiary venation (sub)scalariform (to subreticulate); petiole 0.5–1.5(–2) cm long, subhispidulous; stipules mostly semi-amplexicaul, 0.3–0.8 cm long, glabrous. *Fig peduncle* 0.8–1.5 cm long; receptacle 0.6–0.8(–1) cm diam. when dry, ostiole c. 2 mm diam. — An atypical form (comprising the type of *F. caudatifolia*) with several collections linking it to the typical form. The leaves resemble those of material from the Asian mainland. Moreover, it links the typical widespread form with the next form, which otherwise would have been outside the range of variation one could expect within a species. — Philippines (Luzon, Polillo, Samar, Panay, Negros); at low altitudes; rather similar material also in the Asian mainland. — Mostly shrubs or treelets, less commonly lianescent.

c. *Leafy twigs* 2–4 mm thick, ± densely brown puberulous to subhispidulous. *Lamina* elliptic to oblong to subovate, 10–25(–45) by 4–10(–18) cm, apex acuminate, base rounded to cordulate; lower surface puberulous to subhispidulous

on the veins, smooth to scabridulous; lateral veins 5–9 pairs, the basal pair up to 1/8–1/4, mostly running close to the margin and then unbranched, sometimes more distantly and then ± branched, tertiary venation (sub)scalariform; waxy glands sometimes in the axils of both lateral veins; petiole 0.5–1.5(–2) cm long, brown puberulous; stipules mostly semi-amplexicaul, 0.5–1 cm long, puberulous. *Fig peduncle* 0.4–1(–1.2) cm long; receptacle (0.8–)1–1.5 cm diam. when dry, sometimes with few lateral bracts, ostiole c. 3 mm diam., surrounded with a lobed rim. — A form recognized as var. *mindanaensis*. The differences with the other forms are such that a subspecific status has to be considered. — Confined to the Philippines (Luzon, Mindoro, Leyte, Samar, Cebu, Biliran, Mindanao); at low altitudes. — Mostly shrubs or trees (up to 8 m tall), less commonly lianescent.

3. *Ficus heteropleura* constitutes with *F. cuspidata*, *F. kuchinensis*, and *F. sinuata*, a group of ± closely related and partly sympatric species which can be very easily confused. *Ficus heteropleura* and *F. kuchinensis* can be rather easily distinguished from the other two species by the midrib of the lamina, being ± impressed above, although often less clearly in material of *F. heteropleura* from the Philippines. *Ficus parietalis*, which also has the midrib ± impressed above, can be told apart by the regular tertiary venation, largely (almost) perpendicular to the midrib and the more numerous intercostals.

53. Ficus inaequifolia Elmer

Ficus inaequifolia Elmer, Leafl. Philipp. Bot. 1 (1907) 242; 2 (1908) 535; 4 (1911) 1240; 7 (1914) 2411; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 66; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 229; Corner, Gard. Bull. Singapore 17 (1960) 477. — *Ficus subulata* Blume forma *inaequifolia* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 231.

Ficus caudatolongifolia Sata, J. Jap. Bot. 10 (1934) 550; Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 49, t. 42.

Shrub, tree or climber, terrestrial or hemi-epiphytic. *Branchlets* drying pale brown to yellowish. *Leafy twigs* 1.5–5(–6) mm thick, glabrous, smooth; internodes solid. *Leaves* distichous; lamina oblong elliptic, (4–)10–22(–30) by (1.5–)4–9(–12) cm, (almost) symmetric, coriaceous, apex abruptly acuminate, base slightly inequilateral, cuneate to obtuse, margin entire; both surfaces glabrous, smooth; cystoliths on both sides; midrib slightly prominent to flat above; lateral veins (6–)9–11(–14) pairs, the basal pair running close to the margin, up to 1/6–1/4 the length of the lamina, unbranched, other lateral veins unbranched, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins or only in one of them; petiole 0.8–1.8 cm long, glabrous, the epidermis flaking off; stipules amplexicaul, 1–2.8 cm long, glabrous or sparsely appressed-puberulous or only ciliolate, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.4–0.6 cm long; peduncular bracts 2 or 3, at the base of the peduncle, 0.5–1 mm long; receptacle (sub)globose, 0.4–0.6 cm diam. when dry, subglabrous or sparsely hispidulous, smooth or scabridulous, without lateral bracts, yellowish at maturity, apex convex or umbonate, ostiole c. 1 mm diam., surrounded by a low lobed rim; internal hairs minute, abundant. *Tepals* whitish, ciliolate. *Styles* glabrous.

Distribution — Philippines (Luzon, Mindoro, Negros, Mindanao).

Habitat — Forest and secondary growth, at low altitudes.

Note — This species has been included in *F. virgata* by Corner (Gard. Bull. Singapore 17 (1960) 477). However, the differences justify reinstatement of this species. Clear differences are the larger leaves with ± abruptly acuminate apices and the clearly scalariform tertiary venation. The habit of the two species may be different as well.

54. Ficus jaheriana Corner

Ficus jaheriana Corner, Gard. Bull. Singapore 18 (1961) 91; 21 (1965) 79.

Habit unknown. *Branchlets* drying brown. *Leafy twigs* 4–5 mm thick, white puberulous to subtomentose, smooth; internodes solid. *Leaves* distichous; lamina oblong to elliptic, 14–47 by 8–17 cm, ± asymmetric to almost symmetric, coriaceous, apex acuminate, base ± inequilateral, cordate, the lobes often concealing the petiole, margin sparsely and faintly dentate towards the apex to subentire, ± revolute; upper surface glabrous, smooth, lower surface sparsely hispidulous, scabridulous; cystoliths only beneath; midrib prominent above; lateral veins 5–10 pairs, the basal pair up to 1/5–1/4 the length of the lamina, branched, the other lateral veins furcate and loop-connected far from the margin, tertiary venation laxly (sub)scalariform to reticulate; waxy glands in the axil of one of the basal lateral veins; petiole 0.5–1.5 cm long, sparsely hispidulous, the epidermis persistent (?); stipule scars semi-amplexicaul; stipules not seen. *Figs* (ramiflorous); peduncle 0.4–0.7 cm long; peduncular bracts c. 0.5 mm long; receptacle (sub)globose, 0.5–0.8 cm diam. when dry, sparsely hispidulous, scabridulous, without lateral bracts, apex convex, ostiole 1–1.5 mm diam., surrounded by low rim; internal hairs absent. *Tepals* whitish (or pinkish), minutely hairy at the apices. *Styles* glabrous.

Distribution — Borneo (western).

Habitat — Unknown.

Note — This species is known only by the type collection, which is in a rather poor state and does not allow the preparation of a complete description.

55. Ficus kuchinensis C.C. Berg

Ficus kuchinensis C.C. Berg, Blumea 48 (2003) 579.
Ficus heteropleura Blume var. *hirta* Corner, Gard. Bull. Singapore 17 (1960) 480.

Treelet up to 5 m or climber. *Branchlets* drying dark brown to purplish. *Leafy twigs* 1.5–2.5 mm thick, densely brown puberulous to subhirtellous, smooth; internodes solid. *Leaves* distichous; lamina oblong (to elliptic), 7–20 by 2–6 cm, (almost) symmetric to ± asymmetric, (sub)coriaceous, apex caudate, base (almost) equilateral, rounded to obtuse, margin entire or on one or both sides irregularly coarsely dentate to sublobate, often ± revolute; upper surface glabrous, smooth, mostly shiny, lower surface ± densely puberulous to subtomentose on the veins, smooth; cystoliths only beneath; midrib impressed above; lateral veins 4–7 pairs, the basal pair running close to the margin of the lamina, up to 1/3–1/2 the length of the lamina, unbranched, the other lateral veins often branched or furcate, tertiary venation laxly (sub)scalariform to reticulate; waxy glands in the axils of one of the basal lateral veins; petiole 0.3–0.6 cm long, densely brown puberulous to subtomentose, epidermis persistent; stipules semi-amplexicaul, 0.4–0.8

cm long, brown puberulous to substrigillose, striate, subpersistent. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.1–0.2 cm long; peduncular bracts 2 or 3, scattered, most at the base, c. 0.5 mm long; receptacle (sub)globose, 0.3–0.5 cm diam. when dry, ± densely hispidulous, often scabridulous, without lateral bracts, pink to red at maturity, apex umbonate, ostiole c. 1 mm diam., sunken, surrounded by a rim; internal hairs absent. *Tepals* whitish to pinkish (pale brown when dry), glabrous. *Styles* glabrous.

Distribution — Borneo (Kalimantan, Sarawak, Sabah).

Habitat — Forest, at low altitudes.

Note — This species resembles *F. heteropleura* and has been described as var. *hirta* of that species (Corner 1960). However, the differences justify recognition of a distinct species. The important differences are: the persistent epidermis of the petiole, the subpersistent stipules, the small figs with a very short peduncle, and an umbonate apex with a sunken ostiole.

56. Ficus lasiocarpa Miq.

Ficus lasiocarpa Miq., Fl. Ind. Bat., Suppl. (1861) 429; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278; King, Sp. Ficus 1 (1887) 9, t. 7; Renner, Bot. Jahrb. Syst. 39 (1907) 394; Corner, Gard. Bull. Singapore 21 (1965) 77.
Ficus lasiophleba Miq., Fl. Ind. Bat., Suppl. (1861) 427.
Ficus parietalis Blume var. *hirsutissima* Merr., Pap. Michigan Acad. Sci. 19 (1934) 154.

Shrub or tree up to 6 m tall, or liana. *Branchlets* drying brown. *Leafy twigs* 2–5 mm thick, densely brownish tomentose, smooth; internodes solid. *Leaves* distichous; lamina oblong (to lanceolate), 9–33 by 3–12 cm, (almost) symmetric to slightly asymmetric, (sub)coriaceous, apex acuminate to caudate, base usually (almost) equilateral, (narrowly) subcordate to cuneate, margin entire or sparsely and coarsely dentate, often ± revolute; upper surface glabrous, but hairy at the base(s) of the midrib (and the basal lateral veins), smooth, lower surface densely (sub)tomentose on the veins, smooth; cystoliths only beneath; midrib ± impressed above; lateral veins 6–9 pairs, the basal pair up to 1/4–1/3(–1/2) the length of the lamina, if not running close to the margin of the lamina then branched, the other lateral veins often branched or furcate, tertiary venation laxly scalariform; waxy glands in the axils of one of the basal lateral veins; petiole 0.5–1.5 cm long, densely brownish tomentose, the epidermis persistent; stipules semi-amplexicaul, 1–1.5 cm long, brown subhirtellous, caducous or subpersistent. *Figs* axillary (or just below the leaves), solitary, in pairs, or clustered on short spurs; sessile or with a peduncle up to 1 cm long; peduncular bracts 1–3, scattered, mostly near the base, 0.5–1 mm long; receptacle (sub)globose, 0.6–1 cm diam. when dry, densely brownish (sub)tomentose, smooth, without lateral bracts, colour at maturity unknown, apex convex to ± umbonate, ostiole c. 2.5 mm diam., ± sunken, surrounded by a lobed rim; internal hairs absent. *Tepals* whitish, glabrous. *Styles* glabrous.

Distribution — Sumatra.

Habitat — Open forest or other open places like rock surfaces, at altitudes up to c. 800 m.

Note — The midrib is distinctly impressed in coriaceous laminas, but not in subcoriaceous ones on certain (rapidly growing?) shoots.

57. **Ficus leptocalama** Corner

Ficus leptocalama Corner, Gard. Bull. Singapore 17 (1960) 483; 21 (1965) 79; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 283.

Shrub or treelet up to 5 m tall, sometimes creeping or hemi-epiphytic. *Branchlets* drying pale brown. *Leafy twigs* 1–2 mm thick, glabrous, smooth; internodes solid. *Leaves* distichous; lamina oblong to lanceolate, 6–18 by 2.5–7.5 cm, slightly asymmetric to (almost) symmetric, subcoriaceous to chartaceous, apex caudate, base inequilateral, cuneate to (sub)attenuate, one side decurrent and sometimes subauriculate, margin (sub)entire, flat; both surfaces glabrous, smooth to scabridulous; cystoliths only beneath; midrib slightly prominent to slightly impressed above; lateral veins (6–)7–10 pairs, the basal pair mostly somewhat different from the other lateral veins, running close to the margin, up to 1/8–1/6 the length of the lamina, unbranched, the other lateral veins unbranched, tertiary venation laxly (sub)scalariform; waxy glands in the axils of one of the basal lateral veins and (faint) smaller ones (unilaterally) in the axils of other lateral veins; petiole 0.1–0.3 cm long, glabrous, the epidermis flaking

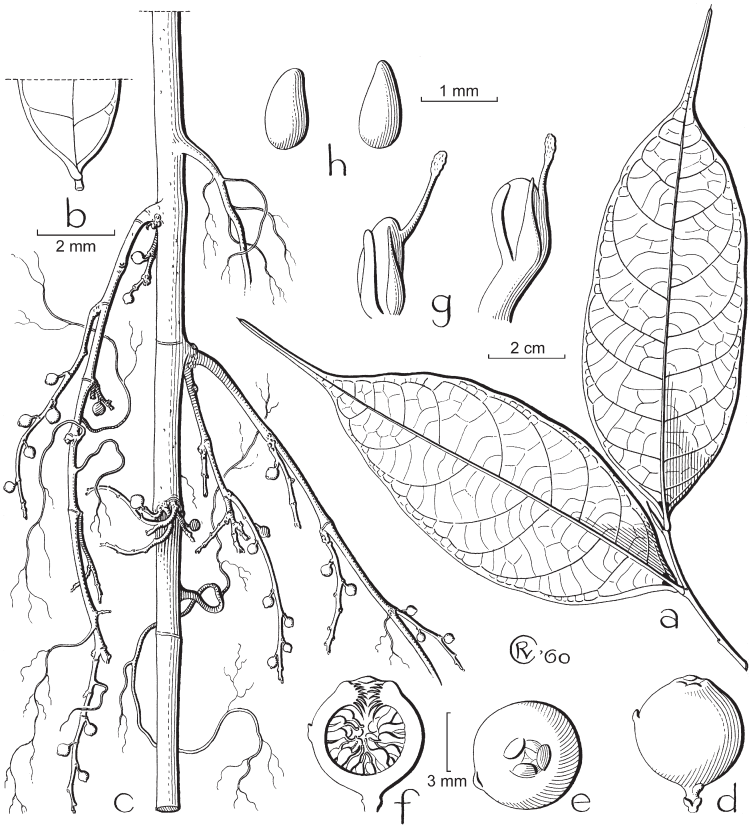


Fig. 52. *Ficus leptocalama* Corner. a. Leafy twig; b. base of lamina; c. rooting branch with fig-bearing branchlets; d–f. figs; g. long-styled flowers; h. fruits (all: *SF 26829*).

off; stipules amplexicaul, 0.4–0.8 cm long, minutely puberulous or glabrous, caducous. *Figs* axillary solitary, in pairs or clustered, sometimes (?) (flagelliflorous), on up to 0.5 cm long short-shoots on rooting, branched and up to 1.8 cm long leafless branchlets with long internodes; peduncle 0.1–0.2 cm long; peduncular bracts 2 or 3, scattered, c. 0.2 mm long; receptacle (sub)globose, 0.2–0.3 cm diam. when dry, sparsely minutely hispidulous, scabridulous, without lateral bracts, yellow to red at maturity, apex convex, ostiole c. 1 mm diam., sunken, surrounded by a (very) low rim; internal hairs absent. *Tepals* whitish, glabrous. *Styles* glabrous. — **Fig. 52.**

Distribution — Borneo (Sabah).

Habitat — Mostly rocky stream banks, at altitudes between c. 1000 and 1300 m.

Note — This species is described as being flagelliflorous (geocarpic). However, it is likely that the plants are only accidentally geocarpic by the lower branches getting in touch with or become imbedded in the (loose) substrate. The leafless and branched fig bearing branches (of the type collection) look quite different from those in truly flagelliflorous taxa.

58. Ficus microsphaera Warb.

Ficus microsphaera Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 199; Elmer, Leafl. Philipp. Bot. 4 (1911) 1240; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 57; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 286; Corner, Gard. Bull. Singapore 21 (1965) 78.

Treelet up to 4 m tall, often lianescent and/or hemi-epiphytic. *Branchlets* drying brown to greyish. *Leafy twigs* 1–2 mm thick, minutely whitish to brownish hispidulous, ± scabrous; internodes solid. *Leaves* distichous; lamina oblong to subobovate to lanceolate, 6–18(–33) by 1.5–5.5(–9.5) cm, slightly asymmetric, (sub)coriaceous to chartaceous, apex acuminate to caudate, base ± equilateral, obtuse to rounded, at one side decurrent, margin entire or faintly denticulate, upper surface glabrous, smooth, lower surface sparsely puberulous to subhispidulous, smooth to scabridulous; cystoliths only beneath; midrib prominent above; lateral veins 7–9 pairs, the basal pair running close to the margin of the lamina, up to 1/8–1/4 the length of the lamina, unbranched, tertiary venation laxly scalariform; waxy glands in the axils of one of the basal lateral veins or of both; petiole 0.1–0.5 cm long, minutely hispidulous, the epidermis persistent; stipules semi-amplexicaul, 0.3–0.6 cm long, minutely hispidulous, caducous. *Figs* axillary or just below the leaves, solitary, in pairs, or clustered on minute spurs; subsessile or with a peduncle up to 0.2 cm long; peduncular bracts 2 or 3, scattered, mostly near the base, c. 0.5 mm long; receptacle (sub)globose, 0.2–0.4 cm diam. when dry, sparsely minutely hispidulous, scabridulous, without lateral bracts, yellow to orange or red at maturity, apex convex, ostiole c. 1 mm diam.; internal hairs absent or sparse and minute. *Tepals* whitish, glabrous. *Styles* glabrous.

Distribution — Philippines (Panay, Mindoro, Mindanao, Bohol).

Habitat — Forest, at altitudes up to 1900 m.

59. Ficus midotis Corner

Ficus midotis Corner, Gard. Bull. Singapore 17 (1960) 482; 21 (1965) 79; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 289.

Shrub or tree up to 11 m tall, often hemi-epiphytic. *Branchlets* drying brownish. *Leafy twigs* 1–3(–5) mm thick, hispidulous, scabridulous; internodes solid. *Leaves* distichous; lamina oblong to subobovate to elliptic (to lanceolate), 10–25(–34) by 4–8(–15) cm, (almost) symmetric, coriaceous to subcoriaceous, apex acuminate to caudate, base distinctly inequilateral to almost equilateral, cuneate to obtuse, one side often decurrent and often ± distinctly auriculate, crenate-dentate to entire, flat; upper surface glabrous, smooth, lower surface ± sparsely hispidulous, scabridulous to almost smooth; cystoliths only beneath; midrib and basal lateral veins (or also other lateral veins) ± impressed above; lateral veins (6–)8–13 pairs, the basal pair mostly somewhat different from the other lateral veins, running close to the margin, up to c. 1/8 the length of the lamina, unbranched, the other lateral veins sometimes furcate or branched, tertiary venation laxly (sub)scalariform; waxy glands in the axil of one of the basal lateral veins or (especially in large leaves) usually also (unilaterally or bilaterally) smaller ones in axils of one or some other lateral veins; petiole 0.3–1(–2) cm long, sparsely hispidulous, the epidermis flaking off; stipules semi-amplexicaul, 0.3–0.8(–1.2) cm long, glabrous, caducous. *Figs* axillary, solitary or paired, or clustered on minute spurs, or ramiflorous to cauliflorous, clustered on up to 0.5 cm long spurs or tubercles; peduncle 0.3–1(–2.5) cm long; peduncular bracts 2 or 3, at the base of the peduncle, rarely one in the middle, c. 0.5 mm long; receptacle (sub)globose (to ellipsoid), 0.3–0.8(–1) cm diam. when dry, 1–1.2 cm diam. when fresh, (very) sparsely hispidulous (to glabrous), ± scabrous (or smooth), without lateral bracts, yellow to red at maturity, apex convex, ostiole c. 1 mm diam., surrounded by faint rim; internal hairs absent or few and minute. *Tepals* whitish, glabrous or minutely hairy at the apices. *Styles* glabrous.

Distribution — Borneo.

Habitat — Forest, at altitudes up to 2800 m.

Notes — 1. The peduncles of figs in the leaf axils or on lesser branches are usually up to 1 cm long, but longer if the figs are cauliflorous.

2. The species shows a remarkable variation with regard to the length of the petiole and the base of the lamina, being distinctly decurrent and/or auriculate or hardly or not so. A number of collections from Mt Kinabalu has very short petioles and the relatively small leaves do not have additional waxy glands.

60. Ficus obscura Blume

Ficus obscura Blume, Bijdr. (1825) 474; Miq., Pl. Jungh. (1851) 59; Fl. Ind. Bat. 1, 2 (1859) 302 (? incl. var. *serrata* Miq. of which no specimen found); Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272, 292; Renner, Bot. Jahrb. Syst. 39 (1907) 395; Merr., Enum. Born. (1921) 225; Corner, Gard. Bull. Singapore 17 (1960) 480; Backer & Bakh.f., Fl. Java 2 (1965) 27; Corner, Gard. Bull. Singapore 21 (1965) 78; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 292. — *Ficus pisifera* Wall. ex Voigt var. *scaberrima* (Blume) Valeton forma *obscura* (Blume) Valeton in Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 49, 155.

Covellia dasycaula Miq., London J. Bot. 7 (1848) 460; Fl. Ind. Bat. 1, 2 (1859) 322. — *Ficus dasycaula* (Miq.) Valeton in Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 51, nomen in syn.

Ficus obsura Blume var. *lanata* Kochummen, Gard. Bull. Singapore 50 (1998) 215.

Shrub or tree up to 8 m tall, mostly hemi-epiphytic. *Branchlets* drying (pale) brown. *Leafy twigs* 2–5 mm thick, brown puberulous to subhirtellous, smooth; internodes solid or hollow. *Leaves* distichous; lamina oblong to elliptic to subobovate to lanceolate,

(3–)10–30(–40) by (2–)4–10(–13) cm, asymmetric, chartaceous, apex acuminate to subcaudate, base ± equilateral, the narrow side cuneate to subcordate, the broad side rounded to cordate (or to cuneate), decurrent and often subauriculate, margin entire or denticulate to coarsely dentate (to sublobate), often ± revolute; upper surface puberulous to subhispidulous, mainly on the veins, ± scabrous to smooth, lower surface (rather) densely brown puberulous to subtomentose on the veins, smooth; cystoliths on both sides; midrib prominent above; lateral veins (4–)6–10(–12) pairs, the basal pair up to 1/8–1/4 the length of the lamina, at the broad side of the lamina usually branched, at the narrow side mostly running close to the margin of the lamina and unbranched, the other lateral veins mostly branched or furcate, tertiary venation laxly (sub)scalariform to reticulate; waxy glands in the axils of one of the basal lateral veins or also 1 or 2 additional ones in the axils of other lateral veins at the same side of the lamina; petiole 0.2–1(–1.2) cm long, brown puberulous to subtomentose, the epidermis persistent; stipules semi-amplexicaul, 1–1.5 cm long, brownish appressed-puberulous to strigillose, subpersistent. *Figs* axillary or just below the leaves, solitary, in pairs or clustered on minute short-shoots, or also ramiflorous; with a peduncle 0.1–0.8(–1.2) cm long or subsessile; peduncular bracts 2 or 3, scattered, mostly near the base, c. 0.5 mm long; receptacle (sub)globose, 0.6–1 (or 0.3–0.5) cm diam. when dry, 1.5–2.2 cm diam. when fresh, densely brownish subhirtellous to subhispid to hispidulous (or sparsely whitish hispidulous), ± scabrous to almost smooth, without or with some lateral bracts, white to pink, yellow, orange, or to dark red at maturity, apex convex to slightly umbonate, ostiole c. 2 mm diam., surrounded by a rim; internal hairs absent or sparse and minute. *Tepals* whitish (or pinkish), minutely hairy at the apices. *Styles* glabrous.

Distribution — Sumatra, Java, Borneo, Philippines (Mindanao).

Habitat — Forest, at altitudes up to 1500 m.

Notes — 1. *Ficus obscura* was rather unsatisfactory defined as a species by Corner, as the varieties which were recognized co-occur without showing intermediates. In the present treatment it is segregated into three species: *F. grewiifolia*, *F. obscura*, and *F. pisifera*. They are evidently closely related, but show consistent differences. *Ficus grewiifolia* is characterized by sparse indumentum on the various parts, the smooth lamina, and the absence of additional waxy glands in the axils of other lateral veins than the basal ones. In the other two species, 1–3 waxy glands in the addition to the one in the axils of one of the basal lateral veins are common and the lamina is ± scabrous, at least above. *Ficus obscura* is distinct by the relatively large fig receptacles (0.6–1 cm diam. when dry), stipules of 1–1.5 cm long, and conspicuous indumentum on the various parts, in particular on the leafy twigs and the figs.

2. Some collections from E Kalimantan (*Kessler et al. PK 2343* and *Leighton 788*) match this species in their vegetative parts, but the figs are distinct as they are small (0.3–0.5 cm diam. when dry) and sparsely hispidulous to subglabrous, resembling those of *F. pisifera*.

3. The figs are eaten by Orang Utan.

61. **Ficus parietalis** Blume

Ficus parietalis Blume, Bijdr. (1825) 462; Miq., Fl. Ind. Bat. 1, 2 (1859) 307; Fl. Ind. Bat., Suppl. (1861) 430; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 277, 293; King, Sp. Ficus 1 (1887) 10, t. 8; Fl.

Brit. India 5 (1888) 498; Becc., For. Borneo (1902) 262; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 176; Renner, Bot. Jahrb. Syst. 39 (1907) 394; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 361; Koord., Atlas Baumart. Java 4 (1918) t. 753; Merr., Enum. Born. (1921) 225; Ridl., Fl. Malay Penins. 3 (1924) 330; Gagnep., Fl. Indo-Chine 5 (1928) 801; Quisumb., Philipp. J. Sci. 41 (1930) 317; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1012; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 234; Backer & Bakh.f., Fl. Java 2 (1965) 25; Corner, Gard. Bull. Singapore 21 (1965) 77; Kochummen, Tree Fl. Malaya 3 (1978) 153.

Ficus parietalis Blume var. *ovalis* Blume, Bijdr. (1825) 462.

Ficus cerasiformis Desf., Cat. Hort. Paris, ed. 3 (1829) 413; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 253; Miq., London J. Bot. 7 (1848) 428; Pl. Jungh. (1851) 293; Lem., Ill. Hort. 5 (1858) t. 167; Miq., Fl. Ind. Bat. 1, 2 (1859) 307; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293.

Ficus grandifolia Wall. ex Miq., London J. Bot. 7 (1848) 432, non Kunth & C.D. Bouché 1847; Miq., Fl. Ind. Bat. 1, 2 (1859) 309; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293.

Ficus junghuhniana Miq., Pl. Jungh. (1851) 56.

Ficus rufipila Miq., Pl. Jungh. (1851) 57. — *Ficus parietalis* Blume var. *rufipila* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278.

Ficus phlebophylla Miq., Fl. Ind. Bat., Suppl. (1861) 430; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293.

Ficus tabing Miq., Fl. Ind. Bat., Suppl. (1861) 430; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293. — *Ficus parietalis* Blume var. *tabing* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278.

Ficus concentrica Hassk. ex Miq., Choix Pl. Buitenzorg (1864) t. 11.

Ficus parietalis Blume var. *angustifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278.

Shrub, tree up to 10(–20?) m tall, often lianescent and/or hemi-epiphytic. *Branchlets* drying brown. *Leafy twigs* 2–3(–4) mm thick, ± densely brown puberulous to subtomentose to subhispidulous, smooth or scabridulous; internodes solid. *Leaves* distichous; lamina oblong to elliptic or to lanceolate to subobovate or to subovate, 8–25(–36) by 4–12(–14) cm, (almost) symmetric to ± asymmetric, (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 ± densely puberulous to subtomentose to sparsely (sub)hispidulous on the veins, smooth to scabridulous; cystoliths only beneath; midrib impressed above; lateral veins 3–6 pairs, the basal pair up to 1/2–3/4 the length of the lamina, if not running close to the margin of the lamina then ± branched, the other lateral veins often branched or furcate, tertiary venation scalariform, the greater part of the tertiary venation ± 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 or 3, scattered, mostly near the base, 0.5–1 mm long; receptacle (sub)globose (or ovoid to subpyriform), 0.8–1.5 cm diam. when dry, 1.5–2.5 cm diam. when fresh, ± densely brownish puberulous to subhispidulous, often scabridulous, without lateral bracts, yellow to orange to red or reddish brown at maturity, apex convex to slightly umbonate, ostiole c. 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.

Distribution — From Vietnam and Thailand to Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines (Palawan, Balabac), Moluccas (Ceram).

Habitat — Forest or secondary growth, at altitudes up to 1300(–2000) m.

Note — A collection at L with New Guinea indicated as provenance. New Guinea is not included in the distribution paragraph because of doubt about its origin.

62. **Ficus pisifera** Wall. ex Voigt

Ficus pisifera Wall. ex Voigt, Hort. Suburb. Calc. (1845) 285; Miq., London J. Bot. 7 (1848) 427; Fl. Ind. Bat. 1, 2 (1859) 301; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; King, Sp. Ficus 1 (1887) 3, t. 1; Fl. Brit. India 5 (1888) 496; Koord., Minah. (1898) 605; Boerl., Bull. Inst. Bot. Buitenzorg 5 (1900) 28; Becc., For. Borneo (1902) 262; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 151; Renner, Bot. Jahrb. Syst. 39 (1907) 393; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 361; Koord., Atlas Baumart. Java 4 (1918) t. 750; Merr., Enum. Born. (1921) 226; Enum. Philipp. Flow. Pl. 2 (1923) 61; Ridl., Fl. Malay Penins. 3 (1924) 329; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1012; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 235. — *Ficus scaberrima* Blume var. *pisifera* (Wall. ex Voigt) Hochr., Candollea 2 (1925) 327.

Ficus scaberrima Blume, Bijdr. (1825) 474; Miq., Pl. Jungh. (1851) 59; Fl. Ind. Bat. 1, 2 (1859) 304; Hochr., Candollea 2 (1925) 327. — *Ficus pisifera* Wall. ex Voigt var. *scaberrima* (Blume) Valeton in Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 155. — *Ficus obscura* Blume var. *scaberrima* (Blume) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273; Corner, Gard. Bull. Singapore 17 (1960) 482; 21 (1965) 79.

Ficus acuminatissima Miq., London J. Bot. 7 (1848) 233; Fl. Ind. Bat. 1, 2 (1859) 303; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292; Náves & Fern.-Vill., Nov. App. (1880) 200; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 253.

Ficus lancifolia Miq., London J. Bot. 7 (1848) 452; Fl. Ind. Bat. 1, 2 (1859) 304; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292; Náves & Fern.-Vill., Nov. App. (1880) 200; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 253. — *Ficus lancea* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 315.

Ficus leucoxylon Miq., Pl. Jungh. (1851) 6; Fl. Ind. Bat. 1, 2 (1859) 304. — *Ficus obscura* Blume var. *leucoxylon* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bot. 3 (1867) 273.

Ficus scaberrima Blume var. *angustata* Miq., Fl. Ind. Bat. 1, 2 (1859) 304.

Ficus tondana Miq., Fl. Ind. Bat. 1, 2 (1859) 305. — *Ficus microtus* Miq. var. *tondana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273, 292.

?*Covellia subdenticulata* Miq., Fl. Ind. Bat. 1, 2 (1859) 323. — ?*Ficus subdenticulata* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; King, Sp. Ficus 2 (1888) 82.

Ficus microtus Miq., Fl. Ind. Bat., Suppl. (1861) 428; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273, 292. — *Ficus pisifera* Wall. ex Voigt var. *microtus* (Miq.) Kuntze, Rev. Gen. Pl. 1 (1891) 627.

Ficus microtus Miq. var. *borneensis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273. — *Ficus obscura* Blume var. *borneensis* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 481; 21 (1965) 78.

Ficus microtus Miq. var. *parvifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 273.

Ficus celebica Blume var. *kunstleri* King, Sp. Ficus 1 (1887) 12, t. 10A; Fl. Brit. India 5 (1888) 499; Ridl., Fl. Malay Penins. 3 (1924) 330. — *Ficus obscura* Blume var. *kunstleri* (King) Corner, Gard. Bull. Singapore 17 (1960) 481.

Ficus flavocortica Elmer, Leafl. Philipp. Bot. 4 (1911) 1241; 7 (1914) 2399; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 52; Elmer, Leafl. Philipp. Bot. 9 (1937) 3484; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 236.

Ficus viridifolia Merr., Philipp. J. Sci., Bot. 8 (1913) 366; Enum. Philipp. Flow. Pl. 2 (1923) 68; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 236.

Ficus microsyce Ridl., Kew Bull. (1926) 82, non Ridl. 1924.

Ficus celebica Blume var. *lanceolata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 237.

Ficus celebica Blume var. *ovata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 237.

Ficus celebica auct. non Blume: Elmer, Leafl. Philipp. Bot. 1 (1906) 44; 4 (1911) 1239.
Ficus pisifera auct. non Wall. ex Voigt: Elmer, Leafl. Philipp. Bot. 1 (1906) 187; 1 (1907) 239; 2 (1908) 534.

Shrub or tree up to 10 m tall, mostly hemi-epiphytic. *Branchlets* drying (pale) brown. *Leafy twigs* 2–5 mm thick, brown puberulous to hispidulous, to subhirtellous or to subtomentose, smooth to scabrous; internodes hollow or solid. *Leaves* distichous; lamina oblong to subobovate to elliptic to obovate or to lanceolate, 3–20(–40) by 1.5–8(–13) cm, asymmetric, 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 up to (1/5–)1/4–1/3(–1/2) the length of the lamina, at the broad side of the lamina usually branched, at the narrow side mostly running close to the margin of the lamina and unbranched, the other lateral veins mostly branched or furcate, tertiary venation laxly (sub)scalariform to reticulate; waxy glands in the axils of one of the basal lateral veins and at the same side of the lamina mostly 1–5 additional ones in the axils of other lateral veins; 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, subpersistent 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 up to 0.5 cm long; with a peduncle 0.1–0.5(–1) cm long or subsessile; peduncular bracts 2 or 3, scattered, often near the base, c. 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 or 2 lateral bracts, yellow to orange or scarlet to purplish at maturity, apex convex to slightly umbonate, ostiole c. 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.

Distribution — Thailand (lower) and Malesia; in *Malesia*: Sumatra (incl. Banka, Simaloer Island, Lingga Arch., Mentawai Islands), Malay Peninsula, Java, Borneo, Philippines (Luzon, Mindoro, Negros, Samar, Cebu, Panay, Palawan), Celebes (Sangi Islands), Moluccas (Talaud Islands).

Habitat — Forest and secondary growth, at altitudes up to 2000 m.

Notes — 1. This species is rather variable in the indumentum and the dimensions of the leaves. Corner referred the small-leaved material from the Philippines and Borneo to var. *kunstleri*. The figs of this form have very short peduncles and the lamina is often subtomentose beneath. These features are also common in material with relatively small leaves (referred to var. *scaberrima* by Corner) and found mainly in Java and Sumatra.

2. The fig peduncle is mostly up to 0.4 cm long, sometimes (in Sumatra) up to 1 cm long, and the receptacle is mostly up to 0.5 cm diam. when dry, rarely larger.

3. The figs are eaten by Oran Utan.

63. **Ficus rubrocuspidata** Corner

Ficus rubrocuspidata Corner, Gard. Bull. Singapore 17 (1960) 483; 21 (1965) 79; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 299.

Shrub or tree up to 10 m tall, often lianescent and/or hemi-epiphytic. *Branchlets* drying pale brown to greyish. *Leafy twigs* 1–2 mm thick, very sparsely minutely puberulous to glabrous, smooth; internodes solid. *Leaves* distichous; lamina oblong lanceolate, 3–15(–23) by 1.5–4.5 cm, (almost) symmetric, subcoriaceous to coriaceous, apex caudate, base almost equilateral, cuneate (to obtuse), margin entire, flat; both surfaces glabrous, smooth; cystoliths only beneath; midrib prominent above; lateral veins 6–11(–14) pairs, the basal pair inconspicuous, hardly different from the other lateral veins, running close to the margin, up to c. 1/10 the length of the lamina, unbranched, the (other) lateral veins departing from the midrib with wide angles, up to 90°, ± curved to straight, sometimes furcate, tertiary venation (sub)reticulate; one waxy gland in the axil of one of the basal lateral veins; petiole 0.2–0.6 cm long, glabrous, the epidermis flaking off; stipules amplexicaul, 0.4–0.8 cm long, glabrous, caducous. *Figs* axillary, solitary or paired, or ramiflorous, clustered on minute spurs; with a peduncle up to 0.15 cm long or (sub)sessile; peduncular bracts 2 or 3, ± scattered, c. 0.2 mm long; receptacle

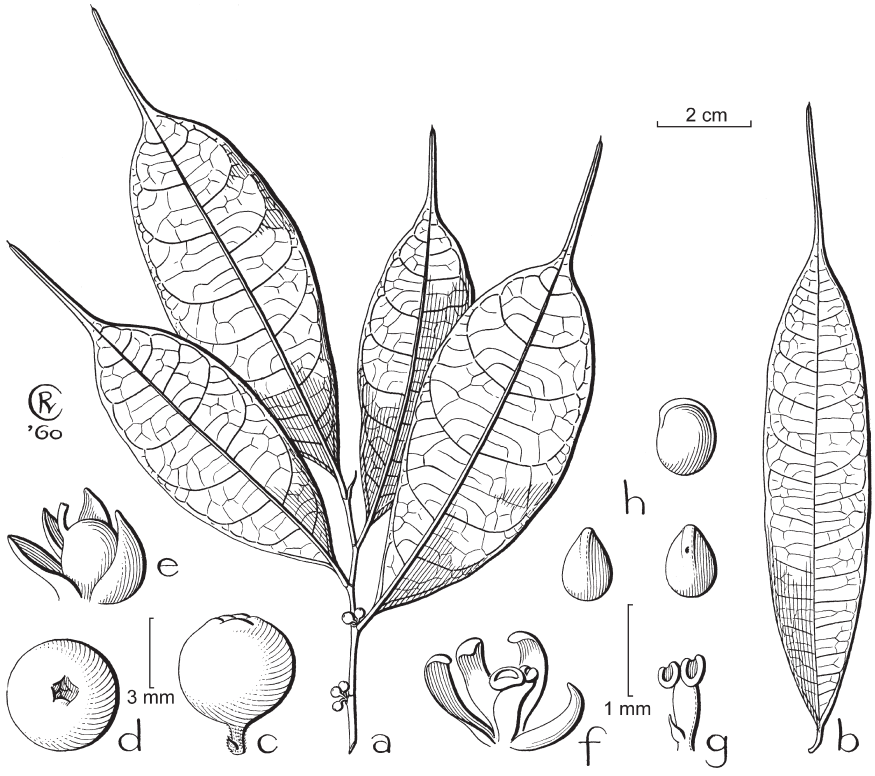


Fig. 53. *Ficus rubrocuspidata* Corner. a. Leafy twig with figs; b. leaf; c, d. figs; e. short-styled flower; f. staminate flower; g. stamen and pistillode; h. fruits (a: *Purseglove 5470*; b: *Purseglove 4671*; c–g: *SF 27323*; h: *Clemens 30824*).

(sub)globose, 0.2–0.3 cm diam. when dry, glabrous, smooth, without lateral bracts, orange to red or pink at maturity, apex convex, ostiole c. 1 mm diam., surrounded by a low and lobed rim; internal hairs absent. *Tepals* reddish to whitish, glabrous. *Styles* glabrous. — **Fig. 53.**

Distribution — Borneo.

Habitat & Ecology — Forest, at altitudes up to 1500 m; often low-level epiphytes, sometimes a creeper on rocks.

Note — This species resembles the allopathic *F. microsphaera*, from which it can be distinguished by the exfoliation of the epidermis of the petiole, the (sub)reticulate tertiary venation, and the smooth leafy twigs.

64. Ficus rubromidotis Corner

Ficus rubromidotis Corner, Gard. Bull. Singapore 17 (1960) 484; 21 (1965) 79; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 300.

Shrub or treelet up to 5 m tall, often hemi-epiphytic. *Branchlets* drying pale brown to greyish. *Leafy twigs* 2–4 mm thick, brownish hispidulous to subglabrous, ± scabrous to smooth; internodes solid. *Leaves* distichous; lamina oblong to lanceolate, (12–)20–36 by 5–12 cm, (almost) symmetric, subcoriaceous to coriaceous, apex acuminate to caudate, base inequilateral, one side cuneate to obtuse, and often subauricate, the other side decurrent to near the base of the petiole and distinctly auriculate with the lobe (partly) covering the petiole, margin entire, flat; upper surface glabrous, smooth, lower surface very sparsely hispidulous to (sub)glabrous, ± scabrous; cystoliths only beneath; midrib prominent above; lateral veins 10–20 pairs, the basal pair hardly or slightly different from the other lateral veins, running close to the margin, up to c. 1/10 the length of the lamina, unbranched, tertiary venation scalariform; waxy glands in the axils of one of the basal lateral veins and smaller ones in the axils of several other lateral veins; petiole 0.2–1 cm long, glabrous, the epidermis flaking off; stipules amplexicaul, (0.5–)1–2 cm long, minutely puberulous or glabrous, striate, aristate, subpersistent. *Figs* axillary, solitary, paired, mostly ramiflorous, clustered on spurs or tubercles; with a peduncle of 0.1–0.5 cm long or (sub)sessile; peduncular bracts 2 or 3, at the base of the peduncle, 0.2–0.5 mm

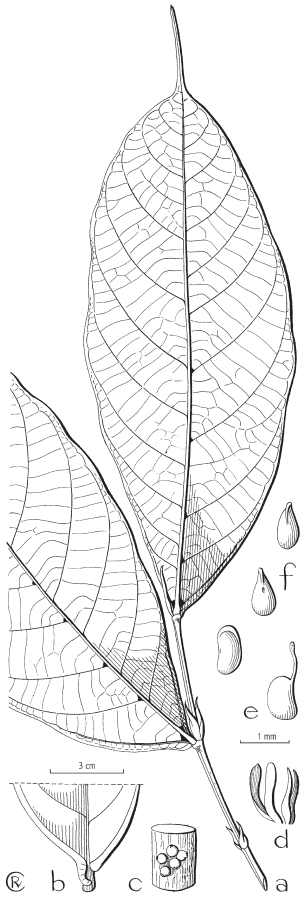


Fig. 54. *Ficus rubromidotis* Corner. a. Leafy twigs; b. base of lamina; c. figs; d, e. long-styled flower, perianth and pistil; f. fruits (a–c: *Brunei 5340*; d–f: *Brook 9125*).

long; receptacle (sub)globose, 0.3–0.5 cm diam. when dry, hispidulous, scabridulous, without lateral bracts, orange to red or pink at maturity, apex convex, ostiole c. 1 mm diam., surrounded by a low and lobed rim; internal hairs absent. *Tepals* reddish, glabrous. *Styles* glabrous. — **Fig. 54.**

Distribution — Borneo (northern: Sarawak, Brunei).

Habitat — Forest (or secondary growth), often along rivers and among (limestone) boulders; at low altitudes; apparently usually terrestrial.

65. *Ficus sinuata* Thunb.

Ficus sinuata Thunb., Diss. Fic. (1786) 6, 12; Corner, Gard. Bull. Singapore 17 (1960) 479; 21 (1965) 76; Backer & Bakh.f., Fl. Java 2 (1965) 26; Kochummen, Tree Fl. Malaya 3 (1978) 156; Tree Fl. Sabah & Sarawak 3 (2000) 305.

Ficus rostrata Lam., Encycl. 2, 2 (1788) 498; Vahl, Enum. Pl. 2 (1805) 200; Blume, Bijdr. (1825) 465; Miq., London J. Bot. 7 (1848) 429; Pl. Jungh. (1851) 56; Fl. Ind. Bat. 1, 2 (1859) 307; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 274, 293; King, Sp. Ficus 2 (1888) 86, t. 110; Fl. Brit. India 5 (1888) 520; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 171; Renner, Bot. Jahrb. Syst. 39 (1907) 396; Koord., Atlas Baumart. Java 4 (1918) t. 752A–H; Merr., Enum. Born. (1921) 227; Ridl., Fl. Malay Penins. 3 (1924) 340; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1014.

Ficus quercifolia Blume, Bijdr. (1825) 468.

Ficus raridens Miq., London J. Bot. 7 (1848) 430; Fl. Ind. Bat. 1, 2 (1859) 309; Fl. Ind. Bat., Suppl. (1861) 174.

Ficus obtusidens Miq., Pl. Jungh. (1851) 59; Fl. Ind. Bat. 1, 2 (1859) 305; Fl. Ind. Bat., Suppl. (1861) 174, 429.

Ficus radicans Roxb. var. *angulosa* Miq., Fl. Ind. Bat. 1, 2 (1859) 306.

Ficus angulidens Miq., Fl. Ind. Bat. 1, 2 (1859) 310; Fl. Ind. Bat., Suppl. (1861) 174.

Ficus cuspidata Reinw. ex Blume var. *sinuata* King, Sp. Ficus 2 (1888) 89, t. 112C; Fl. Brit. India 5 (1888) 520.

Ficus sinuata Thunb. var. *oblonga* Corner, Gard. Bull. Singapore 17 (1960) 479; Kochummen, Tree Fl. Malaya 3 (1978) 156.

Shrub or treelet up to 6 m tall with drooping branches, often hemi-epiphytic. *Branchlets* drying brown to yellowish. *Leafy twigs* 1–3 mm thick, glabrous or sparsely minutely hispidulous (glabrescent), ± angulate, smooth or scabridulous; internodes solid. *Leaves* distichous; lamina oblong to elliptic to subobovate or lanceolate, 4–15(–26) by 1.5–8(–10) cm, somewhat asymmetric to almost symmetric, coriaceous to subcoriaceous, apex ± abruptly acuminate to subcaudate, 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), in the lower part broadly lobate, or entire, flat; upper surface glabrous, smooth, lower surface very sparsely hispidulous on the veins to subglabrous, scabridulous to smooth; cystoliths only beneath; midrib prominent above; lateral veins 6–10 pairs or, if the lamina narrow then up to 17 pairs, the basal pair mostly somewhat different from the other lateral veins, running close to the margin, up to 1/8–1/4 the length of the lamina, unbranched, the other lateral veins departing at angles varying from c. 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(–2 or –3.5) cm long, sparsely minutely hispidulous, the epidermis persistent, sometimes flaking off; stipules am-

plexicaul, 0.3–0.8(–1) cm long, glabrous, caducous. *Figs* axillary, solitary or paired, or clustered on spurs, more commonly so on up to 1 cm long spurs below the leaves (ramiflorous); peduncle 0.1–0.4 cm long; peduncular bracts 2 or 3, scattered, 2 (sub)opposite, or 3 in whorl, 0.5–1 mm long; receptacle (sub)globose to ellipsoid, 0.3–0.8 cm diam. when dry, sparsely hispidulous, ± scabrous, often with few lateral bracts, orange to red at maturity, apex convex to slightly umbonate, ostiole c. 1 mm diam., often surrounded by a low (lobed) rim; internal hairs absent. *Tepals* whitish, glabrous. *Styles* glabrous.

Distribution — From NE India to Thailand and Malesia; in *Malesia*: Sumatra (incl. Riouw Arch.), Malay Peninsula, Java, Borneo.

Habitat & Ecology — Forest, at altitudes up to 1400(–1700) m, at Mt Singgalang (W Sumatra) at altitudes between 2000 and 2400 m; sometimes hemi-epilithic.

Notes — 1. Corner (1960, 1965) recognized two subspecies, subsp. *sinuata* and subsp. *cuspidata*. However, these taxa are in a number of characters sufficiently different to regard them as species. There is a slight problem that *F. sinuata* is represented by some small-leaved specimens in Sumatra and Java, but these can be distinguished from *F. cuspidata* in the persistent epidermis of the petiole, the flat margin of the lamina, the scabridulous leafy twigs, lower surface of the lamina and/or the (sub)globose fig receptacle, the usually curved lateral veins, and/or the usually somewhat larger and usually subglobose fig receptacles, often with longer peduncles with the bracts mostly scattered. The colour of mature figs may be different as well. Moreover, the altitudinal ranges of the two species are different, although there is some overlap.

2. In the Malay Peninsula, the species is represented by a form with lanceolate laminas, often with one or two broad lobes in the lower part of the lamina and with up to 17 pairs of lateral veins which depart at angles of (almost) 90° from the midrib and are mostly straight (var. *oblonga*). This form is connected with intermediates with the more typical and common form, also in Borneo and Sumatra.

3. Two collections from Mt Singgalang (W Sumatra), belonging undoubtfully to this species, have been made at altitudes between 2000 and 2400 m, far above the common maximum altitude of this species (1400 m) as well as above that of the closely related *F. cuspidata*.

4. For a single collection the label indicates as provenance the Moluccas, but it is doubtful whether that indication is correct. It has not been included in the distribution paragraph.

5. Two collections from Sumatra (Gunung Leuser Nature Reserve) deviate in the length of the petioles, being 1.2–3.5 cm long.

6. The differences between this species and *F. heteropleura*, *F. kuchinensis*, and *F. parietalis* are listed under the first named species.

66. Ficus stipata King

Ficus stipata King, Sp. Ficus 2 (1888) 109, t. 142; Corner, Gard. Bull. Singapore 21 (1965) 78.

Procumbent shrub up to c. 0.5 m tall, or tree (?). *Branchlets* drying pale brown to greyish. *Leafy twigs* 3–4 mm thick, whitish subtomentose, smooth; internodes solid. *Leaves* distichous; lamina oblong, 23–35 by 7.5–13 cm, (almost) symmetric, subcoriaceous to chartaceous, apex subcaudate, base slightly inequilateral, bilaterally auriculate,

margin sinuate to faintly crenate-dentate or subentire, upper surface glabrous, smooth, lower surface subhirtellous to puberulous on the veins, smooth; cystoliths only beneath; midrib slightly prominent to flat above; lateral veins 8–12 pairs, the basal pair running close to the margin of the lamina, up to 1/10–1/5 the length of the lamina, unbranched, tertiary venation scalariform; waxy glands in the axils of both basal lateral veins; petiole 0.3–0.6 cm long, subtomentose to subhirtellous, the epidermis persistent; stipules semi-amplexicaul to amplexicaul, 1.3–1.6 cm long, whitish appressed-puberulous, striate, subpersistent. *Figs* ramiflorous, solitary, or cauliflorous on tuberculate clusters of up to 1.5 cm long leafless branches with short internodes on the older wood; peduncle 1.2–2(–3) cm long; peduncular bracts 2 or 3, scattered, c. 0.5 mm long; receptacle (sub)globose, c. 0.5 cm diam. when dry, sparsely minutely puberulous to subglabrous, smooth, without lateral bracts, colour at maturity unknown, apex convex to umbonate, ostiole c. 1 mm diam., surrounded by a lobed rim; internal hairs absent. *Tepals* whitish, glabrous. *Styles* glabrous.

Distribution — Sumatra (near Padang and near Rengat); at low altitudes.

Note — This species shows similarities to *F. hemsleyana*, from which it clearly differs in the bilaterally auriculate base of the lamina.

67. Ficus subulata Blume

Ficus subulata Blume, Bijdr. (1825) 461; Miq., Fl. Ind. Bat. 1, 2 (1859) 311; Fl. Ind. Bat., Suppl. (1861) 431; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 275, 292; Kurz, Forest Fl. Burma 2 (1877) 452; King, Sp. Ficus 1 (1887) 8, t. 6; Fl. Brit. India 5 (1888) 497; Koord., Minah. (1898) 608; A. Usteri, Beitr. Kenntnis Philipp. (1905) 127; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 149; Renner, Bot. Jahrb. Syst. 39 (1907) 393; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 361; Koord., Atlas Baumart. Java 4 (1916) 749; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 205, f. 4; Merr., Enum. Born. (1921) 227; Enum. Philipp. Flow. Pl. 2 (1923) 66; Ridl., Fl. Malay Penins. 3 (1924) 329; Summerh., J. Arnold Arbor. 10 (1929) 144; Diels, Bot. Jahrb. Syst. 67 (1935) 192; Summerh., J. Arnold Arbor. 22 (1941) 89; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 229; Backer & Bakh.f., Fl. Java 2 (1965) 26; Corner, Gard. Bull. Singapore 21 (1965) 76; Philos. Trans., Ser. B, 253 (1967) 113, t. 37; Kochummen, Tree Fl. Malaya 3 (1978) 158; Tree Fl. Sabah & Sarawak 3 (2000) 245.

Ficus saxatilis Blume, Bijdr. (1825) 460.

Ficus acuminata Roxb., Fl. Ind., ed. Carey 3 (1832) 538; Miq., London J. Bot. 7 (1848) 431; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292.

?*Ficus dicarpa* Blanco, Fl. Filip. (1837) 682; Merr., Sp. Blancoan. (1918) 128.

Ficus salicifolia Miq., London J. Bot. 7 (1848) 431, non Vahl 1790; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292. — *Ficus iteoides* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 315.

Ficus ancolana Miq., Pl. Jungh. (1851) 62. — *Ficus subulata* Blume var. *ancolana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 275.

Ficus sikkimensis Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 225, 292; King, Sp. Ficus 2 (1888) 89, t. 113; Renner, Bot. Jahrb. Syst. 39 (1907) 396; Gagnep., Fl. Indo-Chine 5 (1928) 826.

Ficus subulata Blume var. *boiei* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 275.

Ficus subulata Blume var. *borneensis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 275.

Ficus klinkii Lauterb. & K. Schum., Fl. Schutzgeb. Südsee (1901) 271.

Ficus erythropareia K. Schum. & Warb. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 277; Diels, Bot. Jahrb. Syst. 67 (1935) 194.

Ficus confusa Elmer, Leafl. Philipp. Bot. 1 (1906) 47, 187; 1 (1907) 240; 2 (1908) 535; 4 (1911) 1239, 1387; 7 (1914) 2398; 9 (1937) 3470.

Ficus driveri Elmer, Leafl. Philipp. Bot. 7 (1914) 2397. — *Ficus subulata* Blume forma *driveri* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 231.
Ficus sanhday Gagnep., Notul. Syst. (Paris) 4 (1927) 95; Fl. Indo-Chine 5 (1928) 776.
Ficus subulata Blume forma *minima* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 231.
Ficus subulata Blume forma *ovoidea* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 231.
Ficus subulata Blume forma *sessilis* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 231.

Shrub or tree up to 15 m tall (with drooping branches), often lianescent and/or hemiepiphytic. *Branchlets* drying brown to greyish. *Leafy twigs* 1.5–3 mm thick, sparsely whitish appressed-puberulous to hispidulous to (sub)glabrous, smooth or scabridulous; internodes solid. *Leaves* distichous; lamina oblong to subobovate (to elliptic to subovate or to lanceolate), (5–)10–20(–35) by (1.5–)4–9(–12) cm, somewhat asymmetric to (almost) symmetric, subcoriaceous to coriaceous, apex acuminate to subcaudate, base inequilateral, cuneate to obtuse (to rounded), one side ± clearly decurrent and often slightly (or clearly) auricled, margin entire (occasionally lobate), flat (or in coria-

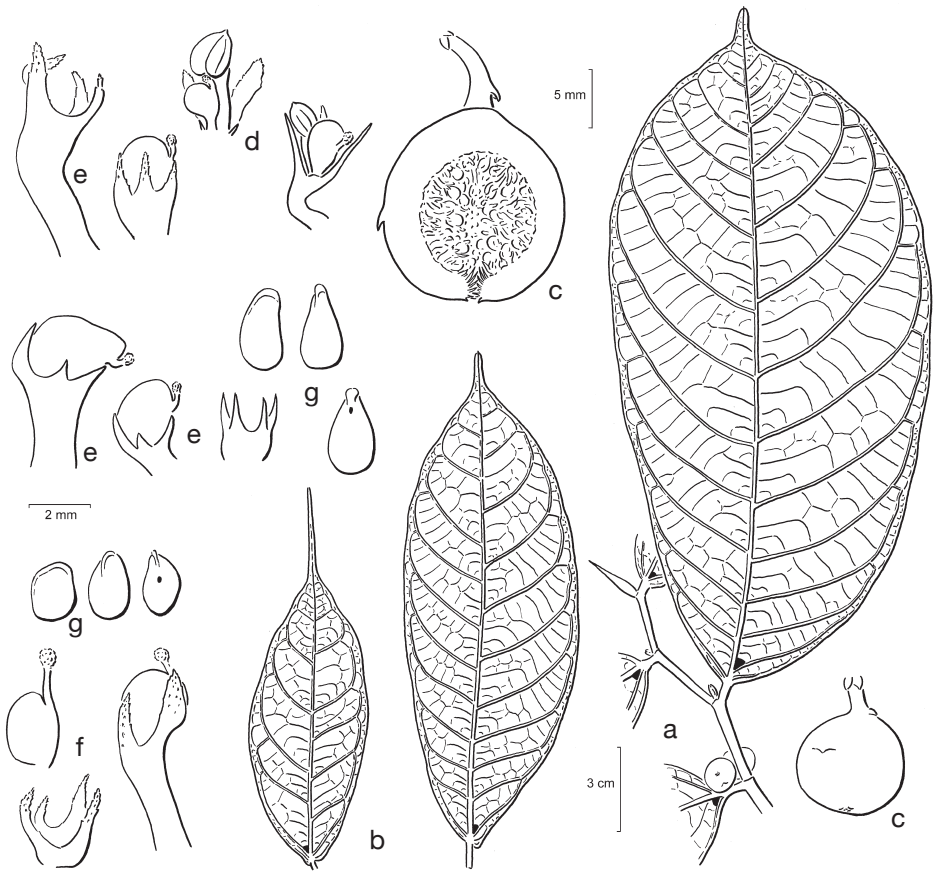


Fig. 55. *Ficus subulata* Blume. a. Leafy twig with figs; b. leaves; c. figs; d. staminate flowers; e. short-styled flowers and perianths; f. long-styled flowers and perianth; g. fruits (all: *Corner s.n.*). From Philos. Trans., Ser. B, 253 (1967) 113.

ceous laminas sometimes ± revolute); both surfaces glabrous, smooth; cystoliths only beneath (or also a few above); midrib slightly prominent to flat above; lateral veins (6–)8–14(–16) pairs, the basal pair hardly different from the other lateral veins, up to 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(–2.7) cm long, glabrous (or whitish puberulous), caducous (or subpersistent), dark brown when dry; terminal buds ± clearly divaricate. *Figs* axillary, solitary or paired, or clustered on spurs, more commonly so on up to 1 cm long spurs below the leaves (ramiflorous), subsessile or with a peduncle up to 0.6(–0.8) cm long; peduncular bracts 3, scattered, 2 (sub)opposite, or 3 verticillate, 0.5–1 mm long; receptacle (sub)globose (to subpyriform), (0.4–)0.5–1 cm diam. when dry, 1–1.5 cm diam. when fresh, glabrous, smooth, with some or without lateral bracts, yellow to orange to red or to red-brown at maturity, apex convex, ostiole c. 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. — **Fig. 55.**

Distribution — From Sikkim to S China to Thailand, Malesia and the Solomon Islands; in *Malesia*: throughout the region to New Britain, but not recorded from Johore, Singapore, Riouw Arch., Banka, and Timor.

Habitat — Lowland and montane forest, at altitudes up to 2000 m.

Notes — 1. The species appears to be quite diverse in its habit, on the labels indicated as shrubs or treelets (apparently terrestrial), epiphytes, stranglers, or straggling or clinging climbers. The plants can produce long whip-like twigs with long internodes (often) with roots on the nodes. With these long branches individuals can establish subepiphytic satellite plants or terrestrial individuals can change into climbers.

2. This species is closely related to *F. gracillima*, from which it differs in various leaf characters, as the venation, apex, and length of the petiole and of the stipules, the larger fig receptacles, the common occurrence of ramiflory, and the non-indurate tepals of the flowers. *Ficus subulata* is essentially a lowland species, but *F. gracillima* is often found at higher altitudes, in particular in eastern New Guinea.

3. Part of the type-collection of *Ficus ellipsoidea* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 230, 295 (p.p. Celebes; alt. p. Ambon), belongs here.

68. Ficus tinctoria G. Forst.

Ficus tinctoria G. Forst., Prod. Fl. Austr. (1786) 76; Willd., Sp. Pl. 4 (1806) 1142; Guill., Ann. Sci. Nat. Bot., Sér. 2, 7 (1837) 185; Miq., London J. Bot. 7 (1848) 436, t. 6-B; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293; Seem., Fl. Vit. (1868) 249, t. 63; Warb., Bot. Jahrb. Syst. 25 (1898) 613; Rech., Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. 85 (1910) 96; Brigham, Mem. Bern. P. Bish. Mus. 3 (1911) 124; Elmer, Leafl. Philipp. Bot. 4 (1911) 1314; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 66; Kaneh., Bot. Mag. Tokyo 49 (1931) 276; Fl. Micron. (1933) 91, f. 20; En. Micron. Pl. (1935) 308; F. Br., Bull. Bish. Mus. 130 (1935) 42, f. 6; Diels, Bot. Jahrb. Syst. 67 (1935) 195; 69 (1938) 399; Summerh., Bull. Bish. Mus. 141 (1936) 55; Occ. Pap. Bish. Mus. 15 (1939) 113; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 226; Luomala, Bull. Bish. Mus. 213 (1953) 69; Fosberg, Phytologia 5 (1955) 289; Corner, Gard. Bull. Singapore 17 (1960) 475; 21 (1965) 74; Philos. Trans., Ser. B, 253 (1976) 11, t. 36.

Shrub or tree up to 15 m tall, terrestrial or hemi-epiphytic, 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 or obliquely (sub)rhombic, (2–)5–20(–30) by (1–)3–8(–13) cm, ± asymmetric, coriaceous, apex (sub)acuminate to subacute (to rounded), base ± inequilateral, cuneate to obtuse to truncate to subcordate or to subattenuate, one side sometimes slightly decurrent, margin entire or unilaterally (angular-) sublobate, often ± 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 flat above; lateral veins 4–9(–11) pairs, the basal pair running close to the margin, up to 1/8–1/3 the length of the lamina, unbranched, most other lateral veins furcate far 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 cm 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 or solitary, sometimes ramiflorous; with a peduncle 0.1–0.6(–1) cm long or (sub)sessile; peduncular bracts 3, mostly verticillate at the base of the peduncle, 1–1.5 mm long; receptacle (sub)globose or ovoid to ellipsoid, 0.5–1 cm diam. when dry, 0.8–1.5 cm diam. when fresh, sparsely minutely hispidulous, scabridulous to almost smooth, without lateral bracts, yellow to orange or (dark) red at maturity, apex ± umbonate, ostiole c. 1 mm diam., surrounded by a rim; internal hairs minute, abundant. *Tepals* whitish, glabrous or ciliolate. *Styles* glabrous.

Habitat & Ecology — Forest, coastal vegetations (beaches, coral rocks, mangroves), coastal and inland limestone cliffs and hills, also secondary growth, at low altitudes; often shrubs or small trees on exposed rocks, often hemi-epiphytic in forest.

Notes — 1. Corner (1960) subdivided the species in a number of subspecies and varieties, but regarding the variation and distribution only two infraspecific taxa can be readily distinguished within the Malesian region; the rank of subspecies is adopted.

2. *Ficus anastomosans* is reinstated as species (see above).

3. The differences between *F. tinctoria*, in particular subsp. *tinctoria*, and *F. virgata* are discussed under the latter.

KEY TO THE SUBSPECIES

1a. Lamina regular in shape, often longer than 10 cm, apex shortly and bluntly acuminate, sometimes rounded, base often clearly inequilateral, often rounded to truncate to subcordate, lateral veins less often furcate . . . . . **a.** subsp. **tinctoria**

b. Lamina often irregular in shape, often shorter than 10 cm, often obliquely rhombic, apex rather long to short, acumen mostly acute, base often almost equilateral, usually (sub)cuneate to subattenuate . . . . . **b.** subsp. **gibbosa**

a. subsp. **tinctoria**

Ficus laeta Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 495, emend. Miq., Fl. Ind. Bat. 1, 2 (1859) 312. — *Ficus altimeeraloo* Roxb. ex Miq. var. *laeta* (Decne.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 277, 293.

Ficus altimeeraloo Roxb. ex Miq., London J. Bot. 7 (1848) 435; Fl. Ind. Bat. 1, 2 (1859) 311; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 277, 293.

Ficus reticulosa Miq., London J. Bot. 7 (1848) 435; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293; King, Sp. Ficus 1 (1887) 6.

Urostigma excelsum Miq., Fl. Ind. Bat. 1, 2 (1859) 350. — *Ficus excelsa* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286, non Vahl 1805.

Ficus validinervis F. Muell. ex Benth., Fl. Austral. 6 (1873) 166; F.M. Bailey, Queensl. Fl. 5 (1902) 1469; Compr. Cat. Qld. Pl. (1913) 486; Domin, Bibl. Bot. 89 (1921) 563.

Ficus swinhoei King, Sp. Ficus 2 (1888) 81, t. 101c; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 468; Kaneh., Formos. Trees (1917) 527; Hayata, Ic. Pl. Formos. 8 (1919) 120; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 51, 226. — *Ficus tinctoria* G. Forst. subsp. *swinhoei* (King) Corner, Gard. Bull. Singapore 17 (1960) 476.

Ficus michelii H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8 (1910) 61.

Ficus chlorosykon Rech., Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. 85 (1910) 96.

Ficus antoniana Elmer, Leafl. Philipp. Bot. 4 (1912) 1374; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 45; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 339.

Ficus fenicis Merr., Philipp. J. Sci. 18 (1921) 66; Enum. Philipp. Flow. Pl. 2 (1923) 52; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 337.

Ficus neoebudarum Summerh., J. Arnold Arbor. 13 (1932) 97. — *Ficus tinctoria* G. Forst. var. *neoebudarum* (Summerh.) Fosberg, Phytologia 5 (1955) 289.

Ficus excelsa auct. non Vahl: Roxb., Fl. Ind., ed. Carey 3 (1832) 552; Wight, Ic. 2 (1843) t. 650, excl. Rheede, Hort. Mal. 3 (1682) 75, t. 58, quae est *F. tinctoria* subsp. *parasitica* (Willd.) Corner.

Ficus gibbosa auct. non Blume: Summerh., J. Arnold Arbor. 10 (1929) 144; 22 (1941) 90.

Lamina regular in shape, often longer than 10 cm, apex shortly and bluntly acuminate, sometimes rounded, base often clearly inequilateral, often rounded to truncate to subcordate, lateral veins less often furcate.

Distribution — Ryukyu Islands, Taiwan to Malesia, extending to Solomon Islands, Australia (northern), Mariana Islands, Caroline Islands, Marshall Islands, New Caledonia, New Hebrides, Rotuma Island, Fiji, Samoa Islands, Cook Islands, Society Islands; in *Malesia*: Philippines (incl. Palawan), Celebes (incl. Sangihe Islands), Lesser Sunda Islands (Sumbawa, Flores, Timor), Moluccas (Talaud Islands, Morotai, Halmahera, Ternate, Sula Islands, Buru, Ceram, Ambon, Banda), New Guinea (incl. New Britain).

Notes — 1. The acumen of the lamina is often acute in the Solomon Islands.

2. The leaves of the collections from the Lesser Sunda Islands are relatively small.

3. In Palawan and some of the Lesser Sunda Islands (as Sumba and Timor), material more or less clearly intermediate between the two subspecies have been collected.

4. It is with some doubt that *F. swinhoei* = *F. tinctoria* subsp. *swinhoei* from the Philippines is included in subsp. *tinctoria*, as it might be more distinct than just a scabrous form of subspecies.

b. subsp. **gibbosa** (Blume) Corner

Ficus tinctoria G. Forst. subsp. *gibbosa* (Blume) Corner, Gard. Bull. Singapore 17 (1960) 476. — *Ficus gibbosa* Blume, Bijdr. (1825) 466; Miq., Pl. Jungh. (1851) 62; Fl. Ind. Bat. 1, 2 (1859) 308; Fl. Ind. Bat., Suppl. (1861) 430; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 276, 292; King, Sp. Ficus 1 (1887) 4,

t. 2; Fl. Brit. India 5 (1888) 496; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 166; Renner, Bot. Jahrb. Syst. 39 (1907) 393; Gibbs, J. Linn. Soc. Bot. 42 (1914)137; Koord., Atlas Baumart. Java 4 (1918) t. 756; Merr., Enum. Born. (1921) 223; Ridl., Fl. Malay Penins. 3 (1924) 329; Gagnep., Fl. Indo-Chine 5 (1928) 799; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1009; Corner, Wayside Trees (1940) 677, t. 251; Gard. Bull. Singapore 21 (1965) 74; Backer & Bakh.f., Fl. Java 2 (1965) 25, 34; Kochummen, Tree Fl. Malaya 3 (1978) 159; Tree Fl. Sabah & Sarawak 3 (2000) 309.

Ficus reticulata Thunb., Diss. Fic. (1786) 6, 12.

Ficus parasitica J. König ex Willd., Mém. Acad. Roy. Sci. Hist. (Berlin) 2 (1801) 102, t. 3; Vahl, Enum. Pl. 2 (1805) 188; Miq., London J. Bot. 7 (1848) 433; Fl. Ind. Bat. 1, 2 (1859); Ann. Mus. Bot. Lugd.-Bat 3 (1867) 276, 292. — *Ficus gibbosa* Blume var. *parasitica* (Willd.) King, Sp. Ficus 1 (1887) 6, t. 2b, f. A. — *Ficus tinctoria* G. Forst. subsp. *parasitica* (Willd.) Corner, Gard. Bull. Singapore 17 (1960) 476; 21 (1965) 75.

Ficus excelsa Vahl, Enum. Pl. 2 (1805) 195; Miq., Ann. Mus. Bot. Lugd.-Bat 3 (1867) 292.

Ficus rhomboidalis Vahl, Enum. Pl. 2 (1805) 199.

Ficus scabriuscula Sm. in Rees, Cycl. 14 (1810) Ficus 51.

Ficus cuneata Blume, Bijdr. (1825) 465, non Hoffmanns 1826. — *Ficus gibbosa* Blume var. *cuneata* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 308; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 276.

Ficus rigida Blume, Bijdr. (1825) 465, non Jack 1822. — *Ficus gibbosa* Blume var. *rigida* (Blume) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 276. — *Ficus gibbosa* Blume var. *rigida* (Blume) Valeton in Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 171, nom. homon., illeg.; Koord., Atlas Baumart. Java 4 (1918) t. 757. — *Ficus tinctoria* G. Forst. subsp. *gibbosa* (Blume) Corner var. *rigida* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 476.

Ficus paradoxa Blume, Bijdr. (1825) 467; Miq., Fl. Ind. Bat. 1, 2 (1859) 308. — *Ficus gibbosa* Blume var. *latifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 276.

Ficus sclerophylla Roxb., Fl. Ind. 3 (1832) 546; Miq., London J. Bot. 7 (1848) 434; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292; King, Sp. Ficus 1 (1887) 6.

Ficus ampelas J. König ex Roxb., Fl. Ind. 3 (1832) 553, non Burm.f. 1768; King, Sp. Ficus 1 (1887) 6.

Ficus tuberculata Roxb., Fl. Ind. 3 (1832) 554; Miq., London J. Bot. 7 (1848) 434; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293. — *Ficus gibbosa* Blume var. *tuberculata* (Miq.) King, Sp. Ficus 1 (1887) 6, t. 2b, f. B.

Ficus irregularis Steud., Nomencl. Bot. ed. 2, 1 (1840) 636.

Ficus pereng Steud., Nomencl. Bot. ed. 2, 1 (1840) 637.

Ficus pervia Miq., London J. Bot. 7 (1848) 433; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293.

Ficus angulata Miq., London J. Bot. 7 (1848) 434.

Ficus angustata Miq., London J. Bot. 7 (1848) 434; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293.

Ficus cuspidifera Miq., London J. Bot. 7 (1848) 434; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293. — *Ficus gibbosa* Blume var. *cuspidifera* (Miq.) King, Sp. Ficus 1 (1887) 6, t. 2a.

Urostigma excelsum Miq., Fl. Ind. Bat. 1, 2 (1859) 350. — *Ficus excelsa* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293, non Vahl 1805.

Urostigma volubile Dalzell in Dalzell & A. Gibson, Bombay Fl. (1861) 242. — *Ficus volubilis* (Dalzell) King, Sp. Ficus 2 (1888) 185.

Ficus gibbosa Blume var. *unigibba* Miq., Fl. Ind. Bat., Suppl. (1861) 430.

Ficus gibbosa Blume var. *pygmaea* Miq., Fl. Ind. Bat., Suppl. (1861) 431.

Ficus subobliqua Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 225.

Ficus subobliqua Miq. var. *latiuscula* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 226.

Ficus gibbosa Blume var. *dodonaeifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 276.

Ficus clarkei King in Hook.f., Fl. Brit. India 5 (1888) 536, Ficus 2 (1888) 175, t. 221; Corner, Gard. Bull. Singapore 21 (1965) 98. — Type: *C.B. Clark s.n.* (CAL n.v.), India, Khasi Hills, consists of leaves of *F. tinctoria* subsp. *gibbosa* and figs of *F. racemosa*, as evident from the plate; the former element is here designated as lectotype.

Ficus pseudobotryoides H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 4 (1907) 67.

Ficus rhomboidalis H. Lév. & Vaniot, Mem. Real Acad. Ci. Barcelona 6 (1907) 153, non Vahl 1805.

Ficus difformis auct. non Lam.: Benth., Fl. Hongk. (1861) 327.

Lamina often irregular in shape, often shorter than 10 cm, often obliquely rhombic, apex rather long to short, acumen mostly acute, base often almost equilateral, usually (sub)cuneate to subattenuate.

Distribution — Sri Lanka, India, Andaman Islands, S China (incl. Hainan), Indochina, Thailand; in *Malesia*: Sumatra, Malay Peninsula, Riouw Arch., Java, Borneo, Philippines (only Palawan), Lesser Sunda Islands (Bali).

69. Ficus uniglandulosa Wall. ex Miq.

Ficus uniglandulosa Wall. ex Miq., London J. Bot. 7 (1848) 431; Fl. Ind. Bat. 1, 2 (1859) 309; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 277, 293; Kurz, Forest Fl. Burma 2 (1877) 453; Corner, Gard. Bull. Singapore 21 (1965) 79; Kochummen, Tree Fl. Malaya 3 (1978) 160; Tree Fl. Sabah & Sarawak 3 (2000) 224.

Ficus subsubulata Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 225, 292; Boerl., Handl. 3 (1900) 369; Merr., Enum. Born. (1921) 227; Corner, Gard. Bull. Singapore 21 (1965) 79. — Syntypes: *Korthals s.n.* (L), Indonesia, Kalimantan, and *Korthals 126* (L) Sumatra, both belong to *F. uniglandulosa*, but have been assigned to different varieties by Corner; the former specimen is designated as lectotype here.

Ficus uniglandulosa Wall. ex Miq. var. *latior* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 277.

Ficus uniglandulosa Wall. ex. Miq. var. *parvifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 277.

Ficus copelandii C.B. Rob., Philipp. J. Sci., Bot. 3 (1908) 176; Elmer, Leafl. Philipp. Bot. 4 (1912) 1385; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 50; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 227.

Ficus pisifera auct. non Wall. ex Voigt: H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 361.

Shrub or tree up to 10(–20?) m tall, often hemi-epiphytic. *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 to elliptic to subobovate (to oblanceolate), (4–)8–20(–28) by (1.5–)3–7(–14) cm, (almost) symmetric, coriaceous to subcoriaceous, apex often ± abruptly acuminate to subcaudate, 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 beneath; 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, up to 1/5–1/3 or 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 furcate 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 or 3, scattered, sometimes 1 on the base of the receptacle, c. 0.2 mm long; receptacle (sub)globose, when dry 0.3–0.6 cm, when fresh 0.6–0.8 cm diam., glabrous, smooth, (usually) without lateral bracts, yellow to orange to red (to purplish) at maturity, apex

convex to slightly umbonate, ostiole c. 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.

Distribution — Myanmar and Thailand; in *Malesia*: Malay Peninsula, Sumatra, Borneo, Philippines (Mindanao, Palawan, Sulu Arch.).

Habitat & Ecology — Forest (margins) and on rocks and cliffs, at altitudes up to 1700(–2300) m; if (pseudo- or hemi-?)epiphytic, then up to 20 m from the forest floor.

Notes — 1. This species shows a considerable and remarkable variation in the venation. Two types of venation (as extremes of the variation) can be distinguished, although connected with numerous intermediates, even in the same specimen:

a. *Lateral veins* few (mostly 4–6 pairs), long, ascending and curved, and (others than the basal ones) often branched or furcate; the tertiary venation is irregular.
b. *Lateral veins* are more numerous (mostly 7–10 pairs), shorter, and (others than the basal ones) less conspicuously curved to almost straight lateral, their loop-connections often forming an arcuate submarginal vein; the tertiary venation is more regular, (in larger leaves) the few 'intercostals' often running parallel to the midrib. The latter type is most frequent in Borneo and includes the type material of var. *parvifolia*).

2. The change of the colour of the twigs due to exfoliation of the periderm is conspicuous and may help to recognize this species.

3. This species can be easily confused with *F. midotis*, but can be distinguished by the prominent (versus flat to impressed) midrib and the absence of additional waxy glands.

70. Ficus virgata Reinw. ex Blume

Ficus virgata Reinw. ex Blume, Bijdr. (1825) 454, non Roxb. 1823; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Boerl., Handl. 3 (1900) 369; Corner, Gard. Bull. Singapore 17 (1960) 477; 21 (1965) 75; Philos. Trans., Ser. B, 253 (1967) 112, t. 36. — *Urostigma virgatum* (Reinw. ex Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 342.

Grossularia domestica Rumph., Herb. Amb. 3 (1743) 136, t. 87, 88.

Ficus insularis Miq., London J. Bot. 7 (1848) 435; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293; Kaneh., Formos. Trees (1917) 519.

Ficus philippinensis Miq., London J. Bot. 7 (1848) 435; Fl. Ind. Bat. 1, 2 (1859) 311; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293; Benth., Fl. Austral. 6 (1873) 173; Náves & Fern.-Vill., Nov. App. (1880) 201; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 252; F.M. Bailey, Queensl. Fl. 5 (1902) 1475; Compr. Cat. Qld. Pl. (1913) 487; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 61; Summerh., J. Arnold Arbor. 22 (1941) 89; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 228, 290; Guillaumin, Fl. Anal. & Synopt. Nouv. Caléd. (1948) 97. — *Ficus virgata* Reinw. ex Blume var. *philippinensis* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 477.

Ficus decaisneana Miq., Fl. Ind. Bat. 1, 2 (1859) 312; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292; King, Sp. Ficus 1 (1887) 6, t. 3; Renner, Bot. Jahrb. Syst. 39 (1907) 393; Summerh., J. Arnold Arbor. 13 (1932) 96; 14 (1933) 62; 22 (1941) 89.

Ficus firmula Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 224, 292. — *Ficus decaisneana* Miq. var. *firmula* (Miq.) King, Sp. Ficus 1 (1887) 7.

Ficus trymatocarpa Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 224, 292, '*trematocarpa*'; Merr., Int. Rumph. (1917) 196; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 227, 292. — *Ficus decaisneana* Miq. var. *trymatocarpa* (Miq.) King, Sp. Ficus 1 (1887) 7, '*trematocarpa*'.

Ficus ellipsoidea Miq., Ann. Mus. Lugd.-Bat. 3 (1867) 230. — Lectotype (here designated): *de Vriese s.n.* (U), Moluccas, Ambon (as suggested by Corner, Gard. Bull. Singapore 21 (1965) 75); the syntype *Teijsmann s.n.* (L) (Celebes, Menado) is *F. subulata*.

Ficus philippinensis Miq. var. *sessilis* Bureau, Ann. Sci. Nat. Bot., Sér. 5, 14 (1872) 253. — *Ficus virgata* Reinw. ex Blume var. *sessilis* (Bureau) Corner, Gard. Bull. Singapore 17 (1960) 478.

Ficus pinkiana F. Muell., Wing's South Sci. Rec. 2 (1882) 273; F.M. Bailey, Queensl. Fl. 5 (1902) 1477; Compr. Cat. Qld. Pl. (1913) 487, f. 489.

Ficus esmeralda F.M. Bailey, Queensl. Agr. J. 1 (1897) 452.

Ficus magnifica Elmer, Leafl. Philipp. Bot. 1 (1906) 51; 1 (1907) 250; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 61. — *Ficus philippinensis* Miq. forma *magnifica* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 228.

Ficus setibracteata Elmer, Leafl. Philipp. Bot. 7 (1914) 2411, 2413; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 66; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 228. — *Ficus philippinensis* Miq. forma *setibracteata* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 229.

Ficus philippinensis Miq. forma *obovata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 229.

Ficus gibbosa auct. non Blume: F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 460.

Tree up to 30 m tall, terrestrial or (hemi-)epiphytic. *Branchlets* drying brown to yellowish. *Leafy twigs* 1–4 mm thick, glabrous; internodes solid. *Leaves* distichous; lamina oblong to elliptic, (2–)6–15(–25) by (1–)3–7.5(–10) cm, ± asymmetric to (almost) symmetric, coriaceous, apex acuminate, base slightly inequilateral, cuneate to (sub)attenuate, one side often slightly decurrent, margin entire, often ± revolute; both surfaces glabrous, smooth; cystoliths on both sides; midrib slightly prominent to flat above; lateral veins (5–)7–10(–11) pairs, the basal pair running close to the margin, up to 1/8–1/5 the length of the lamina, unbranched, the other lateral veins sometimes furcate, tertiary venation (sub)reticulate; waxy glands in the axils of one of the basal lateral veins; petiole 0.2–0.8(–1.5) long, glabrous, the epidermis ± flaking off, usually only on older leaves; stipules amplexicaul, (0.5–)1–2.7 cm long, glabrous or sparsely puberulous or only ciliolate, caducous; terminal buds often ± clearly divaricate. *Figs* axillary or just below the leaves, in pairs or solitary, sometimes in clusters on minute spurs, with a peduncle 0.1–0.5(–0.6) cm long or (sub)sessile; peduncular bracts 3(–6), mostly verticillate in the lower part of the peduncle or at its base, 1–2.5 mm long; receptacle (sub)globose or ovoid or to ellipsoid, 0.3–0.8 cm diam. when dry, 0.8–1.5 cm diam. when fresh, (sub)glabrous or very sparsely hispidulous, smooth (or scabridulous), without (or with 1 or 2) lateral bracts, yellow to orange to red or to purple at maturity, apex convex or umbonate, ostiole c. 1 mm diam., surrounded by a low rim; internal hairs mostly minute, abundant to sparse. *Tepals* whitish or reddish, sparsely minutely puberulous in the lower part. *Styles* glabrous.

Distribution — From Malesia extending to Solomon Islands, New Hebrides (Tanna), New Caledonia, Australia (Queensland); in *Malesia*: Borneo, Philippines (excl. Palawan), Celebes (incl. Sangi Islands), Lesser Sunda Islands (Flores, Alor, Wetar, Timor), Moluccas (Talaud Islands, Sula Islands, Ceram, Ambon, Banda Besar), New Guinea (incl. New Britain).

Habitat & Ecology — Forest and secondary growth; at altitudes up to 1700 m.

Notes — 1. It is peculiar that *F. virgata* is found almost throughout the range of distribution of *F. tinctoria* subsp. *tinctoria*. Although it is likely that these two taxa are distinct at the species level, field studies appear to be necessary to establish the relationships between them. Characters used in the present treatment to separate the

two species are: the length of the stipules, the base of the lamina, and the presence of indumentum on the leafy twigs, petioles, and/or the stipules. In *F. virgata,* the stipules are on most leafy twigs at least 1 cm long (but often shorter on thin twigs) and in *F. tinctoria* at most 1 cm long, rarely up to 1.2 cm in the Malesian region. But outside this region (as in Fiji and the Samoa Islands) the stipules may be up to 2 cm long. The identity of collections from Taiwan and the Ryukyu Islands that have been referred to *F. virgata* is somewhat doubtful, as the stipules tend to be long, the base of the lamina is often subattenuate, and the epidermis of the petioles of the youngest leaves is often not yet flaking off. However, the indumentum on the leafy twigs and the common presence of waxy glands in the axils of both basal lateral veins, as well as the relatively long fig peduncles (usually 0.5–1 cm long) suggest that they belong to *F. tinctoria* (subsp. *tinctoria*) rather than to *F. virgata*. In *F. virgata*, the base of the lamina is more or less distinctly attenuate, but mostly not so in *F. tinctoria* subsp. *tinctoria*. The leafy twigs, petioles, laminas, and stipules of *F. virgata* are entirely glabrous (at least in the Malesian region), but in *F. tinctoria* subsp. *tinctoria* at least the leafy twigs are hispidulous or sometimes puberulous, the hispidulous surfaces are often scabridulous, and the stipules are often ciliolate. Moreover, in *F. virgata* the epidermis is usually not yet flaking off from the petioles of the youngest leaves, but in *F. tinctoria* the epidermis is usually flaking off also from petioles of the youngest leaves. The tepals of the pistillate flowers are mostly sparsely appressed-puberulous outside, whereas (mostly) minutely ciliolate in *F. tinctoria*.

2. In the eastern part of the range of distribution the number of peduncular bracts (at the base of the peduncle, if present) can be up to 6. Moreover, these bracts are often relatively large, 1.5–2.5 cm long.

3. The tepals are mostly whitish, but in many collections from the Philippines they are reddish.

4. The figs are often subsessile or shortly pedunculate. In some of the collections from the Philippines the peduncles can be up to 0.6 cm long.

5. The identity of the material from the Caroline Islands referred to *F. virgata* by Corner (1965) could not be verified.

6. Due to the relatively long stipules and the ± divaricate terminal buds this species can be confused with *F. subulata* subsp. *subulata*. However, the stipules of the latter are usually dark brown to blackish when dry, whereas those of *F. virgata* are mostly greenish to pale brown when dry, Moreover, the tertiary venation is usually distinctly scalariform in *F. subulata* subsp. *subulata*, but (sub)reticulate in *F. virgata*.

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FICUS subgenus SYCOMORUS

Ficus L. subg. *Sycomorus* (Gasp.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; Mildbr. & Burret, Bot. Jahrb. Syst. 46 (1912) 175; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 179. — *Sycomorus* Gasp., Giorn. Bot. Ital. 2 (1844) 219; Rendiconti Reale Accad. Sci. Fis. 25 (1845) 86; Ann. Sci. Nat. Bot., Sér. 3, 1 (1845) 348; Miq., London J. Bot. 7 (1848) 109; Corner, Gard. Bull. Singapore 21 (1965) 34.

Trees or shrubs, with white or yellowish latex, monoecious or (gyno)dioecious. *Leafy twigs* with the internodes often hollow or, if solid, then often with copious pith, when dry the internodes and nodes often more or less distinctly different in diameter; nodal waxy glands often present; periderm often flaking off. *Leaves* spirally arranged, (partly) subopposite or (partly) distichous; lamina variable, often chartaceous to subcoriaceous, margin often denticulate or dentate, venation variable; waxy glands in the axils of the basal lateral veins and/or in the axils of other lateral veins or furcations of lateral veins; petiole with the epidermis often flaking off; stipules fully amplexicaul. *Figs* in pairs or solitary in the leaf axils and/or on spurs in the leaf axils or on the older wood and/or on variously shaped leafless branchlets on the older wood down to the base of the trunk, stout and erect, slender and pendulous or stolon-like, with 3(–7) basal bracts, verticillate or ± scattered, persistent; receptacle often depressed-globose or (sub)pyriform, often stipitate, often with lateral bracts, ostiole usually with more than 3 ostiolar bracts visible and often surrounded by apical bracts or ribs. *Staminate flowers* in one (or a few) rows near the ostiole, sessile or pedicellate, usually subtended by 2 (or 3) bracteoles; perianth with 2 or 3 free or connate tepals, at least one of them distinctly cucullate, covering the apex of the perianth, glabrous; stamens 2 or less often 1, without pistillode. *Pistillate flowers* with (2–)3–6 tepals, connate to (almost) free or reduced in size to (almost) absent, glabrous, style subapical to subbasal, glabrous or hairy; stigma one, (sub)clavate to truncate to ± infundibuliform. *Fruits* achenes, smooth or tuberculate and/or keeled, reddish or whitish.

DISTRIBUTION

The subgenus comprises c. 155 species in an area ranging from W Africa to N Australia and Fiji. Thirty species occur outside the Malesian region, 12 in Africa and Madagascar (and adjacent islands), all members of sect. *Sycomorus*, 15 in the Solomon Islands and Fiji, and 5 are confined to the Sino-Himalayan region. The subgenus is most speciose and diverse in New Guinea, in particular its eastern part (and the Solomon Islands).

MORPHOLOGY

Habit — The habit ranges from trees of considerable height to shrubs. About 10 species are or can be rheophytic (see Van Steenis 1981). They are adapted to that life-form by growth-form and leaf-characters, but *F. macrostyla* (Borneo) and *F. squamosa* Roxb. (Sino-Himalayan region) are also adapted to the rheophytic life-form by the construction of the diaspores which apparently facilitates attachment to the substrate. All species are terrestrial. In many of the species cauliflory and flagelliflory (geocarpy) are

conspicuous features of the tree habit. In flagelliflorous species leaf-bearing shoots may arise from the stolons.

Leaves — The leaves are spirally arranged, (partly) subopposite, or (partly) distichous, at least on ultimate branches. A change from spiral arrangement of the leaves to (sub)opposite and/or subsequent distichous arrangement may take place during the development of the tree.

The leaves are symmetric or, in particular in connection with distichous arrangement, more or less pronouncedly asymmetric. The lamina is often chartaceous and, in conjunction with this texture, the lamina margin often dentate or denticulate, mostly towards the apex of the lamina.

Waxy glandular spots — Pairs of waxy glandular spots on the nodes are common in this group. If such nodal waxy glands are present, glandular spots may be absent on the lower surface of the lamina or absent in the most common location of these glands, namely the axils of the basal lateral veins. In sect. *Sycocarpus*, the waxy glands are commonly found in the axils of some of the lateral veins in the middle of the lamina, often in slit-shaped extensions of the axils. In addition to glandular spots in the axils of the basal lateral veins, small(er) glandular spots often occur in axils of other lateral veins and/or furcations of the lateral veins.

Inflorescences — The inflorescences occur solitary or in pairs in the leaf axils, often in clusters of more than two on short-shoots (spurs) in the leaf axils and often also below the leaves on the older wood or on variously shaped or clustered (branched or unbranched) leafless branchlets on the older wood, knobbly branchlets, more elongate but still stout branchlets, long slender pendulous branchlets on the older wood, down to the trunk, or very long stolon-like branchlets departing from the base of the trunk. Various types of fig bearing branchlets may occur on the same tree or in the same species. Even combinations of axillary and cauliflorous inflorescences in various degrees may occur.

The inflorescences vary considerably in size, from c. 0.3 cm diam. when dry (in *F. minahassae*) to about 10 cm diam. (in *F. dammaropsis*). The receptacle often bears lateral bracts, one to numerous, small to large. There are often 5 or more (± distinct) bracts around the ostiole (apical bracts). The number of basal bracts is mostly 3, sometimes there are a few more. They are distinctly verticillate or may be ± scattered.

Interfloral bracts are absent, the staminate flowers are subtended by bracteoles. Internal (or interfloral) bristles are present (often) or absent (less often).

The syconia are often filled with watery fluid during the interfloral phase (and the beginning of the male phase) of the development.

Mature figs are often greenish to yellowish, to yellow-orange, or yellow-brown. Bright colours, as red, are less frequent, sometimes mature figs turn purple to black.

Staminate flowers — The staminate flowers are always arranged in one or some rows near the ostiole and in the majority of the species the staminate flowers are subtended by 2 or sometimes 3 bracteoles. The third bracteole might represent a bract, which differs in shape and length from the bracteoles, as found in *F. cynaroides* (Solomon Islands)

and *F. dammaropsis*. However, bracteoles appear to be lacking in small figs, as in *F. endochaete*, *F. minahassae*, and *F. pungens,* and might be lacking in other species with small figs as well. The perianth consists of 2 or 3 tepals, at least one of them with a cucullate apex covering the top of the flower. The tepals are free or connate, forming a tubular structure with cucullate lobes and (tightly) enclosing the stamens. With such a construction of the perianth, the upper part of the saccate perianth is torn off by elongation of the filaments at anthesis. The flower contains 2 stamens or less commonly 1 stamen. Pistillodes are absent.

The fully closed staminate flower may give anthers and pollen protection against fluid in figs (see above).

Pistillate flowers — The perianth consists of 3–6 free, partly connate or (almost) fully connate tepals. In the latter case the perianth can be fully developed, leaving a narrow opening to let through the style (often through a narrow tubular extension of the perianth) or it is more or less strongly reduced to a cupular or annular structure subtending the ovary. In sect. *Sycocarpus*, the perianths of long- and short-styled flowers are often different: mostly short (to vestigial) in long-styled flowers and enclosing the ovary (or also the basal part of the style) in the short-styled flowers. The style is often lateral to subbasal. The stigma varies from clearly clavate to 'flame-shaped' or to infundibuliform to truncate.

Fruits — The achenes are auriculiform to lenticular, with or without a (double) keel, with or without a prominent 'pseudohilum' (where the style was attached to the ovary), and with a smooth or more or less tuberculate surface. The features of the fruits are mostly constant or predominant in the sections.

Dioecy–monoecy — In contrast to the other subgenera, subg. *Sycomorus* comprises both monoecious and dioecious species; 16 species, or about 10% of the total number, are monoecious. The majority of the monoecious species belongs to sect. *Sycomorus*, of which 12 species are found in the African–Madagascan flora region and only *F. racemosa* outside this region, ranging from Asia to Australia. Two other (closely related) monoecious species, *F. microdictya* and *F. pritchardii* Seem., belong to sect. *Papuasyce*, in the easternmost part of the range of the subgenus. The third species of this section, *F. itoana*, is dioecious with in the seed figs neuter flowers instead of staminate ones and staminate flowers in the 'gall figs'. In both types of figs the pistillate flowers are arranged as in monoecious species and the styles varies in length (see Weiblen, Syst. Biol. 53 (2004) 134).

The monoecious and dioecious states are not accompanied by conspicuous morphological differences in vegetative parts or overall features of the syconia and neither by different groups of pollinators. This suggests that the two states occur in phyllogenetically closely related entities. Intermediate states have not been encountered. Analyses partly based on molecular data (Weiblen 2000) indicate that monoecious state in the unrelated groups of the subgenus is the result of reversal events.

DELIMITATION AND SUBDIVISION

Delimitation — The current concept of the subgenus differs essentially from that developed by Corner (1958, 1960a, b, 1962), as the subgenus does not only comprise the largely African–Madagascan group of dioecious species (subg. *Sycomorus* in Corner's classification), but also the following subdivisions of subg. *Ficus* as defined by Corner (1960a: 417, 1965): sect. *Adenosperma*, sect. *Neomorphe*, sect. *Sycocarpus*, sect. *Ficus* ser. *Rivulares* (with only *F. rivularis*) and ser. *Pseudopalmeae* (with only *F. pseudopalma*), sect. *Sycidium* ser. *Prostratae* and ser. *Pungentes*, as well as *F. pritchardii* (transferred from subg. *Pharmacosycea* sect. *Oreosycea*, Corner 1970).

The unifying feature is the presence of 2 (or 3) bracts or bracteoles subtending the staminate flowers with tubular perianths enclosing the stamen(s). However, it is a feature not present in all species ranked in this subgenus: they are absent in some species with very small figs (see above). Cauliflory (including its geocarpic variant flagelliflory), nodal waxy glands, hollow internodes of the leafy twigs, and lateral bracts on the fig receptacle are common features. In contrast to the other subgenera, *Sycomorus* comprises both monoecious and (gyno)dioecious species in both of its major subdivisions.

There are clear overall similarities between subg. *Sycomorus* and subg. *Sycidium*, as the frequent occurrence of cauliflory, the arrangement of the leaves and the often asymmetric and subcoriaceous to chartaceous lamina, and the frequent occurrence of lateral bracts on the fig receptacle.

But subg. *Sycidium* differs in the consistent presence of pistillodes in the staminate flowers, the frequently semi-amplexicaul to lateral stipules, the often scattered 'basal bracts', and the absence of two stigmatic arms. The lamina mostly dries greenish against brownish in subg. *Sycomorus*.

Subg. *Synoecia* clearly differs in the habit of root-climbers with leaf dimorphy. Subg. *Ficus* differs in the always symmetric lamina, the absence of cauliflory and lateral bracts on the fig receptacle.

Subdivision — Proposing a subdivision of subg. *Sycomorus* is less easy than for the other subgenera. The majority of the species can be accommodated without doubt in the major sections *Adenosperma*, *Sycocarpus*, and *Sycomorus*, as well as in the smaller sections *Dammaropsis* and *Papuasyce*. An important differentiating floral character used is found in the perianth of the pistillate flower: the tepals free or nearly so or the tepals fused, entirely or largely so. In a few species this distinction is unclear. *Ficus auriculata* comprises individuals of which the tepals are entirely connate and others in which they are free. This has created some confusion with regard to the position of *F. oligodon* (currently included in *F. auriculata*), see Corner (1962: 395) and (1978: 383). The other problematical species is *F. indigofera* Rech. showing a considerable variation in the degree of connation of the tepals, see Corner (1967: 135).

Corner (1960a: 418, 1969: 321) placed *F. pseudopalma* in (his) section *Ficus* because of the free tepals of the pistillate flowers and the related species *F. rivularis* as well, in spite of connate tepals. Evident relatives of *F. pseudopalma*, currently accommodated in section *Dammaropsis* have (largely) connate tepals.

Another problem is linked to several Melanesian species. *Ficus cynaroides* Corner, *F. immanis* Corner, and *F. lancibracteata* Corner, were placed by Corner (1960b: 38,

1967: 122) in ser. *Cynaroides* of subsect. *Auriculisperma* (sect. *Sycocarpus*). These three species resemble species of sect. *Sycocarpus* subsect. *Sycocarpus* except in the shape of the fruits, and probably also in the absence of internal hairs and hairs on the styles, both usually present in subsect. *Sycocarpus*.

The situation with regard to *F. indigofera* and *F. vitiensis* is similar. Corner (1960b: 38, 1967: 123) placed them in ser. *Vitienses* of subsect. *Auriculisperma* (sect. *Sycocarpus*). In particular *F. indigofera* resembles, even in the presence of *Terminalia*-branching, species placed in sect. *Adenosperma*, but it differs in the presence of entirely connate tepals of pistillate flowers and probably also in the absence of internal hairs.

These two sets of species differ also in having pollinators of subg. *Strepitus* and not of the subgenera *Rothropus* (as found in the majority of the species of subsect. *Sycocarpus)* or of *Ceratosolen* as found in all species of sect. *Adenosperma* and some species of subsect. *Sycocarpus*). *Rothropus* is also involved in the pollination of the sections *Dammaropsis* and *Papuasyce* (Wiebes 1994).

In spite of the morphological differences indicated and the different groups of pollinators involved, *F. cynaroides* and its relatives and *F. indigofera* and its relative are currently included in subsect. *Sycocarpus* and sect. *Adenosperma*, respectively.

The auriculiform to lenticular fruits without prominent pseudohilum (as characteristic for subsect. *Sycocarpus*) or a double keel (as characteristic for sect. *Adenosperma*) are also found in the two rheophytic species in subsect. *Macrostyla* (of sect. *Sycocarpus*). This type of fruit, being the unifying character of sect. *Auriculisperma* Corner (1960b: 38), belongs thus to species in the easternmost part of the range of the subgenus.

It is curious that the various small groups of species are so diverse but share the same type of fruit and the same group of pollinators with the possible exception of the *Macrostyla* species for which the pollinators are not known.

The position of the three species placed in sect. *Hemicardia* and the two placed in sect. *Bosscheria* is somewhat problematical as discussed below.

Survey of the subdivisions
(The numbers give the total numbers of species, followed by the numbers of Malesian species)

Subg. *Sycomorus*(c.155 : c.120)
- Sect. *Sycomorus* (18 : 6)
  - Subsect. *Sycomorus* (13 : 1)
  - Subsect. *Neomorphe* (6 : 6)
- Sect. *Adenosperma* (19 : 16)
- Sect. *Bosscheria* (2 : 2)
- Sect. *Dammaropsis* (5 : 3)
- Sect. *Hemicardia* (3 : 1)
- Sect. *Papuasyce* (3 : 2)
- Sect. *Sycocarpus* (86 : 73)
  - Subsect. *Sycocarpus* (84 : 72)
    - 'Axillares'
      - *Ficus calcarata*-group
      - *Ficus lepicarpa*-group

(Subsect. *Sycocarpus*)
- 'Cauliflorae'
  - *Ficus congesta*-group
  - *Ficus pachyrrhachis*-group
- 'Flagelliflorae'
  - *Ficus geocarpa*-group
  - *Ficus ribes*-group
  - *Ficus stolonifera*-group
  - *Ficus subterranea*-group
- Mixed
  - *Ficus cereicarpa*-group

Subsect. *Macrostyla* (2 : 1)

POLLINATORS

The pollinators belong to the genus *Ceratosolen* in which three subgenera are distinguished (Wiebes 1994).

Subg. *Ceratosolen* is found in the species of sections *Adenosperma*, *Bosscheria*, and *Sycomorus*, some species of sect. *Sycocarpus*, and in *F. pritchardii*, one of the three species of sect. *Papuasyce*. Subg. *Rothropus* is found in the majority of the species of sect. *Sycocarpus*, and subg. *Strepitus*, is associated with sect. *Dammaropsis* and found in two other species of sect. *Adenosperma* and sect. *Papuasyce*. Some species of *Ceratosolen* (subg. *Ceratosolen*) are found in species of subg. *Sycidium* (*F. asperiuscula* and *F. complexa*).

Males of *Ceratosolen* show (mostly/always?) respiratory adaptations because of the (usual) presence of liquid in the syconia and they (mostly/always?) cut off anthers, which can be found scattered in the syconium (see p. 54).

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KEY TO THE SECTIONS AND SUBSECTIONS

1a. Leaves (sub)opposite 2
b. Leaves spirally arranged or distichous 3
2a. Rheophytic shrub with stolon-like rooting stems; perianth of pistillate flowers rudimentary to absent; styles of long-styled flowers 0.8–1.5 cm long . . . . . Subsect. **Macrostyla**
b. Tree or shrub, if rheophytic then facultatively; perianth of pistillate flowers usually well developed, sometimes rudimentary in long-styled flowers; styles of long-styled flowers up to 3 mm long . . . . . Subsect. **Sycocarpus**
3a. Leaves (sub)distichous 4
b. Leaves spirally arranged 7
4a. Lamina glabrous and the margin entire . . . . . Sect. **Dammaropsis** p.p.
b. Lamina hairy and/or the margin dentate to denticulate 5
5a. Tepals of pistillate flowers entirely or largely connate; waxy glands mostly in the axils of lateral veins in the middle of the lamina . . . . Subsect. **Sycocarpus** p.p.
b. Tepals of pistillate flowers (almost) free; waxy glands mostly in the axils of the basal lateral veins at one side of the lamina 6

6a. Figs axillary . . . . . Sect. **Adenosperma** p.p.
b. Figs mostly cauliflorous or flagelliflorous . . . . . Sect. **Hemicardia**
7a. Rheophytic shrub with stolon-like rooting stems; perianth of pistillate flowers rudimentary to absent; styles of long-styled flowers 0.8–1.5 cm long . . . . . Subsect. **Macrostyla**
b. Tree or shrub, if rheophytic then facultatively; perianth of pistillate flowers usually well developed, sometimes rudimentary in long-styled flowers; styles of long-styled flowers up to 3 mm long 8
8a. Tree or shrub with *Terminalia*-branching (the proximal internodes of branches much longer than the distal ones) . . . . . Sect. **Adenosperma** p.p.
b. Tree or shrub without *Terminalia*-branching 9
9a. Tree; figs small, cauliflorous, in globose heads or clustered on the fig-bearing branchlets; tepals of pistillate flowers free . . . . . Sect. **Bosscheria**
b. Tree or shrub; figs large to small, or if cauliflorous, then not in distinct clusters or heads; tepals of the pistillate flowers entirely or largely connate 10
10a. Tree monoecious (or dioecious); figs containing staminate or neuter flowers and pistillate flowers with different style-lengths 11
b. Tree or shrub dioecious; figs either with staminate flowers and short-styled pistillate flowers or only with long-styled pistillate flowers 12
11a. Tepals of pistillate flowers free; fruits brownish . . . . . Subsect. **Sycomorus**
b. Tepals of pistillate flowers connate; fruits whitish . . . . . Sect. **Papuasyce**
12a. Tree or shrub monocaul or sparingly branched, most parts glabrous or with inconspicuous indumentum and waxy glands present in the axils of the basal lateral veins . . . . . Sect. **Dammaropsis** p.p.
b. Tree or shrub usually well branched, or if monocaul to sparingly branched, then conspicuously hairy and/or waxy glands absent in the axils of the basal lateral veins 13
13a. Lamina symmetric, with waxy glands at least present in slit-shaped extensions of the axils of the basal lateral veins beneath; tepals of pistillate flowers mostly free . . . . . Subsect. **Neomorphe**
b. Lamina often asymmetric, with waxy glands rarely present in the axils of the basal lateral veins beneath, or if present, then not in slit-shaped extensions of these axils, usually present in the axils of lateral veins in the middle of the lamina; tepals of pistillate flowers (entirely) connate (or absent) . . . . . Subsect. **Sycocarpus** p.p.

KEY TO THE SPECIES

1a. Leaves (sub)opposite 2
b. Leaves spirally arranged or distichous 3
2a. Rheophytic shrub with stolon-like rooting stems; perianth of pistillate flowers rudimentary to absent; styles of long-styled flowers 0.8–1.5 cm long. — Borneo . . . . . **102. F. macrostyla**
b. Tree or shrub, if rheophytic then facultatively; perianth of pistillate flowers usually well developed, sometimes rudimentary in long-styled flowers; styles of long-styled flowers up to 3 mm long 36

3a. Leaves (sub)distichous 4
b. Leaves spirally arranged 8
4a. Lamina glabrous and the margin entire. — Philippines . . . . . **27. F. rivularis**
b. Lamina hairy and/or the margin dentate to denticulate 5
5a. Tepals of pistillate flowers entirely or largely connate; waxy glands mostly in the axils of lateral veins in the middle of the lamina 36
b. Tepals of pistillate flowers (almost) free; waxy glands mostly in the axils of the basal lateral veins at one side of the lamina 6
6a. Figs mostly cauliflorous or flagelliflorous. — Malay Peninsula . . . . . **28. F. semicordata**
b. Figs axillary 7
7a. Lamina scabrous above. — New Guinea, Moluccas . . . . . **22. F. umbonata**
b. Lamina smooth above. — New Guinea . . . . . **12. F. endochaete**
8a. Rheophytic shrub with stolon-like rooting stems; perianth of pistillate flowers rudimentary to absent; styles of long-styled flowers 0.8–1.5 cm long. — Borneo . . . . . **102. F. macrostyla**
b. Tree or shrub, if rheophytic then facultatively; perianth of pistillate flowers usually well developed, sometimes rudimentary in long-styled flowers; styles of long-styled flowers up to 3 mm long 9
9a. Tree or shrub with *Terminalia*-branching (the proximal internodes of branches much longer than the distal ones) 23
b. Tree or shrub without *Terminalia*-branching 10
10a. Tree; figs small, cauliflorous, in globose heads or clustered on the fig-bearing branchlets; tepals of pistillate flowers free 11
b. Tree or shrub; figs large to small, or if cauliflorous then not in distinct clusters or heads; tepals of pistillate flowers entirely or largely connate 12
11a. Figs in heads. — N Borneo, Philippines, Celebes . . . . . **23. F. minahassae**
b. Figs in clusters. — Celebes, Moluccas, New Guinea . . . . . **24. F. pungens**
12a. Tree monoecious; figs containing staminate flowers and pistillate flowers with different style-lengths 13
b. Tree or shrub dioecious; figs either with staminate flowers and short-styled pistillate flowers or only with long-styled pistillate flowers 15
13a. Tepals of pistillate flowers free; fruits brownish. — Widespread **1. F. racemosa**
b. Tepals of pistillate flowers connate; fruits whitish 14
14a. Basal lateral veins up to 1/6–1/4 the length of the lamina; peduncle 1.5–3.5 cm long. — New Guinea . . . . . **29. F. itoana**
b. Basal lateral veins 1/4–1/3(–1/2) the length of the lamina; peduncle 0.3–1.5 cm long. — New Guinea . . . . . **30. F. microdictya**
15a. Tree or shrub monocaul or sparingly branched, most parts glabrous or with inconspicuous indumentum and waxy glands present in the axils of the basal lateral veins 16
b. Tree or shrub usually well branched, or if monocaul to sparingly branched, then conspicuously hairy and/or waxy glands absent in the axils of the basal lateral veins 17

16a. Lateral veins 20–24 pairs. — Philippines . . . . . **26. F. pseudopalmas**
b. Lateral veins 8–12 pairs. — New Guinea . . . . . **25. F. dammaropsis**
17a. Lamina symmetric, with waxy glands at least present in slit-shaped extensions of the axils of the basal lateral veins beneath; tepals of pistillate flowers mostly free 18
b. Lamina often asymmetric, with waxy glands rarely present in the axils of the basal lateral veins beneath, or if present, then not in slit-shaped extensions of these axils, usually present in the axils of lateral veins in the middle of the lamina; tepals of pistillate flowers (entirely) connate (or absent) 36
18a. Lamina ± scabrous above. — New Guinea . . . . . **4. F. robusta**
b. Lamina smooth above 19
19a. Lamina ± densely hairy beneath, also on the smaller veins; stipules hairy . . . 20
b. Lamina glabrous or ± sparsely (minutely) puberulous on the main veins beneath; stipules glabrous or hairy 22
20a. Waxy glands not in slit-shaped extensions of the axils of the basal lateral veins beneath; basal bracts 4–7 mm long, persistent; ostiole (4–)6–10(–12) mm diam. — Malay Peninsula . . . . . **2. F. auriculata**
b. Waxy glands in slit-shaped extensions of the axils of the basal lateral veins beneath; basal bracts 2–4 mm long, caducous or persistent; ostiole 2–4 mm diam. 21
21a. Stipules brownish (sub)sericeous, 0.8–1.5 cm long; lamina beneath densely tomentose on the veins; small nodal waxy glands absent. — New Guinea . . . . . **5. F. semivestita**
b. Stipules whitish (to yellowish) (sub)sericeous, mostly 1.5–2.5 cm long; lamina beneath sparsely to rather densely puberulous on the veins or glabrous. — Moluccas, New Guinea . . . . . **3. F. nodosa**
22a. Stipules whitish (to yellowish) (sub)sericeous, mostly 1.5–2.5 cm long; usually with small nodal waxy gands. — Moluccas, New Guinea . . . . . **3. F. nodosa**
b. Stipules glabrous or, if hairy, then yellowish and often only at the base and/or the apex; nodal waxy glands absent. — Widespread . . . . . **6. F. variegata**
23a. Stipules (1–)1.5–6 cm long, coriaceous, persistent; lamina 25–50 cm long . 24
b. Stipules 0.5–3 cm long, usually caducous, sometimes subpersistent; lamina shorter than 25 cm 25
24a. Lamina distinctly puberulous to hirtellous in the main veins beneath. — New Guinea . . . . . **15. F. megalophylla**
b. Lamina subglabrous beneath, only with minute brown pluricellular trichomes. — New Guinea . . . . . **18. F. saccata**
25a. Midrib of lamina hairy above; basal bracts caducous 26
b. Midrib of lamina (becoming) glabrous above; basal bracts persistent 27
26a. Shrub up to 1 m tall; fig receptacle c. 0.8 cm diam. when dry. — New Guinea . . . . . **20. F. suffruticosa**
b. Tree; fig receptacle 1.8–2.5(–3) cm diam. when dry. — New Guinea . . . . . **19. F. subcuneata**
27a. Shrub with the leaves conspicuously tufted; leafy twig and lamina (sub)glabrous. — Moluccas, New Guinea . . . . . **8. F. arbuscula**

b. Tree, or if a shrub, then the leafy twigs and lamina distinctly hairy 28
28a. Lamina above and beneath minutely pustulate by cystoliths 29
b. Lamina only beneath minutely pustulate by cystoliths 31
29a. Tertiary venation of lamina reticulate or at most subscalariform with at most 4 (rarely 5) intercostals. — Celebes, Moluccas, New Guinea . **7. F. adenosperma**
b. Tertiary venation of lamina distinctly scalariform with at least 6 intercostals 30
30a. Leafy twigs glabrous; apex of lamina abruptly acuminate. — New Guinea . . . . . **11. F. comitis**
b. Leafy twigs hairy; apex of lamina gradually acuminate. — New Guinea . . . . . **16. F. mollior**
31a. Leafy twigs, lamina and stipules glabrous or at most appressed-puberulous . 32
b. Leafy twigs, lamina and often also the stipules conspicuously hairy 33
32a. Stipules 2–4.5 cm long. — Moluccas, New Guinea . . . . . **9. F. austrina**
b. Stipules 1–2 cm long. — Moluccas, New Guinea . . . . . **10. F. casearioides**
33a. Midrib of lamina beneath with appressed hairs of about equal length; indumentum of lamina beneath usually confined to the midrib and lateral veins; base of lamina cuneate to obtuse. — Celebes, Moluccas, New Guinea . .**13. F. erythrosperma**
b. Midrib of lamina beneath with short (crinkled or straight) hairs ± covered by much longer straight hairs; indumentum of the lamina beneath also on the smaller veins, if not so, then the base of the lamina subcordate to emarginate 34
34a. Midrib of lamina beneath minutely whitish puberulous and with much longer appressed whitish hairs; the smaller veins (sub)glabrous; stipules often subglabrous. — New Guinea . . . . . **17. F. pilulifera**
b. Midrib of lamina beneath with whitish to brownish short crinkled hairs and longer brownish hairs; indumentum of lamina beneath usually also on the smaller veins; stipules mostly at least partly hairy 35
35a. Lamina above initially hairy, at least on the midrib, this indumentum soon disappearing; figs receptacle 0.8–1.5 cm diam. when dry. — New Guinea . . . . . **21. F. trichocerasa**
b. Lamina above also initially entirely glabrous; fig receptacle 1.8–3 cm diam. when dry. — Moluccas, New Guinea . . . . . **14. F. funiculosa**
36a. Figs predominantly on leafless branchlets on the older wood 37
b. Figs predominantly axillary (species with axillary figs (solitary, in pairs or on spurs), only axillary or also below the leaves, down to the trunk for individual trees or for the species) 38
37a. Figs predominantly flagelliflorous (geocarpic), on stolons departing from the base of the trunk (species with flagelliflorous figs of subsect. Sycocarpus) 61
b. Figs predominantly cauliflorous, on leafless branchlets or tubercles on the older wood (subsect. Sycocarpus – for cauliflorous non-geocarpic species; figs on various types of leafless branchlets on the (main) branches, the trunk or only at the base of the trunks, varying from very short tuberculate, rather short to up to 50 cm long much-branched, stout sparingly branched with short internodes or slender up to 1 m or more long (these sometimes extending to the soil or litter)) 105
38a. Stipules (sub)persistent 39
b. Stipules caducous 53

39a. Lamina scabrous above 40
b. Lamina smooth above 45
40a. Lamina pandurate, dentate to partly lobate-dentate 41
b. Lamina not more or less distinctly constricted below the middle 42
41a. Margin of lamina with large teeth, almost lobes, (mainly) in the upper part of the lamina. — Celebes . . . . . **49. F. decipiens**
b. Margin of lamina with large teeth, almost lobes, in the basal part of the lamina. — New Guinea . . . . . **84. F. saurauioides**
42a. Stipules 4–6 cm long. — New Guinea . . . . . **70. F. nana**
b. Stipules 1.5–4 cm long 43
43a. Lamina elliptic to obovate (or oblong to subobovate); figs (usually) with some lateral bracts. — Celebes?, Moluccas . . . . . **40. F. calcarata**
b. Lamina oblong to lanceolate; figs without lateral bracts 44
44a. Fig receptacle c. 2 cm diam. when dry; basal bracts 5–15 mm long. — Celebes . . . . . **62. F. latimarginata**
b. Figs receptacle 1–1.3 mm diam. when dry; basal bracts 2.5–4 mm long. — New Guinea . . . . . **84. F. saurauioides**
45a. Petioles glabrous, up to 1 cm long; figs clustered on up to 0.5 cm long axillary spurs, the receptacle 1.6–1.8 cm diam. when dry; waxy glands absent in the axils of the basal lateral veins. — New Guinea (Biak) . . . . . **37. F. biakensis**
b. Petioles hairy, (0.5–)1–3.5(–7) cm long; figs mostly in pairs or solitary in the leaf axils, or if on spurs, then the spurs minute (in the Philippines) or waxy glands present in the axils of the basal lateral veins and the fig receptacle 0.7–0.9 cm diam. when dry 46
46a. Periderm of leafy twig and epidermis of petiole flaking off 47
b. Periderm of leafy twig and epidermis of petiole persistent 49
47a. Figs (sub)sessile or up to 0.2 cm long pedunculate; basal bracts not deflexed; receptacle often with some lateral bracts (or displaced apical bracts). — Widespread . . . . . **63. F. lepicarpa**
b. Figs pedunculate, peduncle 0.2–1.2 cm long; receptacle without lateral bracts 48
48a. Basal bracts 2–3(–5) mm long, ± deflexed; margin of the lamina mostly (sub)-entire. — Philippines . . . . . **35. F. benguetensis**
b. Basal bracts 1–2 mm long, not deflexed; margin of the lamina crenate-dentate. — Moluccas . . . . . **96. F. ternatana**
49a. Hairs on leafy twig and lamina beneath patent. — Philippines . . . . . **42. F. carpenteriana**
b. Hairs on leafy twig and lamina beneath appressed 50
50a. Waxy glands present in the axils of the basal lateral veins; figs in clusters on spurs, the receptacle 0.7–0.9 cm diam. when dry. — New Guinea . . **46. F. cryptosyce**
b. Waxy glands absent in the axils of the basal lateral veins; figs in pairs or solitary, the receptacle 1–2 cm diam. when dry 51
51a. Stipules glabrous. — Celebes . . . . . **80. F. remifolia**
b. Stipules hairy 52
52a. Stipules 1.5–4 cm long. — Philippines . . . . . **69. F. multistipularis**
b. Stipules 0.5–1.5 cm long. — New Guinea . . . . . **38. F. boanensis**

53a. Lamina ± scabrous above 54
b. Lamina smooth above 55
54a. Periderm of leafy twig and epidermis of petiole flaking off; most leaves (sub)opposite; waxy glands usually present in the axils of the basal lateral veins beneath. — Widespread . . . . . **58. F. hispida**
b. Periderm of leafy twig and epidermis of petiole persistent; most leaves not (sub)opposite; waxy glands absent in the axils of the basal lateral veins beneath. — New Guinea . . . . . **41. F. calopilina**
55a. Lamina glabrous; tertiary venation reticulate. — Borneo . . . . . **61. F. ixoroides**
b. Lamina hairy; tertiary venation (partly) scalariform 56
56a. Periderm of leafy twig and epidermis of petiole persistent 57
b. Periderm of leafy twig and epidermis of petiole flaking off 58
57a. Cystoliths in the epidermis of the lamina above and beneath (in dry material visible as minute pustules above and as minute points or pustules beneath); fig receptacle 0.5–1.5 cm diam. when dry. — Sumatra, Malay Peninsula, Java . . . . . **81. F. ribes**
b. Cystoliths in the epidermis of the lamina only beneath (in dry material visible as minute points or pustules); fig receptacle 1.5–2 cm diam. when dry. — Moluccas . . . . . **96. F. ternatana**
58a. Figs sessile or subsessile (up to 0.2 mm long pedunculate); receptacle with lateral bracts. — Widespread . . . . . **63. F. lepicarpa**
b. Figs distinctly pedunculate; receptacle without lateral bracts 59
59a. Fig receptacle usually distinctly longer than broad; basal bracts 2–3(–5) mm long, ± reflexed. — Philippines . . . . . **35. F. benguetensis**
b. Figs mostly about as long as broad to much broader than long; basal bracts 0.5–1.5 mm long, or if longer, then not reflexed 60
60a. Lamina mostly elliptic, glabrous (or hairy on the midrib beneath), often narrowed at the base (subattenuate); fig receptacle mostly depressed-globose, 1.5–2(–2.5) cm diam. when dry. — Widespread . . . . . **88. F. septica**
b. Lamina mostly oblong, often not entirely glabrous, not narrowed at the base; fig receptacle subglobose to depressed-globose, 0.6–1.5 cm diam. when dry. — Widespread . . . . . **51. F. fistulosa**
61a. Stipules subpersistent and glabrous or only hairy at the base 62
b. Stipules caducous, or if subpersistent, then distictly hairy 64
62a. Stipules usually 1.5–2.5 cm long. — E New Guinea . . . . . **86. F. scopulifera**
b. Stipules usually 0.5–1.5 cm long 63
63a. Fig receptacle brown hairy. — Sumatra . . . . . **89. F. serraria**
b. Fig receptacle (sub)glabrous. — Sumatra, Malay Peninsula, Java . . **81. F. ribes**
64a. Petiole (1–)3–9 cm long 65
b. Petiole 0.3–2(–3) cm long 73
65a. Periderm of leafy twig and epidermis of petiole flaking off 66
b. Periderm of leafy twig and epidermis of petiole persistent 67
66a. Most leaves (sub)opposite; fig receptacle 1.5–2.5 cm diam. when dry, usually with some lateral bracts. — Widespread . . . . . **58. F. hispida**

b. Most leaves distichous; fig receptacle 0.8–1.5 cm diam. when dry, without lateral bracts. — E New Guinea . . . . . **91. F. subcongesta**
67a. Lamina (7–)13–30 cm broad; petiole (1–)3–9 cm long 68
b. Lamina 3.5–12 cm broad; petiole 1–5 cm long 71
68a. Stipules 0.8–1.2 cm long. — Sumatra, Malay Peninsula . . . . . **56. F. gilapong**
b. Stipules (1.5–)2.5–3 cm long 69
69a. Lamina scabridulous beneath or also above; leafy twigs and petioles hirtellous to strigose; fig receptacle 0.8–1.5 cm diam. when dry, basal bracts c. 2 mm long. — Sumatra . . . . . **59. F. hypogaea**
b. Lamina smooth above and beneath; leafy twigs and petioles villous to hirsute; fig receptacle 1.5–5 cm diam. when dry; basal bracts 2–12 cm long. — Borneo 70
70a. Fig receptacle with lateral bracts; basal bracts (3–)5–12 mm long; ostiole (5–)8–12 mm diam. — Borneo . . . . . **44. F. cereicarpa**
b. Fig receptacle without lateral bracts; basal bracts 2–5 mm long; ostiole 4–5 mm diam. — Borneo . . . . . **53. F. francisci**
71a. Stipules subpersistent. — Philippines . . . . . **94. F. sulcata**
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72a. Basal bracts 1–2 mm long. — Philippines . . . . . **94. F. sulcata**
b. Basal bracts 3–6 mm long. — New Guinea . . . . . **60. F. iodotricha**
73a. Lamina ± scabrous above; lateral veins often branched or furcate far from the margin (and often with small waxy glands in the furcations) 74
b. Lamina smooth above; lateral veins usually not branched or furcate far from the margin 85
74a. Periderm of leafy twig and epidermis of petiole flaking off 75
b. Periderm of leafy twig and epidermis of petiole persistent; leaves mostly distichous 76
75a. Most leaves (sub)opposite; fig receptacle 1.5–2.5 cm diam. when dry, usually with some lateral bracts. — Widespread . . . . . **58. F. hispida**
b. Most leaves distichous; fig receptacle 0.8–1.5 cm diam. when dry, without lateral bracts. — New Guinea . . . . . **91. F. subcongesta**
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b. Lamina only scabrous above 78
77a. Petiole 0.5–1.2 cm long. — Borneo . . . . . **90. F. stolonifera**
b. Petiole 1–5 cm long. — New Guinea . . . . . **60. F. iodotricha**
78a. Base of lamina deeply cordate, lobe of the broad side covering the petiole; lamina 40–100 cm long. — Borneo . . . . . **67. F. megaleia**
b. Base of lamina cuneate to deeply cordate, if deeply cordate, then the lobe at the broad side not covering the petiole; lamina 5–40 cm long 79
79a. Cystoliths in epidermis of lamina above and beneath (in dry material visible as minute pustules above and as points or minute pustules beneath) 80
b. Cystoliths in epidermis of lamina only beneath (in dry material visible as minute points or pustules) 81
80a. Fig receptacle 0.4–0.8 cm diam. when dry; basal bracts c. 1 mm long; ostiole 2.5–3 mm diam. — Sumatra . . . . . **89. F. serraria**
b. Fig receptacle 0.8–1.2 cm diam. when dry; basal bracts 2–4 mm long; ostiole 5–8 mm diam. — Sumatra, Malay Peninsula?, Java . . . . . **101. F. vrieseana**

81a. Stipules 1.5–4(–5.5) cm long; apex of lamina acuminate to (sub)caudate and (only) the acumen serrate-dentate or waxy glands present in the axils of the basal lateral veins beneath 82
b. Stipules 0.5–1.5(–2.5) cm long, apex acuminate and the whole margin denticulate, waxy glands lacking in the axils of the basal lateral veins beneath 84
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b. Stipules hairy, at least on the keel 174
174a. Fig receptacle 1.5–2 or c. 3 cm diam. when dry 175
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176a. Lamina symmetric to slightly asymmetric. — Malay Peninsula . . . . . **87. F. scortechinii**
b. Lamina distinctly to slightly asymmetric. — Moluccas (Aru Islands), New Guinea . . . . . **33. F. arfakensis**
177a. Lamina ovate. — Moluccas . . . . . **98. F. tunicata**
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b. Stipules at least partly brown hairy; peduncle 0.2–0.5 cm long, the receptacle 1.5–2.5 cm diam. when dry. — Borneo . . . . . **53. F. francisci**

REGIONAL KEY: MALAY PENINSULA

Two more taxa may occur in the Malay Peninsula which are not included in this key, see comments on *F. uncinata* and *F. vrieseana* below.

1a. Plants with figs in the leaf axils or just below the leaves 2
b. Plants cauliflorous or flagelliflorous 5
2a. Lamina distinctly hairy often scabrous above . . . . . **58. F. hispida**
b. Lamina glabrous or sparsely puberulous in the main veins, smooth above 3
3a. Fig receptacle 1.5–2 cm diam. when dry . . . . . **88. F. septica**
b. Fig receptacle 0.5–1.5 cm diam. when dry 4
4a. Figs sessile or subsessile, the receptacle mostly with lateral bracts . . . . . **63. F. lepicarpa**
b. Figs usually with 1–4 cm long peduncles, the receptacle without lateral bracts . . . . . **51. F. fistulosa**
5a. Waxy glands on the lamina at least present in the axils of the basal lateral veins, bilaterally or unilaterally 6
b. Waxy glands on the lamina absent or only present in the axils of lateral veins in the middle and/or upper part of the lamina 9
6a. Lamina asymmetric, plants flagelliflorous . . . . . **28. F. semicordata**
b. Lamina symmetric, plants cauliflorous 7
7a. Basal lateral veins up to 1/5–1/3 the length of the lamina, unbranched or faintly branched; plants monoecious . . . . . **1. F. racemosa**
b. Basal lateral veins up to 1/4–2/3 the length of the lamina, distinctly branched; plants dioecious 8
8a. Stipules 1.5–3 cm long; basal bracts (2–)4–7 cm long and ostiole (4–)6–10(–12) mm diam. . . . . **2. F. auriculata**
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b. Plants cauliflorous 11
10a. Fig receptacle with incurved lateral bracts . . . . . **34. F. beccarii**
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11a. Lamina (sub)glabrous . . . . . **51. F. fistulosa**
b. Lamina ± distinctly hairy, at least beneath 12
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13a. Lamina smooth above; epidermis of fig receptacle and peduncle flaking off . . . . . **85. F. schwarzii**
b. Lamina usually scabrous to scabridulous above and the epidermis of fig receptacle and peduncle not flaking off 14
14a. Epidermis of petiole persistent . . . . . **56. F. gilapong**
b. Epidermis of petiole flaking off 15

15a. Fig receptacle 2.5–3 cm diam. when dry, the ostiole 6–8 mm diam. . . . . **73. F. obpyramidata**
b. Fig receptacle 1.5–2.5 cm. diam when dry, the ostiole 3–4 mm diam. . . . . **58. F. hispida**

REGIONAL KEY: SUMATRA

1a. Waxy glands on the lamina at least present in the axils of the basal lateral veins . 2
b. Waxy glands on the lamina absent or only present in the axils of lateral veins in the middle and/or upper part of the lamina 4
2a. Plants flagelliflorous; lateral veins 10–12 pairs . . . . . **59. F. hypogaea**
b. Plants cauliflorous; lateral veins usually 4–9 pairs 3
3a. Basal lateral veins up to 1/5–1/3 the length of the lamina, unbranched or faintly branched; plants monoecious . . . . . **1. F. racemosa**
b. Basal lateral veins up to 1/4–2/3 the length of the lamina, distinctly branched; plants dioecious . . . . . **6. F. variegata**
4a. Plants with figs in the leaf axils 5
b. Plants cauliflorous or flagelliflorous 8
5a. Lamina distinctly hairy, often scabrous above . . . . . **58. F. hispida**
b. Lamina glabrous or sparsely puberulous in the main veins, smooth above 6
6a. Fig receptacle 1.5–2 cm diam. when dry . . . . . **88. F. septica**
b. Fig receptacle 0.5–1.5 cm diam. when dry 7
7a. Figs sessile or subsessile, the receptacle mostly with lateral bracts . . . . . **63. F. lepicarpa**
b. Figs usually with 1–4 cm long peduncles, the receptacle without lateral bracts . . . . . **51. F. fistulosa**
8a. Plants flagelliflorous 9
b. Plants cauliflorous 15
9a. Leafy twigs and lamina (sub)glabrous . . . . . **82. F. rubrosyce**
b. Leafy twigs and lamina distinctly hairy 10
10a. Figs with curved lateral bracts . . . . . **99. F. uncinata**
b. Figs without lateral bracts or few flat lateral bracts 11
11a. Epidermis of petiole flaking off; many of the leaves subopposite **58. F. hispida**
b. Epidermis of petiole persistent; some or none of the leaves subopposite 12
12a. Petiole usually 3–9 cm long; stipules usually 2.5–3 cm long **59. F. hypogaea**
b. Petiole usually 0.5–2 cm long; stipules usually 0.5–1.5 cm long 13
13a. Basal bracts 2–4 mm long, patent to ± deflexed; ostiole 5–8 mm diameter . . . . . **101. F. vrieseana**
b. Basal bracts 1–2 mm long, not patent or deflexed; ostiole 2–3 mm diameter . 15
14a. Indumentum of leafy twig and petiole (mostly) patent, the longer brown hairs intermixed with shorter white ones; fig receptacle brown hairy . **89. F. serraria**
b. Indumentum of leafy twig and petiole (mostly) appressed, the longer brown hairs not intermixed with shorter white ones; fig receptacle (sub)glabrous **81. F. ribes**
15a. Lamina (sub)glabrous . . . . . **51. F. fistulosa**
b. Lamina ± distinctly hairy, at least beneath 16

16a. Lamina smooth above; epidermis of fig receptacle and peduncle flaking off . . . . . **85. F. schwarzii**
b. Lamina usually scabrous to scabridulous above and the epidermis of fig receptacle and peduncle not flaking off 17
17a. Epidermis of petiole persistent 18
b. Epidermis of petiole flaking off 20
18a. Fig receptacle 1.5–2.8 cm diam. when dry, with some lateral bracts; apex of lamina acute to subacuminate . . . . . **56. F. gilapong**
b. Fig receptacle 0.8–1.2 cm diam when dry, without lateral bracts 19
19a. Indumentum of leafy twig and petiole (mostly) patent, the longer brown hairs intermixed with shorter white ones; fig receptacle brown hairy . **89. F. serraria**
b. Indumentum of leafy twig and petiole (mostly) appressed, the longer brown hairs not intermixed with shorter white ones; fig receptacle (sub)glabrous **81. F. ribes**
20a. Most of the leaves subopposite; lamina mostly ± scabrous above; fig receptacle usually more than 1.5 cm diam. when dry . . . . . **58. F. hispida**
b. Some of the leaves subopposite; lamina usually smooth above; fig receptacle usually up to 1.5 cm diam. when dry . . . . . **50. F. dimorpha**

REGIONAL KEY: JAVA

Ficus geocarpa might occur in Java; it is not included in the key.

1a. Waxy glands on the lamina at least present in the axils of the basal lateral veins . 2
b. Waxy glands on the lamina absent or only present in the axils of lateral veins in the middle and/or upper part of the lamina 3
2a. Basal lateral veins up to 1/5–1/3 the length of the lamina, unbranched or faintly branched; plants monoecious . . . . . **1. F. racemosa**
b. Basal lateral veins up to 1/4–2/3 the length of the lamina, distinctly branched; plants dioecious . . . . . **6. F. variegata**
3a. Plants with figs in the leaf axils 4
b. Plants cauliflorous or flagelliflorous 7
4a. Lamina distinctly hairy often scabrous above . . . . . **58. F. hispida**
b. Lamina glabrous or sparsely puberulous in the main veins, smooth above 5
5a. Fig receptacle 1.5–2 cm diam. when dry . . . . . **88. F. septica**
b. Fig receptacle 0.5–1.5 cm diam. when dry 6
6a. Figs sessile or subsessile, the receptacle mostly with lateral bracts . . . . . **63. F. lepicarpa**
b. Figs usually with 1–4 cm long peduncles, the receptacle without lateral bracts . . . . . **51. F. fistulosa**
7a. Plants flagelliflorous 8
b. Plants cauliflorous 10
8a. Epidermis of petiole flaking off; fig receptacle 1.5–2.5 cm diam. when dry . . . . . **58. F. hispida**
b. Epidermis of petiole persistent; fig receptacle 0.5–1.5 cm diam. when dry . . . 9
9a. Basal bracts 2–4 mm long, patent to ± deflexed; ostiole 5–8 mm diam.; tertiary venation scalariform with more than 2 parallel intercostals . . **101. F. vrieseana**

b. Basal bracts 1–2 mm long, not patent or deflexed; ostiole 2–3 mm diam.; tertiary venation reticulate or with at most 2 parallel intercostals . . . . . **81. F. ribes**
10a. Lamina (sub)glabrous . . . . . **51. F. fistulosa**
b. Lamina ± distinctly hairy, at least beneath 11
11a. Epidermis of petiole flaking off; fig receptacle 1.5–2.5 cm diam. when dry . . . . . **58. F. hispida**
b. Epidermis of petiole persistent; fig receptacle 0.5–1.5 cm diam. when dry . . . . . **81. F. ribes**

REGIONAL KEY: LESSER SUNDA ISLANDS

1a. Waxy glands on the lamina at least present in the axils of the basal lateral veins . 2
b. Waxy glands on the lamina absent or only present in the axils of lateral veins in the middle and/or upper part of the lamina 3
2a. Basal lateral veins up to 1/5–1/3 the length of the lamina, unbranched or faintly branched; plants monoecious . . . . . **1. F. racemosa**
b. Basal lateral veins up to 1/4–2/3 the length of the lamina, distinctly branched; plants dioecious . . . . . **6. F. variegata**
3a. Lamina distinctly hairy and often scabrous above . . . . . **58. F. hispida**
b. Lamina glabrous or sparsely hairy, smooth above 4
4a Plants cauliflorous . . . . . **51. F. fistulosa**
b. Plants with figs in the leaf axils 5
5a. Fig receptacle 1.5–2 cm diam. when dry . . . . . **88. F. septica**
b. Fig receptacle 0.5–1.5 cm diam. when dry 6
6a. Figs sessile or subsessile, the receptacle mostly with lateral bracts . . . . . **63. F. lepicarpa**
b. Figs usually with 1–4 cm long peduncles, the receptacle without lateral bracts . . . . . **51. F. fistulosa**

REGIONAL KEY: BORNEO

1a. Waxy glands present at least in the axils of both basal lateral veins beneath . . 2
b. Waxy glands absent or if present then in the axils of the lateral veins in the middle or upper part of the lamina or sometimes also in furcations of lateral veins or also in the axils of one of the basal lateral veins 6
2a. Plants cauliflorous, the figs cauliflorous in globose heads, the receptacle 0.4–0.6 cm diam. when dry . . . . . **23. F. minahassae**
b. Plants cauliflorous, the figs cauliflorous not in heads, the receptacle 1.5–5 cm diam. when dry 3
3a. Leafy twigs white appressed-puberulous or glabrous; lateral veins mostly 4–9 pairs 4
b. Leafy twigs brown to white villous to subhirsute; lateral veins mostly 10–18 pairs 5
4a. Basal lateral veins up to 1/5–1/3 the length of the lamina, unbranched or faintly branched; plants monoecious . . . . . **1. F. racemosa**

b. Basal lateral veins up to 1/4–2/3 the length of the lamina, distinctly branched; plants dioecious . . . . . **6. F. variegata**
5a. Peduncle 0.5–1(–4) cm long; fig receptacle mostly with lateral bracts; stipules usually 2.5–5 cm long . . . . . **44. F. cereicarpa**
b. Peduncle 0.2–0.5 cm long; fig receptacle without lateral bracts; stipules 1.5–2.5 cm long . . . . . **53. F. francisci**
6a. Shrub up to 1 m tall with stolon-like stems and dark brown to blackish strigose leafy twigs . . . . . **102. F. macrostyla**
b. Trees or treelets, or if small shrubs, then not with stolon-like stems and the leafy twigs not dark brown to blackish strigose 7
7a. Plants with figs in the leaf axils 8
b. Plants cauliflorous or flagelliflorous 12
8a. Lamina distinctly hairy often scabrous above . . . . . **58. F. hispida**
b. Lamina glabrous or sparsely puberulous in the main veins, smooth above 9
9a. Fig receptacle 1.5–2 cm diam. when dry . . . . . **88. F. septica**
b. Fig receptacle 0.5–1.5 cm diam. when dry 10
10a. Figs sessile or subsessile (with a peduncle up to 0.2 cm long), the receptacle mostly with lateral bracts . . . . . **63. F. lepicarpa**
b. Figs usually with 0.2–4 cm long peduncles, the receptacle without lateral bracts 11
11a. Peduncle 0.2–0.4 cm long; tertiary venation reticulate . . . . . **61. F. ixoroides**
b. Peduncle usually 1–4 cm long; tertiary venation scalariform to subreticulate . . . . . **51. F. fistulosa**
12a. Plants flagelliflorous 13
b. Plants cauliflorous 22
13a. Base of lamina deeply cordate, lobe of the broad side covering the petiole; lamina 40–100 cm long . . . . . **67. F. megaleia**
b. Base of lamina cuneate to deeply cordate, or if deeply cordate, then the lobe at the broad side not covering the petiole; lamina 5–40(–45) cm long 14
14a. Epidermis of petiole flaking off; most of the leaves (sub)opposite **58. F. hispida**
b. Epidermis of petiole persistent; some of the leaves (sub)opposite 15
15a. Stipules subpersistent 16
b. Stipules caducous 19
16a. Margin of lamina entire (or faintly dentate); lateral veins not branched or furcate 17
b. Margin of lamina distinctly dentate to denticulate; lateral veins of the broad side of the lamina often branched or furcate far from the margin 18
17a. Apex of lamina caudata with the acumen filiform; stipules 2–4 cm long . . . . . **34. F. beccarii**
b. Apex of lamina (sub)acuminate to acute; stipules 1–2 cm long . . . . . **95. F. tarennifolia**
18a. Fig receptacle c. 1–1.5 cm diam. when dry, with 1 or 2 lateral bracts . . . . . **97. F. treubii**
b. Fig receptacle c. 1.5–3 cm diam. when dry, with numerous curved lateral bracts . . . . . **99. F. uncinata**

19a. Fig receptacle c. 1.5–3 cm diam. when dry; lamina often strongly symmetric at the base . . . . . **99. F. uncinata**
b. Fig receptacle 0.8–1.6 cm diam. when dry; lamina slightly or not asymmetric at the base 20
20a. Leafy twigs brown hirsute to hirtellous to strig(ill)ose; margin of the lamina dentate . . . . . **90. F. stolonifera**
b. Leafy twigs white appressed-puberulous to glabrous; margin of the lamina (sub)entire 21
21a. Fig receptacle without lateral bracts; peduncle 0.5–1.2 cm long; basal bracts 1–2 mm long . . . . . **95. F. tarennifolia**
b. Fig receptacle with several lateral bracts; peduncle 0.1–0.3 cm long; basal bracts 2–5 mm long . . . . . **93. F. subterranea**
22a. Epidermis of petiole flaking off 23
b. Epidermis of petiole persistent 28
23a. Leafy twig and lower surface of lamina glabrous or sparsely white appressed-puberulous; fig receptacle 0.5–1.5 cm diam. when dry 24
b. Leafy twig and often also the lower surface of the lamina distinctly hairy, or if subglabrous then the fig receptacle 2–4.5 cm diam. when dry 25
24a. Peduncle 0.2–0.4 cm long; tertiary venation reticulate . . . . . **61. F. ixoroides**
b. Peduncle usually 1–4 cm long; tertiary venation scalariform to subreticulate . . . . . **51. F. fistulosa**
25a. Epidermis of fig receptacle flaking off . . . . . **85. F. schwarzii**
b. Epidermis of fig receptacle persistent 26
26a. Base of lamina cordate to subcordate at one side cordate to rounded at the other . . . . . **71. F. nota**
b. Base of lamina cuneate to subcordate at one side and cuneate to rounded at the other side 27
27a. Ostiole 2–4 mm diam.; most leaves subopposite; lamina usually ± scabrous above . . . . . **58. F. hispida**
b. Ostiole 5–10 mm diam.; some leaves subopposite; lamina smooth above . . . . . **83. F. satterthwaitei**
28a. Petiole (1.5–)2–7 cm long 29
b. Petiole 0.3–2 cm long 30
29a. Leafy twigs brown strigillose; stipules 0.8–1.5 cm long . . . . **100. F. virescens**
b. Leafy twigs whitish to brownish villose to sericeous; stipules 2–2.5 cm long . . . . . **32. F. albomaculata**
30a. Fig receptacle with numerous curved lateral bracts . . . . . **55. F. geocharis**
b. Fig receptacle without or with 1 or 2 flat lateral bracts 31
31a. Fig receptacle 1.2–2.5 cm diam. when dry, peduncle 0.8–1.2 cm long . . . . . **64. F. limosa**
b. Fig receptacle 0.6–1.2 cm diam. when dry, peduncle 0–0.8 cm long 32
32a. Stipules glabrous; apex of lamina (sub)acuminate to acute; fig receptacle without lateral bracts . . . . . **95. F. tarennifolia**
b. Stipules sericeous in the keel; apex of lamina (sub)caudate; fig receptacle usually with 1 or 2 lateral bracts . . . . . **97. F. treubii**

REGIONAL KEY: PHILIPPINES

1a. Waxy glands present at least in the axils of the basal lateral veins beneath . . . 2
b. Waxy glands absent or if present then in the axils of the lateral veins in the middle or upper part of the lamina (or sometimes also in furcations of lateral veins) . 7
2a. Plants with figs in the leaf axils . . . 3
b. Plants cauliflorous . . . 4
3a. Tree; lamina sagittate-subpandurate, 25–80 cm long . . . . **26. F. pseudopalmas**
b. Shrub; lamina linear-lanceolate, 9–24 cm long . . . **27. F. rivularis**
4a. Figs in globose heads, the receptacle 0.4–0.6 cm diam. when dry . . . **23. F. minahassae**
b. Figs not in heads, the receptacle 1–5 cm diam. when dry . . . 5
5a. Leafy twigs glabrous or sparsely white appressed-puberulous . . **6. F. variegata**
b. Leafy twigs densely brown hirtellous or hirsute . . . 6
6a. Fig receptacle 3.5–5 cm diam. when dry, petiole 2–8(–11) cm long . . . **43. F. cassidyana**
b. Fig receptacle 1–2.5 cm diam when dry; petiole 0–2(–2.5) cm long . . . **39. F. botryocarpa**
7a. Plants with figs in the leaf axils . . . 8
b. Plants cauliflorous or flagelliflorous . . . 14
8a. Figs sessile or subsessile (with a peduncle up to 0.2 cm long) . . . 9
b. Figs with a peduncle of 0.2–4(–6) cm long . . . 11
9a. Figs with lateral bracts; epidermis of petiole ± flaking off; stipules often caducous . . . **63. F. lepicarpa**
b. Figs without lateral bracts; epidermis of petiole persistent; stipules (sub)persistent . . . 10
10a. Base of lamina subcordate-auriculate . . . **69. F. multistipularis**
b. Base of lamina cuneate to rounded to subcordate . . . **42. F. carpenteriana**
11a. Leafy twigs glabrous or sparsely white appressed puberulous . . . 12
b. Leafy twigs ± densely brown to whitish hirtellous to subhirsute to strig(ill)ose . . . 13
12a. Fig receptacle 1.5–2 cm diam. when dry . . . **88. F. septica**
b. Fig receptacle 0.5–1.5 cm diam. when dry . . . **51. F. fistulosa**
13a. Epidermis of petiole flaking off; stipules usually caducous **35. F. benguetensis**
b. Epidermis of petiole persistent; stipules (sub)persistent . . **42. F. carpenteriana**
14a. Plants flagelliflorous . . . 15
b. Plants cauliflorous . . . 17
15a. Stipules subpersistent; fig receptacle 1–1.3 cm diam. when dry . . **94. F. sulcata**
b. Stipules caducous; fig receptacle 0.4–1 cm diam. when dry . . . 16
16a. Fig receptacle brown appressed- to patent-puberulous . . . . . **65. F. linearifolia**
b. Fig receptacle whitish appressed-puberulous . . . . . **47. F. cuneata**
17a. Epidermis of petiole persistent . . . 18
b. Epidermis of petiole flaking off . . . 20
18a. Fig receptacle 0.5–1 cm diam. when dry . . . . . **65. F. linearifolia**
b. Fig receptacle 1–2.5 cm diam. when dry . . . 19

19a. Stipules usually caducous; peduncle 0.4–2.5 cm, usually longer than 0.7 cm . . . . . **39. F. botryocarpa**
b. Stipules persistent; peduncle 0–0.7 cm long . . . . . **42. F. carpenteriana**
20a. Leafy twigs and lamina (sub)glabrous . . . . . **51. F. fistulosa**
b. Leafy twigs and lower surface of lamina ± distinctly hairy 21
21a. Fig receptacle 0.4–1 cm diam. when dry 22
b. Fig receptacle 1–4.5 cm diam. when dry 23
22a. Fig receptacle brown appressed- to patent-puberulous . . . . . **65. F. linearifolia**
b. Fig receptacle whitish appressed-puberulous . . . . . **47. F. cuneata**
23a. Ostiole c. 2 mm diam.; lateral veins rarely branched or furcate far from the margin . . . . . **35. F. benguetensis**
b. Ostiole 4–10 mm diam.; lateral veins often branched or furcate far from the margin 24
24a. Base of lamina cordate to subcordate at one side and cordate to rounded at the other . . . . . **71. F. nota**
b. Base of lamina cuneate to subcordate at one side and cuneate to rounded at the other side . . . . . **83. F. satterthwaitei**

REGIONAL KEY: CELEBES

1a. Leafy twigs and petioles setose with irritating hairs; stipules 3–7 cm long; fig receptacle 0.4–0.8 cm diam. when dry; figs clustered . . . . . **24. F. pungens**
b. Leafy twigs and petioles without irritating hairs; stipules up to 3 cm long, or if up to 4.5 cm long, then the fig receptacle (1–)1.5–2.5(–3) cm diam. when dry or the figs in globose heads 2
2a. Waxy glands present at least in the axils of the basal lateral veins beneath . . . 3
b. Waxy glands absent or if present then in the axils of the lateral veins in the middle or upper part of the lamina (or sometimes also in furcations of lateral veins) 12
3a. Plants with figs in the leaf axils 4
b. Plants cauliflorous, flagelliflorous, or ramiflorous 7
4a. Lamina smooth above, the margin entire . . . . . **7. F. adenosperma**
b. Lamina ± scabrous above, the margin dentate or denticulate 5
5a. Lamina pandurate . . . . . **49. F. decipiens**
b. Lamina not more or less distinctly constricted below the middle 6
6a. Lamina elliptic to obovate (or oblong to subobovate); tertiary venation scalariform; fig receptacle (usually) with some lateral bracts . . . . . **40. F. calcarata**
b. Lamina oblong to lanceolate; tertiary venation reticulate; fig receptacle without lateral bracts . . . . . **62. F. latimarginata**
7a. Plants flagelliflorous; waxy glands unilaterally, in the axil of the basal lateral vein at the broad side of the lamina . . . . . **54. F. geocarpa**
b. Plants cauliflorous or ramiflorous 8
8a. Figs in globose heads, the receptacle 0.4–0.6 cm diam. when dry . . . . . **23. F. minahassae**
b. Figs not in heads, the receptacle (0.4–)0.6–5 cm diam. when dry 9

9a. Figs on up to 1 cm long spurs, the receptacle 0.4–1.2 cm diam. when dry . . . . . **7. F. adenosperma**
b. Figs on up to on woody tubercles or up to 25 cm or 1 m long leafless branchlets, the receptacle (1–)1.5–5 cm diam. when dry 10
10a. Leafy twigs brown hirtellous to strigose; fig-bearing branchlets up to 1 m long . . . . . **39. F. botryocarpa**
b. Leafy twigs white appressed-puberulous to glabrous; fig-bearing tubercles or branchlets up to 25 cm long 11
11a. Basal lateral veins up to 1/5–1/3 the length of the lamina, unbranched or faintly branched; plants monoecious . . . . . **1. F. racemosa**
b. Basal lateral veins up to 1/4–2/3 the length of the lamina, distinctly branched; plants dioecious . . . . . **6. F. variegata**
12a. Plants with figs in the leaf axils 13
b. Plants cauliflorous, flagelliflorous, or ramiflorous 18
13a. Figs sessile or subsessile (with a peduncle up to 0.2 mm long) 14
b. Figs pedunculate 16
14a. Epidermis of petiole persistent; fig receptacle without lateral bracts; lamina smooth above . . . . . **80. F. remifolia**
b. Epidermis of petiole flaking off; fig receptacle usually with lateral bracts . . . 15
15a. Ostiole 4–6 mm diam., surrounded by 2 or 3 rows of apical bracts; internodes of leafy twigs hollow . . . . . **63. F. lepicarpa**
b. Ostiole 1.5–2.5 mm diam., not surrounded by apical bracts; internodes of leafy twigs solid . . . . . **13. F. erythrosperma**
16a. Lamina distinctly hairy often scabrous above . . . . . **58. F. hispida**
b. Lamina glabrous or sparsely puberulous in the main veins, smooth above . . . 17
17a. Fig receptacle 1.5–2 cm diam. when dry . . . . . **88. F. septica**
b. Fig receptacle 0.5–1.5 cm diam. when dry . . . . . **51. F. fistulosa**
18a. Plants flagelliflorous 19
b. Plants cauliflorous or ramiflorous 20
19a. Epidermis of petiole persistent, the petiole up to 2(–3) cm long; none of the leaves (sub)opposite . . . . . **54. F. geocarpa**
b. Epidermis of petiole flaking off, the petiole up to 10(–14) cm long; most leaves (sub)opposite . . . . . **58. F. hispida**
20a. Leafy twigs and lower surface of lamina glabrous or sparsely white appressed-puberulous . . . . . **51. F. fistulosa**
b. Leafy twigs and lower surface of lamina distinctly hairs, often brownish . . . 21
21a. Epidermis of petiole persistent 22
b. Epidermis of petiole flaking off 23
22a. Fig receptacle 0.5–1.2 cm diam. when dry, the peduncle 0.1–0.4 cm long, and the ostiole 2–2.5 mm diam. . . . . **76. F. parvibracteata**
b. Fig receptacle (1–)1.2–2.5 cm diam. when dry, the peduncle 0.4–2.5 cm long, and the ostiole 2.5–4 mm diam. . . . . **39. F. botryocarpa**
23a. Fig receptacle 0.4–1.2 cm diam. when dry; lamina with entire margin and smooth above; none of the leaves (sub)opposite . . . . . **13. F. erythrosperma**

b. Fig receptacle usually 1.2–3 cm diam. when dry; lamina with entire margin and/or scabrous above; some or most of the leaves (sub)opposite 24
24a. Stipules 0.5–1 cm long; petiole up to 2(–2.5) cm long; lamina smooth above . . . . . **45. F. congesta**
b. Stipules 1–2.5 cm long; petiole up to 10(–14) cm long; lamina mostly scabrous above . . . . . **58. F. hispida**

REGIONAL KEY: MOLUCCAS

1a. Leafy twigs and petioles setose with irritating hairs; stipules 3–7 cm long; fig receptacle 0.4–0.8 cm diam. when dry . . . . . **24. F. pungens**
b. Leafy twigs and petioles without irritating hairs; stipules up to 3 cm long, or if up to 4.5 cm long, then the fig receptacle (1–)1.5–2.5(–3) cm diam. when dry . . 2
2a. Waxy glands in the axils of the basal lateral veins, usually bilaterally, sometimes laterally; margin of the lamina usually (sub)entire; upper surface of lamina smooth; leaves spirally arranged (to subdistichous), or if distichous or subdistichous to sub(sub)-opposite, then the lamina scabrous above and/or the margin dentate 3
b. Waxy glands absent or in the axils of the lateral veins in the middle or upper part of the lamina; margin of the lamina usually dentate; upper surface of lamina often scabrous; leaves mostly subdistichous to (sub)opposite or spirally arranged to (sub)opposite 15
3a. Leaves distichous or subdistichous to (sub)opposite and lamina scabrous above and/or the margin dentate; petiole 0.5–2 cm long 4
b. Leaves spirally arranged (to subdistichous); lamina smooth above; margin (sub)entire, or if dentate, then the petiole 2–10 cm long 5
4a. Plants with figs in the leaf axils . . . . . **22. F. umbonata**
b. Plants cauliflorous . . . . . **39. F. botryocarpa**
5a. Lamina chartaceous, scabrous above, and the margin dentate; stipules subpersistent . . . . . **40. F. calcarata**
b. Lamina coriaceous, smooth above, and the margin usually entire; stipules mostly caducous 6
6a. Trees without *Terminalia*-branching, cauliflorous, with the figs on up to 60 cm long leafless branchlets or on woody tubercles 7
b. Trees with *Terminalia*-branching (with ± clear differences in length between first and later formed internodes), with figs axillary or just below the leaves, or if cauliflorous than on up to 2 cm long spurs 9
7a. Basal lateral veins up to 1/5–1/3 the length of the lamina, unbranched or faintly branched; plants monoecious . . . . . **1. F. racemosa**
b. Basal lateral veins up to 1/4–2/3(–4/5) the length of the lamina, distinctly branched; plants dioecious 8
8a. Stipules 1.5–2.5(–3) cm long; figs on up to 60 cm long branchlets, 0.5–1.5 cm long pedunculate . . . . . **3. F. nodosa**
b. Stipules 0.5–1.2(–2) cm long: figs on up to 7 cm long branchlets or on woody tubercles . . . . . **6. F. variegata**
9a. Midrib of lamina hairy above; basal bracts caducous . . . . . **19. F. subcuneata**

b. Midrib of lamina (becoming) glabrous above; basal bracts persistent 10
10a. Shrub with the leaves conspicuously tufted; leafy twig and lamina (sub)-glabrous . . . . . **8. F. arbuscula**
b. Tree, if a shrub, then the leafy twigs and lamina distinctly hairy 11
11a. Lamina above and beneath minutely pustulate (by cystoliths); figs often on spurs on the older wood . . . . . **7. F. adenosperma**
b. Lamina only beneath minutely pustulate (by cystoliths): figs axillary or just below the leaves, rarely ramiflorous or cauliflorous 12
12a. Leafy twigs, lamina and stipules glabrous or at most appressed-puberulous . 13
b. Leafy twigs, lamina and often also the stipules conspicuously hairy 14
13a. Stipules 2–4.5 cm long . . . . . **9. F. austrina**
b. Stipules 1–2 cm long . . . . . **10. F. casearioides**
14a. Lamina with appressed hairs on the veins beneath; base of lamina cuneate to obtuse; fig receptacle 0.4–1.2 cm diam. when dry . . . . . **13. F. erythrosperma**
b. Lamina with patent hairs on the veins beneath; base of lamina obtuse to (sub)-cordate; fig receptacle 1.8–3 cm diam. when dry . . . . . **14. F. funiculosa**
15a. Plants with figs in the leaf axils or just below the leaves 16
b. Plants cauliflorous or flagelliflorous 21
16a. Figs sessile 17
b. Figs pedunculate, the peduncle at least 0.2 cm long 19
17a. Fig receptacle c. 3 cm diam. when dry, without lateral bracts; epidermis of petiole persistent . . . . . **66. F. manuselensis**
b. Fig receptacle 0.4–1.5 cm diam. when dry, with lateral bracts; epidermis of petiole ± flaking off 18
18a. Stipules whitish to brownish appressed-puberulous to glabrous; ostiole 4–6 mm diam. . . . . **63. F. lepicarpa**
b. Stipules brown subvillous to subsericeous: ostiole 1.5–2.5 mm diam. . . . . **13. F. erythrosperma**
19a. Leafy twigs and leaves (sub)glabrous . . . . . **88. F. septica**
b. Leafy twigs and/or lamina beneath distinctly hairy 20
20a. Peduncle 0.2–0.6 cm long, fig receptacle without lateral bracts; lamina smooth above; petiole up to 0.2 cm long . . . . . **96. F. ternatana**
b. Peduncle 0.5–1.5(–3) cm long; fig receptacle usually with some lateral bracts; lamina often scabrous above; petiole up to 10(–14) cm long . . . **58. F. hispida**
21a. Figs flagelliflorous 22
b. Figs cauliflorous or ramiflorous 24
22a. Fig receptacle 1.5–2.5 cm diam. when dry, mostly with some lateral bracts; petiole 1–10(–14) cm long; lamina often scabrous above . . . . . **58. F. hispida**
b. Fig receptacle 0.7–1.3 cm diam. when dry, without lateral bracts; petiole usually up to 1.2 cm long; lamina smooth above 23
23a. Petiole 0.3–0.5 cm long, the epidermis persistent . . . . . **77. F. pleyteana**
b. Petiole 0.4–1.5 cm long, the epidermis flaking off . . . . . **33. F. arfakensis**
24a. Figs ramiflorous, up to 6 together on 0.3 cm long spurs . .**13. F. erythrosperma**
b. Figs cauliflorous on well-developed fig-bearing leafless branches, at least 5 cm long 25

25a. Figs sessile, the receptacle c. 3 cm diam. when dry . . . . . **66. F. manuselensis**
b. Figs pedunculate, the peduncle at least 0.2 cm long, the receptacle 0.7–2.3 cm diam. when dry 26
26a. Peduncle 0.2–0.4 cm long and the lamina ± scabrous above and beneath . . . . . **98. F. tunicata**
b. Peduncle 0.4–2.5(–3.5) cm long, or if 0.2–0.4 cm long, then the lamina smooth above and beneath 27
27a. Epidermis of petiole persistent 28
b. Epidermis of petiole flaking off 29
28a. Stipules usually 0.6–1 cm long; periderm flaking off below the leaves, there also often conical 'buds' . . . . . **96. F. ternatana**
b. Stipules usually 1–2.5 cm long: periderm persistent and conical 'buds' absent . . . . . **39. F. botryocarpa**
29a. Fig receptacle 1.5–2.5 cm diam. when dry, mostly with some lateral bracts; lamina often scabrous above . . . . . **58. F. hispida**
b. Fig receptacle 0.7–1.3 cm diam. when dry, without lateral bracts; lamina smooth above . . . . . **33. F. arfakensis**

REGIONAL KEY: NEW GUINEA

1a. Waxy glands on the lamina at least present in the axils of the basal lateral veins, usually bilaterally, sometimes unilaterally 2
b. Waxy glands on the lamina absent or only present in the axils of lateral veins in the middle and/or upper part of the lamina 30
2a. Shrub up to 1 m tall; stipules 1.5–3.5 cm long . . . . . **46. F. cryptosyce**
b. Tree or shrub taller than 1 m, or if up to 1 m tall, then the stipules 0.5–1.5 cm long 3
3a. Leaves distichous 4
b. Leaves spirally arranged 5
4a. Lamina scabrous above . . . . . **22. F. umbonata**
b. Lamina smooth above . . . . . **12. F. endochaete**
5a. Stipules 10–30 cm long . . . . . **25. F. dammaropsis**
b. Stipules up to 7 cm long 6
6a. Leafy twigs and petioles setose with irritating hairs; stipules 3–7 cm long; fig receptacle 0.4–0.8 cm diam. when dry . . . . . **24. F. pungens**
b. Leafy twigs and petioles without irritating hairs; stipules usually up to 3 cm long, or if up to 6 cm long, then the fig receptacle 1–3 cm diam. when dry 7
7a. Lamina asymmetric; leaves (sub)opposite to subdistichous **39. F. botryocarpa**
b. Lamina (almost) symmetric; leaves spirally arranged (or to subdistichous) . . . 8
8a. Basal lateral veins distinct, running up to at least 1/5 the length of the lamina or with numerous large lateral bracts; fig receptacle without internal hairs; trees without *Terminalia*-branching 9
b. Basal lateral veins hardly or not distinct; fig receptacle mostly with internal hairs; trees with *Terminalia*- branching (the proximal internodes of branches much longer the distal ones 17

9a. Lamina ± scabrous above 10
b. Lamina smooth above 11
10a. Fig receptacle without lateral bracts; stipules up to 3 cm long; lateral veins 6–8 pairs . . . . . **4. F. robusta**
b. Fig receptacle with numerous lateral bracts; stipules up to 6 cm long; lateral veins 7–12 pairs . . . . . **79. F. praestans**
11a. Lamina ± densely hairy beneath, also on the smaller veins; stipules hairy . . . 12
b. Lamina glabrous or ± sparsely (minutely) puberulous on the main veins beneath; stipules glabrous or hairy 13
12a. Stipules brownish (sub)sericeous, 0.8–1.5 cm long; lamina beneath densely tomentose on the veins; small nodal waxy glands absent . . . . . **5. F. semivestita**
b. Stipules whitish (to yellowish) (sub)sericeous, mostly 1.5–2.5 cm long; lamina beneath sparsely to rather densely puberulous on the veins or glabrous . . . . . **3. F. nodosa**
13a. Basal lateral veins unbranched (or faintly branched); margin of lamina (sub)entire; plants monoecious (styles in the same fig different in length) 14
b. Basal lateral veins branched or; plants dioecious (styles in the same fig of equal length) 16
14a. Stipules hairy outside, densely to sparsely, or at least with the margin ciliolate, often subpersistent; ostiole c. 3 mm diam. . . . . **1. F. racemosa**
b. Stipules entirely glabrous; ostiole 4–6 mm diam. 15
15a. Basal lateral veins up to 1/6–1/4 the length of the lamina; peduncle 1.5–3.5 cm long . . . . . **29. F. itoana**
b. Basal lateral veins 1/4–1/3(–1/2) the length of the lamina; peduncle 0.3–1.5 cm long . . . . . **30. F. microdictya**
16a. Stipules white (to yellowish) (sub)sericeous, usually 1.5–2.5 cm long; usually with small nodal waxy glands . . . . . **3. F. nodosa**
b. Stipules glabrous or, if hairy, then yellowish and often only at the base and/or the apex; nodal waxy glands absent . . . . . **6. F. variegata**
17a. Stipules (1–)1.5–6 cm long, coriaceous, persistent; lamina 25–50 cm long . . 18
b. Stipules 0.5–3 cm long, usually caducous, sometimes subpersistent; lamina shorter than 25 cm 19
18a. Lamina distinctly puberulous to hirtellous in the main veins beneath . . . . . **15. F. megalophylla**
b. Lamina subglabrous beneath, only with minute brown pluricellular trichomes . . . . . **18. F. saccata**
19a. Midrib of lamina hairy above; basal bracts caducous 20
b. Midrib of lamina (becoming) glabrous above; basal bracts persistent 21
20a. Shrub; fig receptacle c. 0.8 cm diam. when dry . . . . . **20. F. suffruticosa**
b. Tree; fig receptacle 1.8–2.5(–3) cm diam. when dry . . . . . **19. F. subcuneata**
21a. Shrub with the leaves conspicuously tufted; leafy twig and lamina (sub)-glabrous . . . . . **8. F. arbuscula**
b. Tree, if a shrub, then the leafy twigs and lamina distinctly hairy 22
22a. Lamina above and beneath minutely pustulate (by cystoliths) 23
b. Lamina only beneath minutely pustulate (by cystoliths) 25

23a. Tertiary venation of lamina reticulate or at most subscalariform with at most 4 (rarely 5) intercostals . . . . . **7. F. adenosperma**
b. Tertiary venation of lamina distinctly scalariform with at least 6 intercostals 24
24a. Leafy twigs glabrous; apex of lamina abruptly acuminate . . . . . **11. F. comitis**
b. Leafy twigs hairy; apex of lamina gradually acuminate . . . . . **16. F. mollior**
25a. Leafy twigs, lamina and stipules glabrous or at most appressed-puberulous . 26
b. Leafy twigs, lamina and often also the stipules conspicuously hairy 27
26a. Stipules 2–4.5 cm long . . . . . **9. F. austrina**
b. Stipules 1–2 cm long . . . . . **10. F. casearioides**
27a. Midrib of lamina beneath with appressed hairs of about equal length; indumentum of lamina beneath usually confined to the midrib and lateral veins; base of lamina cuneate to obtuse . . . . . **13. F. erythrosperma**
b. Midrib of lamina beneath with short (crinkled or straight) hairs ± covered by much longer straight hairs; indumentum of the lamina beneath also on the smaller veins, if not so, then the base of the lamina subcordate to emarginate 28
28a. Midrib of lamina beneath minutely whitish puberulous and with much longer appressed whitish hairs; the smaller veins (sub)glabrous; stipules often subglabrous . . . . . **17. F. pilulifera**
b. Midrib of lamina beneath with whitish to brownish short crinkled hairs and longer brownish hairs; indumentum of lamina beneath usually also on the smaller veins; stipules mostly at least partly hairy 29
29a. Lamina above initially hairy, at least on the midrib, this indumentum soon disappearing; figs receptacle 0.8–1.5 cm diam. when dry . . . . . **21. F. trichocerasa**
b. Lamina above also initially entirely glabrous; fig receptacle 1.8–3 cm diam. when dry . . . . . **14. F. funiculosa**
30a. Plants with figs in the leaf axils or just below the leaves 31
b. Plants cauliflorous, flagelliflorous, or ramiflorous 43
31a. Stipules subpersistent 32
b. Stipules caducous 35
32a. Stipules 4–6 cm long . . . . . **70. F. nana**
b. Stipules 0.5–3 cm long 33
33a. Lateral veins (9–)10–25 pairs; epidermis of petiole persistent . . . . . **84. F. saurauioides**
b. Lateral veins 4–10 pairs; epidermis of petiole flaking off 34
34a. Figs receptacle 1.6–1.8 cm diam. when dry, the ostiole c. 4 mm diam; petiole up to 1 cm long . . . . . **37. F. biakensis**
b. Fig receptacle 1–1.3 cm diam, the ostiole 2–2.5 mm diam; petiole up to 2.5 cm long . . . . . **38. F. boanensis**
35a. Shrub up to 1 m tall . . . . . **20. F. suffruticosa**
b. Tree (or shrub much clearly taller than 1 m) 36
36a. Leafy twigs and lamina glabrous or very sparsely white appressed-puberulous 37
b. Leafy twigs and lower surface of lamina ± distinctly hairy 39
37a. Fig receptacle 1.5–2 cm diam. when dry . . . . . **88. F. septica**
b. Fig receptacle 0.5–1.5 cm diam. when dry 38

38a. Lateral veins usually 10–14 pairs; apex of lamina short-acuminate to subacute or obtuse . . . . . **10. F. casearioides**
b. Lateral veins usually 6–10 pairs; apex of lamina acuminate to caudate . . . . . **51. F. fistulosa**
39a. Lamina asymmetric, the margin dentate or denticulate, the base subcordate to deeply cordate and at the broad side of the lamina the lobe ± covering the petiole . . . . . **75. F. papuana**
b. Lamina symmetric, or if asymmetric, then the margin entire and the base cuneate to subcordate, or if cordate, then the lobe not covering the petiole 40
40a. Lamina usually scabrous above and the margin dentate, or if subentire than some or most of the leaves (sub)opposite 41
b. Lamina smooth above; none of the leaves (sub)opposite 42
41a. Fig receptacle 1.5–2.5 cm diam. when dry and the ostiole 2–4 mm diam.; most leaves (sub)opposite . . . . . **58. F. hispida**
b. Fig receptacle 2–4 cm diam. when dry and the ostiole 4–6 mm diam.; some of the leaves (sub)opposite . . . . . **41. F. calopilina**
42a. Apex of lamina short-acuminate to subacute or to obtuse; upper surface of lamina glabrous . . . . . **10. F. casearioides**
b. Apex of lamina acuminate to caudate; upper surface of lamina hairy on the main veins . . . . . **13. F. erythrosperma**
43a. Plants flagelliflorous 44
b. Plants cauliflorous, flagelliflorous, or ramiflorous 48
44a. Fig receptacle 1.5–3 cm diam. when dry 45
b. Fig receptacle 0.7–1.5 cm diam. when dry 46
45a. Ostiole 2–3 mm diam.; epidermis of petiole flaking off . . . . . **58. F. hispida**
b. Ostiole 5–9 mm diam.; epidermis of petiole persistent . . . . . **60. F. iodotricha**
46a. Petiole usually 0.4–1.2 cm long; stipules usually 0.4–1.5 cm long . . . . . **33. F. arfakensis**
b. Petiole usually 1.5–45 cm long; stipule usually 2.5–2.5 cm long 47
47a. Lamina mostly distinctly asymmetric, the base cordate to subcordate (to rounded) at the broad side, subcordate to rounded (to obtuse) at the narrow side; stipules distinctly hairy . . . . . **91. F. subcongesta**
b. Lamina slightly asymmetric, the base obtuse to subcuneate; stipules glabrous or only hairy at the base . . . . . **86. F. scopulifera**
48a. Figs on up to 2 cm long spurs on the older wood (plants ramiflorous to cauliflorous); lamina with entire margin; waxy glands absent 49
b. Figs on branchlets (or spurs) longer than 2 cm or on woody tubercles, plants mostly cauliflorous, rarely ramiflorous; waxy glands usually present 50
49a. Apex of lamina acuminate to caudate, the lamina often ± asymmetric . . . . . **13. F. erythrosperma**
b. Apex of lamina short-acuminate to subacute or to obtuse, the lamina (almost) symmetric . . . . . **10. F. casearioides**
50a. Lamina scabrous or scabridulous above 51
b. Lamina smooth above (but sometimes scabrous or scabridulous beneath) . . . 71
51a. Stipules (sub)persistent 52
b. Stipules caducous 60

52a. Periderm of leaf twig and epidermis of petiole persistent 53
b. Periderm of leafy twig and epidermis of petiole flaking off 56
53a. Stipules 3.5–4 cm long . . . . . **78. F. porrecta**
b. Stipules 0.5–2.5 cm long 54
54a. Peduncle 3–8 cm long . . . . . **36. F. bernaysii**
b. Peduncle up to 2.5 cm long 55
55a. Indumentum of the leafy twigs and lamina consisting of only brown hairs; figs on short, ± tuberculate branchlets; ostiole 2–3 mm diam. . . . . **57. F. hahliana**
b. Indumentum of the leafy twigs and the lamina consisting of brown and (shorter) white hairs of only white hairs; figs on up to 1 m long branchlets; ostiole 5–6 mm diam. . . . . **39. F. botryocarpa**
56a. Hairs on the leafy twigs and the lamina beneath appressed or absent on the leafy twig); figs with basal bracts 3–6 mm long . . . . . **92. F. sublimbata**
b. Hairs on the leafy twigs and the lamina beneath (±) patent (or if almost appressed, then distinctly different in length and colour); figs with basal bracts verticillate and up to 3 mm or 6–10 mm long, or non-verticillate and 2–5 cm long 57
57a. Figs with basal bracts 1–2 mm long; stipules 1–2.5 cm long; lamina mostly asymmetric . . . . . **91. F. subcongesta**
b. Figs with basal bracts at least 2 mm long; stipules often longer than 2.5 m; lamina symmetric or slightly asymmetric 58
58a. Figs with basal bracts 2–3 mm long . . . . . **68. F. morobensis**
b. Figs with basal bracts verticillate and 6–10 mm long or non-verticillate and 2–5 cm long 59
59a. Nodal waxy glands absent; basal bracts not verticillate, 1 or 2, 2–5 cm long . . . . . **79. F. praestans**
b. Nodal waxy glands present; basal bracts verticillate, 3, 6–10 mm long . . . . . **74. F. pachyrrhachis**
60a. Most leaves (sub)opposite . . . . . **58. F. hispida**
b. Most leaves not (sub)opposite 61
61a. Cystoliths in epidermis of the lamina above and beneath (in dry material visible as minute pustules above and as points or minute pustules beneath) . . . . . **39. F. botryocarpa**
b. Cystoliths epidermis of lamina only beneath (in dry material visible as minute points or pustules) 62
62a. Lamina (at least some) strongly asymmetric, base at the broad side deeply cordate with the lobe covering the petiole; fig receptacle 2–4 cm diam. when dry . . . . . **75. F. papuana**
b. Lamina ± asymmetric or symmetric, base cuneate to subcordate, if cordate, then without a lobe covering the petiole 63
63a. Periderm of leafy twig and epidermis of petiole flaking off 64
b. Periderm of leafy twig and epidermis of petiole persistent 66
64a. Most leaves (sub)opposite . . . . . **58. F. hispida**
b. Most leaves not (sub)opposite 65
65a. Figs with basal bracts 1–2 mm long; receptacle 1–2.5 cm diam. when dry . . . . . **91. F. subcongesta**

b. Figs with basal bracts 2–6 mm long; fig receptacle 2–4 cm diam. when dry . . . . . **41. F. calopilina**

66a. Cystoliths in epidermis of lamina above and beneath (in dry material visible as minute pustules above and as points or minute pustules beneath) . . . . . **39. F. botryocarpa**

b. Cystoliths in epidermis of lamina only beneath (in dry material visible as minute points or pustules) 67

67a. Lamina (at least some) strongly asymmetric, base at the broad side deeply cordate with the lobe covering the petiole; fig receptacle 2–4 cm diam. when dry . . . . . **75. F. papuana**

b. Lamina ± asymmetric, base acute to subcordate; fig receptacle 0.8–1.8 cm diam. when dry 68

68a. Peduncle 3–8 cm long . . . . . **36. F. bernaysii**

b. Peduncle 0.7–2.5 cm long 69

69a. Basal bracts 3–6 mm long; ostiole 5–9 mm diam.; mostly above 1500 m . . . . . **60. F. iodotricha**

b. Basal bracts 1.5–2 mm long; ostiole 3–4 mm diam.; up to c. 1350 m 70

70a. Stipules 0.5–1.8 cm long . . . . . **31. F. adelpha**

b. Stipules 2–3 cm long . . . . . **48. F. d'albertisii**

71a. Stipules (sub)persistent 72

b. Stipules caducous 76

72a. Cystoliths in epidermis of lamina above and beneath (in dry material visible as minute pustules above and as points or minute pustules beneath) . . . . . **39. F. botryocarpa**

b. Cystoliths in epidermis of lamina only beneath(in dry material visible as minute points or pustules) 73

73a. Stipules glabrous; leafy twigs, lamina, and petioles glabrous or very sparsely hairy . . . . . **52. F. flagellaris**

b. Stipules, leafy twigs, at least the midrib of the lamina beneath, and/or stipules distinctly hairy (although possibly sparsely so) 74

74a. Stipules 1.5–2.5 cm long . . . . . **86. F. scopulifera**

b. Stipules 0.4–1.5 cm long 75

75a. Base of lamina cuneate to obtuse; petiole 0.4–1.2(–2) cm long **33. F. arfakensis**

b. Base of lamina cordate to subcordate (to rounded); petiole (1–)2–4.5 long . . . . . **91. F. subcongesta**

76a. Periderm of leafy twig and epidermis of petiole persistent 77

b. Periderm of leafy twig and epidermis of petiole flaking off 78

77a. Fig receptacle 1.5–2.5 cm diam. when dry . . . . . **39. F. botryocarpa**

b. Fig receptacle 0.7–1.3 cm diam. when dry . . . . . **33. F. arfakensis**

78a. Most leaves (sub)opposite . . . . . **58. F. hispida**

b. Most leaves not (sub)opposite 79

79a. Lamina glabrous above and beneath 80

b. Lamina beneath or also above hairy (although possibly sparsely) 82

80a. Base of the lamina cordate; petiole 5–14 cm long . . . . . **72. F. novahibernica**

b. Base of the lamina cuneate to rounded (to truncate); petiole mostly up to 5 cm long 81

81a. Fig receptacle 1.5–2.5(–3.5) cm diam. when dry; margin of the lamina entire; stipules up to 6 cm long; basal bracts 1–2 mm long entire . . . . . **88. F. septica**
b. Fig receptacle usually 0.6–1.5 cm diam. when dry; margin of the lamina dentate or if entire, then the stipules up to 1.2–2.5 cm long and the basal bracts 0.5–1 mm . . . . . **51. F. fistulosa**
82a. Ostiole 2–3 mm diam. 83
b. Ostiole 3–10 mm diam. 84
83a. Base of lamina usually cordate to subcordate, the margin flat; figs on branchlets up to 10(–25) cm long on the trunk (or on stolons) . . . . . **91. F. subcongesta**
b. Base of lamina usually cuneate to rounded, margin ± revolute; sually on spurs or woody tubercles up to 4 cm long on the older wood down to the trunk . . . . . **51. F. fistulosa**
84a. Stipules 0.5–1 cm long; figs with basal bracts 1.5–2.5 mm long **45. F. congesta**
b. Stipules 1–3 cm long, or if shorter than 1 cm, then the figs with basal bracts 0.5–1 mm long 85
85a. Lateral veins of the lamina 7–10 pairs; peduncle 0.7–1.7 cm long, the receptacle 1.5–2 cm diam. when dry . . . . . **72. F. novahibernica**
b. Lateral veins of the lamina (4 or) or 5 or 6 pairs; peduncle 0.2–0.4 cm long, the receptacle 0.8–1.5 cm diam. when dry . . . . . **52. F. flagellaris**

Section Sycomorus

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Sycomorus* (Gasp.) Miq., Fl. Ind. Bat. 1, 2 (1859) 319; C.C. Berg, Blumea 49 (2004) 157.

Trees, monoecious or dioecious; internodes not distinctly different in length and leaves not tufted. *Leaves* spirally arranged and lamina symmetric, lamina (sub)coriaceous to chartaceous; cystoliths only beneath; waxy glands in the axils of the basal lateral veins or additional ones elsewhere on the lamina beneath (or on the nodes of leafy twigs); petiole (rather) long. *Figs* cauliflorous, flagelliflorous, or axillary; basal bracts 3, verticillate; lateral bracts absent. *Staminate flowers* subtended by 2 bracteoles; stamens (1 or) 2 (or 3). *Tepals* of pistillate flowers (2–)3–6, free or connate, often irregularly in shape, laciniate and/or narrow, glabrous; styles of long-styled flowers glabrous (or hairy). *Fruits* lenticular, slightly simply, keeled, smooth or ± tuberculate, red-brown (or whitish).

Distribution — The section comprises 19 species and ranges from West Africa to Australia and the Solomon Islands.

Morphology — The section comprises both monoecious and dioecious species. The two groups of species do not differ conspicuously in other characters, neither of vegetative parts nor of flowers and fruits.

Subdivision — The dioecious and monoecious species are ranked in different subsections.

Section Sycomorus subsection Sycomorus

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Sycomorus* (Gasp.) Miq. subsect. *Sycomorus* C.C. Berg, Blumea 49 (2004) 462.

Trees monoecious. Nodal waxy glands absent. *Figs* without internal hairs. *Styles* glabrous. *Fruits* smooth, brownish.

Distribution — Africa (to Yemen) and Madagascar (and adjacent islands) with 12 species, and *F. racemosa* from Sri Lanka to Australia.

Morphology — The section is rather diverse in the African region, as with regard to the size of the trees, the position and dimensions of the figs (see Berg & Wiebes, African fig trees and fig wasps, 1992: 73–84). *Ficus racemosa* is morphologically close to the widespread African *F. sur* Forssk.

1. Ficus racemosa L.

Ficus racemosa L., Sp. Pl. (1753) 922; Burm.f., Fl. Ind. (1768) 226; Lam., Encycl. 2, 2 (1788) 496; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; M.F. Barrett, Bull. Torrey Bot. Club 73 (1946) 312; Vreede, Ann. Jard. Bot. Buitenzorg 51 (1949) 147; Corner, Gard. Bull. Singapore 21 (1965) 34; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 146, t. 21; Kochummen, Tree Fl. Malaya 3 (1978) 154; Tree Fl. Sabah & Sarawak 3 (2000) 297.

Ficus glomerata Roxb., Pl. Coromandel 2 (1799) 13, f. 123; Fl. Ind., ed. Carey 3 (1832) 558; Wight, Ic. 2 (1843) t. 667; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 297; Benth., Fl. Austral. 6 (1873) 178; Kurz, Forest Fl. Burma 2 (1877) 458; Solms, Bot. Zeit. (1885) 548; King, Sp. Ficus 2 (1888) 173, t. 218, 219; Fl. Brit India 5 (1888) 535; Watt, Dict. Econ. Prod. India 3 (1890) 351; Trimen, Fl. Ceyl. 4 (1898) 96; F.M. Bailey, Queensl. Fl. 5 (1902) 1479; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 269; Renner, Bot. Jahrb. Syst. 39 (1907) 406; F.M. Bailey, Compr. Cat. Qld. Pl. (1913) f. 495; Simon, Jahrb. Syst. Wiss. Bot. 54 (1914) 96; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 571; Gagnep., Fl. Indo-Chine 5 (1928) 807; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 58, f. 31; Wayside Trees (1940) 684, f. 251; Anonymous, Wealth of India 4 (1956) 35, t. IV; Worth., Ceylon Trees (1959) f. 408. — *Covellia glomerata* (Roxb.) Miq., London J. Bot. 7 (1848) 465.

Ficus lucescens Blume, Bijdr. (1825) 444. — *Urostigma lucescens* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 341.

Ficus lanceolata Buch.-Ham. ex Roxb., Fl. Ind., ed. Carey 3 (1832); Wight, Ic. 2 (1843) t. 645; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 297; Kurz, Forest Fl. Burma 2 (1877) 457; King, Sp. Ficus 2 (1888) 177, t. 224. — *Covellia lanceolata* (Buch.-Ham. ex Roxb.) Miq., London J. Bot. 7 (1848) 465.

Ficus trichocarpa Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 497, non Blume 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 283; Engl., Bot. Jahrb. Syst. 7 (1886) 452.

Covellia mollis Miq., London J. Bot. 7 (1848) 466; Fl. Ind. Bat. 1, 2 (1859) 326. — *Ficus mollis* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 283, 296, non Vahl 1790, nec Willd. 1798; King, Fl. Brit. India 5 (1888) 536. — *Ficus glomerata* Roxb. var. *mollis* (Miq.) King, Sp. Ficus (1888) 174; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 272; Koord., Atlas Baumart. Java 4 (1916) t. 781 E, 782 A, D. — *Ficus racemosa* L. var. *mollis* (Miq.) M.F. Barrett, Bull. Torrey Bot. Club 73 (1946) 323.

Ficus vesca F. Muell. ex Miq., J. Bot. Néerl. 1 (1861) 243; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; Benth., Fl. Austral. 6 (1873) 178; Domin, Bibl. Bot. 89 (1921) 570. — *Ficus racemosa* L. var. *vesca* (F. Muell ex Miq.) M.F. Barrett, Bull. Torrey Bot. Club 73 (1946) 323.

Ficus chittagonga Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 228, 294; Corner, Gard. Bull. Singapore 21 (1965) 35. — *Ficus glomerata* Roxb. var. *chittagonga* (Miq.) King, Sp. Ficus 2 (1888) 174. — Type: *Hooker f. & Thomson (Ficus no.) 115* (K), Bangladesh, Chittagong, consists of leaves of *F. racemosa* and figs of *F. prostrata* (Miq.) Miq.; the former element is here designated as lectotype.

Ficus trichocarpa Decne. forma *glabrescens* Engl., Bot. Jahrb. Syst. 7 (1886) 452.

Ficus glomerata Roxb. var. *elongata* King, Sp. Ficus 2 (1888) 173; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 269, 274; Koord., Atlas Baumart. Java 4 (1916) t. 781 A–D, 782 B, C; Backer

& Bakh.f., Fl. Java 2 (1965) 26. — *Ficus racemosa* L. var. *elongata* (King) M.F. Barrett, Bull. Torrey Bot. Club 73 (1946) 323.

Ficus glomerata Roxb. var. *miquelii* King, Sp. Ficus (1888) 174. — *Ficus racemosa* L. var. *miquelii* (King) Corner, Gard. Bull. Singapore 21 (1965) 35.

Ficus acidula King, Sp. Ficus 2 (1888) 176, t. 223; Merr., Enum. Born. (1921) 220.

Ficus henrici King, Sp. Ficus 2 (1888) 176.

Ficus semicostata F.M. Bailey, Queensl. Agr. J. 26 (1911) 316, t. 34; Compr. Cat. Qld. Pl. (1913) 504, f. 494; Feddes Repert. Spec. Nov. Regni Veg. 13 (1914) 496.

Tree up to 30 m tall, becoming buttressed; latex white, cream, or pinkish. *Leafy twigs* 1.5–3 mm thick, sparsely to densely white appressed-puberulous; internodes solid; periderm flaking off. *Leaves* spirally arranged (to subdistichous); lamina oblong to lanceolate to subovate (or to subobovate), (2–)6–20 by (1–)3–9 cm, symmetric, (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 beneath; lateral veins 4–9(–12) pairs, the basal pair up to 1/5–1/3 the length of the lamina, unbranched or faintly branched, running ± parallel to the margin, 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–)1.2–2(–3) cm long, sparsely to densely appressed-puberulous to subtomentose or only ciliolate, subpersistent or caducous. *Figs* cauliflorous on clusters of up to c. 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, pink red to purple red or orange at maturity, apex flat to slightly concave, ostiole c. 3 mm diam., prominent; internal hairs absent.

Distribution — Sri Lanka to Myanmar, S China, Vietnam, Thailand, Malesia, and Australia; in *Malesia*: Sumatra, Malay Peninsula, Java, Lesser Sunda Islands, Borneo, Celebes, New Guinea.

Habitat — Forest and secondary growth, often along rivers, at low altitudes.

Notes — 1. The species is rather variable.

2. Inner surface of receptacle contains low flower-bearing protuberances.

Section Sycomorus subsection Neomorphe

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Sycomorus* (Gasp.) Miq. subsect. *Neomorphe* (King) C.C. Berg, Blumea 49 (2004) 158. — *Ficus* L. sect. *Neomorphe* King, Sp. Ficus 1 (1887) 2; 2 (1888) 165; Diels, Bot. Jahrb. Syst. 67 (1935) 218; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 361; Corner, Gard. Bull. Singapore 18 (1960) 32. — *Ficus* L. sect. *Neomorphe* King subsect. *Subcrassiusculifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 362, 364, 386. — *Ficus* L. sect. *Neomorphe* King subsect. *Tenuifoliorae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 362, 364, 386. — *Ficus* L. subg. *Ficus* sect. *Neomorphe* King ser. *Variegatae* Corner subser. *Variegatae* Corner, Gard. Bull. Singapore 18 (1960) 33.

Ficus L. subg. *Ficus* sect. *Neomorphe* King ser. *Auriculatae* Corner, Gard. Bull. Singapore 18 (1960) 33. — *Ficus* L. subg. *Ficus* sect. *Neomorphe* King subser. *Laciniatae* Corner, Gard. Bull. Singapore 18 (1960) 33.

Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Pomifera* Corner ser. *Pomiferae* Corner, Gard. Bull. Singapore 18 (1960) 39; 19 (1962) 395; 21 (1965) 82.
Tremotis Raf., Sylv. Tellur. (1838) 58 — *Ficus* L. sect. *Tremotis* (Raf.) Kuntze in Post & Kuntze, Lex. Gen. Phan. (1903) 236.

Dioecious trees. Nodal waxy glands absent or present. *Figs* without (or with) internal hairs. *Styles* without (or with) hairs. Fruits ± tuberculate or smooth, whitish to brown.

Distribution — From Pakistan to Australia and the Solomon Islands; 6 species, all of them occurring in Malesia. *Ficus nodosa*, *F. robusta*, *F. semivestita*, are confined to New Guinea; *F. variegata* extends to India, Ryukyu Islands, Australia, and the Solomon Islands. The other two species, *F. auriculata* Lour. and *F. hainanensis* Merr. & Chun, are elements of the Sino-Himalayan region.

Morphology — The waxy glands occur more or less clearly in slit-shaped extensions of the axils of the basal lateral veins. The subsection shows ample variation in the features of the perianth of the pistillate flower. The narrow and laciniate to dentate tepals, as found in some species, show similarities to those of subsect. *Sycomorus* or entire, more or less conate tepals show similarities to those of sect. *Sycocarpus*.

2. Ficus auriculata Lour.

Ficus auriculata Lour., Fl. Coch. 2 (1790) 660; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; Merr. & Chun, Sunyatsenia 2 (1935) 216; Corner, Gard. Bull. Singapore 19 (1962) 395; 21 (1965) 82; Philos. Trans., Ser. B, 281 (1978) 383, t. 7.
Ficus macrophylla Roxb. & Buch.-Ham. ex Sm. in Rees, Cycl. 14 (1810) Ficus 32, non Desf. ex Pers. 1807; Roxb., Fl. Ind., ed. Carey 3 (1832) 556; Wight, Ic. 2 (1843) t. 673. — *Ficus roxburghii* Wall. ex Steud., Nomencl. Bot. ed. 2, 1 (1840) 637; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296, non Miq. 1848 quae est *F. hirta* Vahl; Brandis, For. Fl. (1874) 422; Kurz, Forest Fl. Burma 2 (1877) 460; King, Sp. Ficus 2 (1888) 168, t. 211; Fl. Brit. India 5 (1888) 534; D.D. Cunn., Ann. Roy. Bot. Gard. Calc. 1 (1888) App.; Watt, Dict. Econ. Prod. India 3 (1890) 361; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 467; Renner, Bot. Jahrb. Syst. 39 (1907) 406; Sprague & Hutch., Kew Bull. (1913) 289 (plate); Gagnep., Fl. Indo-Chine 5 (1928) 806; Hand.-Mazz., Symb. Sin. 7 (1929) 100; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1014; Rehder, J. Arnold Arbor. 17 (1936) 81; M.F. Barrett, Am. Midl. Nat. 45 (1951) 176; Mabb. in Maninal, Bot. Hist. Hort. Maleb. (1980) 90. — *Covellia macrophylla* (Roxb. ex Sm.) Miq., London J. Bot. 7 (1848) 465.
Ficus rotundifolia Roxb., Fl. Ind., ed. Carey 3 (1832) 555; Miq., London J. Bot. 7 (1848) 228; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 290; King, Sp. Ficus 2 (1888) 183.
Ficus sclerocarpa Griff., Notul. Pl. Asiat. 4 (1854) 397; Ic. Pl. Asiat. 4 (1854) t. 558, '*scleroptera*'.
Ficus regia Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 230, 296; Kurz, Forest Fl. Burma 2 (1877) 459.
Ficus oligodon Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 234, 297; Corner, Gard. Bull. Singapore 18 (1960) 43; 19 (1962) 395; 21 (1965) 82; Philos. Trans., Ser. B, 281 (1978) 383, t. 7; Kochummen, Tree Fl. Malaya 3 (1978) 152.
Ficus pomifera Wall. ex King, Sp. Ficus 2 (1888) 171, t. 215, non Kurz 1873; King, Fl. Brit. India 5 (1888) 535; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 465; Ridl., Fl. Malay Penins. 3 (1924) 350; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 46, f. 24; Wayside Trees (1940) 686.
?*Ficus macrocarpa* H. Lév. & Vaniot, Mem. Real Acad. Ci. Barcelona 3 (1907) 152, non Blume 1823; Rehder, J. Arnold Arbor. 17 (1936) 81.

Tree up to 15(–20) m tall, becoming shortly buttressed. *Leafy twigs* 2–10 mm thick, puberulous to subtomentose or glabrous; internodes hollow (or solid); periderm flaking off or persistent. *Leaves* spirally arranged to subdistichous; lamina cordiform to ovate

or to suborbicular, (6–)10–30(–40) by (3–)7–25(–32) cm, symmetric, chartaceous to subcoriaceous, apex short-acuminate to acute, base cordate to rounded (to broadly cuneate), margin coarsely dentate to denticulate to subentire; upper surface glabrous or sparsely puberulous on the main veins, smooth, lower surface densely to sparsely

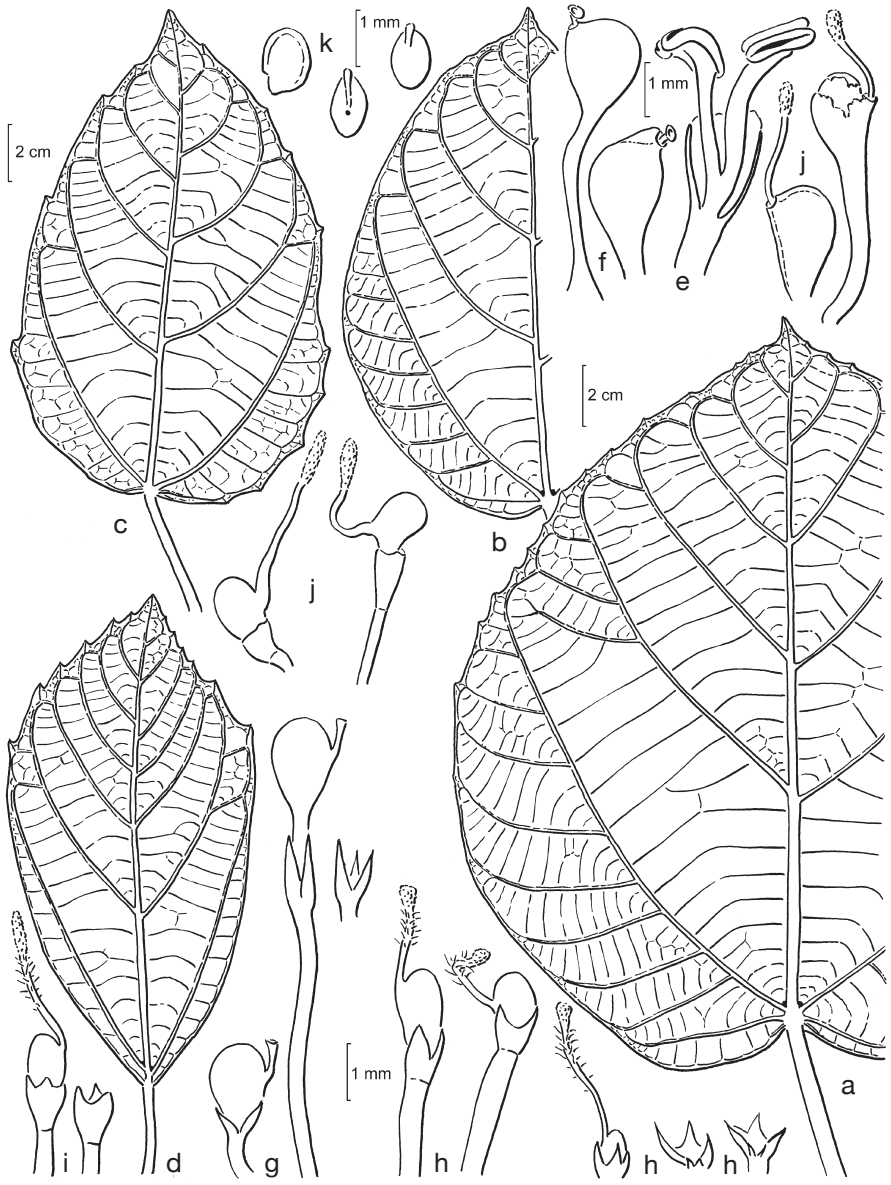


Fig. 56. *Ficus auriculata* Lour. a–d. Leaves; e. staminate flower; f, g. short-styled flowers; h, i. long-styled flowers and perianths; j. long-styled flowers; k. fruits (a, e–h, k: collections used unknown; b: *Kerr 4946*; c: *Kerr 3410*; d: *d'Alleizette s.n.*; i: *W.T. Tsang 29392*; j: *Hooker & Thomson Covellia 8*). From Philos. Trans., Ser. B, 281 (1978) 384.

puberulous on the veins or only on the main veins or glabrous; lateral veins 3–7 pairs, basal pair up to 1/3–2/3 the length of the lamina, (usually) branched, tertiary venation scalariform; waxy glands in the slit-shaped extensions of the axils of the (main) basal lateral veins; petiole 2–15(–30) cm long, whitish to brownish puberulous or glabrous, epidermis flaking off; stipules 1.5–3 cm long, densely to sparsely whitish to brownish appressed-puberulous to subsericeous or glabrous, caducous. *Figs* (cauliflorous) on clustered, short (branched) leafless branchlets on the trunk and main branches; peduncle 1–8 cm long; basal bracts 3, (2–)4–7 mm long, persistent; receptacle subpyriform to subglobose to depressed-globose, 2–6 cm diam. when dry, up to 10 cm diam. when fresh, 0–1.5 cm long stipitate, densely to sparsely brown to whitish puberulous to subtomentose to subvelutinous or subglabrous, with numerous strong to weak longitudinal ridges, occasionally with 1 or a few lateral bracts, red(dish), red-brown, orange, or purple at maturity, apex ± concave to flat, ostiole (4–)6–10(–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-parted; style of the long-styled flowers glabrous or hairy. — **Fig. 56.**

Distribution — Pakistan to S China, Indochina, Thailand, and Malesia; in *Malesia*: Malay Peninsula (to Selangor and Pahang).

Habitat — Forest, e.g., mixed deciduous forest, and secondary growth, at altitudes up to c. 1300 m, in China up to 2100 m.

Notes — 1. It proved to be impossible to separate satisfactorily the material identified as *F. auriculata* and as *F. oligodon*. The vegetative characters do not provide satisfactory differentiating characters. The characters of the flowers do neither: the features of the perianth (dark-red to pinkish; saccate to 3-lobed to -parted), the internal bristles (present or absent), the style of the long-styled flower (hairy versus glabrous), or the shape of its stigma. Therefore, *F. oligodon* is reduced to a synonym of *F. auriculata*. The former represented by material with (sub)ovate to elliptic (to oblong) laminas and the latter material with cordiform to suborbicular laminas, often entire and usually with long petioles. The *auriculata*-form appears to be the common form in the northern part of the range, and the *oligodon*-form in the southern part. Corner regarded the intermediates as results of hybridisation.

2. *Ficus hainanensis* has been mixed up with the '*oligodon*' form of *F. auriculata*. This species is cauliflorous to (sub)flagelliflorous, known from Thailand, Vietnam and S China, and is distinct by up to 30 (or more?) cm long fig-bearing branchlets on the lower part and very base of the trunk (and in the litter). The lamina is never broadest below and even tend to be broadest above the middle. Further studies might prove that *F. hainanensis* merits only the status of subspecies of *F. auriculata*.

3. Ficus nodosa Teijsm. & Binn.

Ficus nodosa Teijsm. & Binn., Natuurk. Tijdschr. Ned.-Indië 29 (1866) 245; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; King, Sp. Ficus 2 (1888) 167, t. 210; Bull. Soc. Bot. Belg. 34 (1895) 192; K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 288; Summerh., J. Arnold Arbor. 10 (1929) 150; Diels, Bot. Jahrb. Syst. 67 (1935) 218; Summerh., J. Arnold Arbor. 22 (1941) 101; Corner, Gard. Bull. Singapore 21 (1965) 83.

?*Ficus suringarii* Carrière, Rev. Hort. (1866) 338.

Ficus du Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 283.

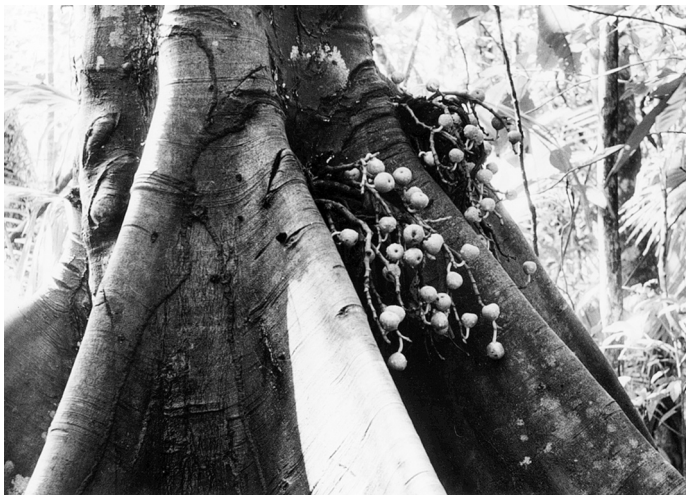


Fig. 57. *Ficus nodosa* Teijsm. & Binn. Base of trunk with fig-bearing branchlets, Papua New Guinea. Photo R.D. Hoogland.

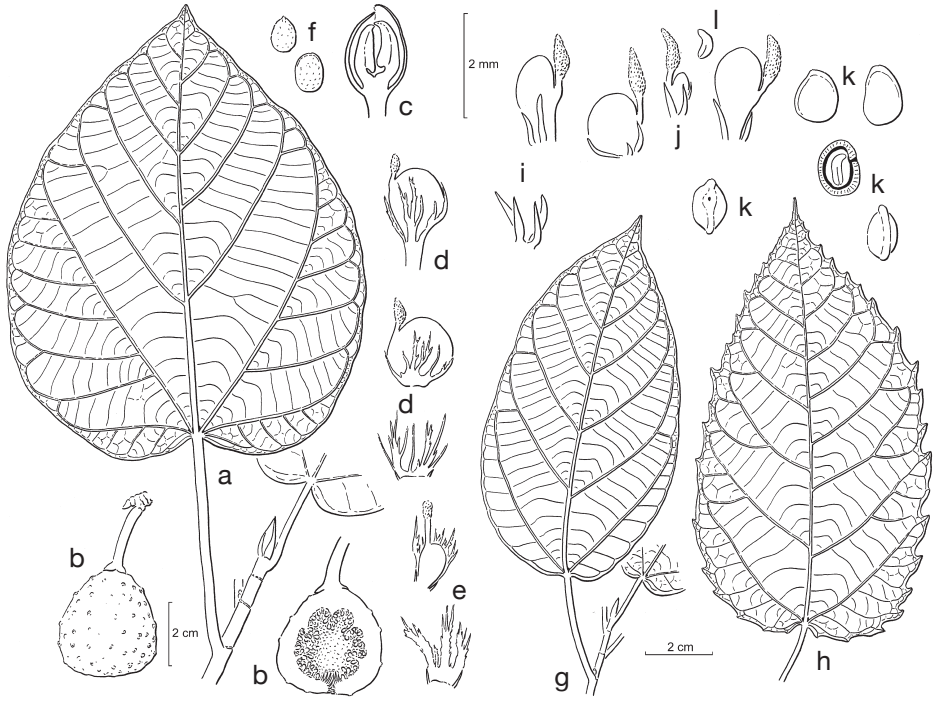


Fig. 58. a–f: *Ficus nodosa* Teijsm. & Binn. a. Leafy twig; b. figs; c. staminate flower; d. short-styled flowers and perianths; e. long-styled flower and perianth; f. fruits. — g–l: *Ficus variegata* Blume. g. Leafy twig; h. sapling leaf; i. short-styled flower and perianth; j. long-styled flowers; k. fruits; l. embryo (all: collections used unknown). From Philos. Trans., Ser. B, 253 (1967) 122.

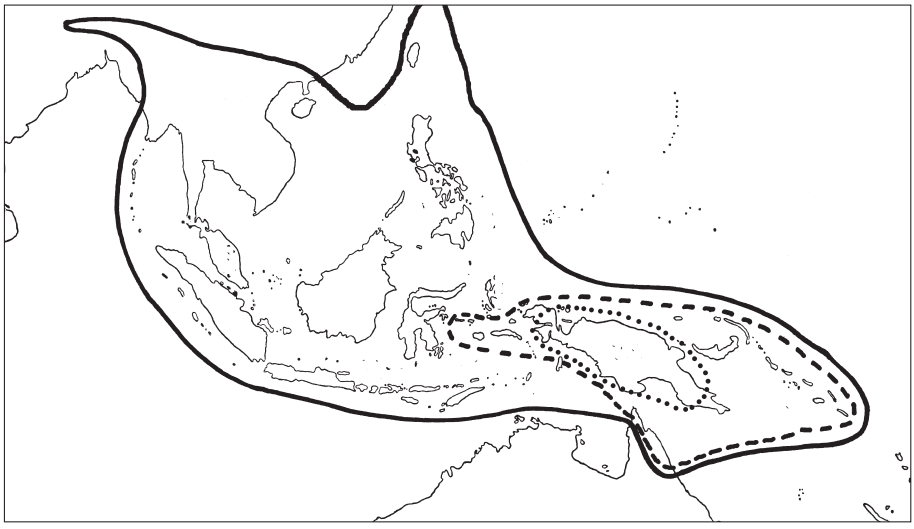
Tree up to 30 m tall, becoming up to 4 m high buttressed, deciduous. *Leafy twigs* 4–7 mm thick, glabrous; internodes hollow (or solid?), often with nodal waxy glands; periderm flaking off. *Leaves* spirally arranged (tending to distichous); lamina ovate to cordiform, (7–)10–38 by (4–)7–30, symmetric, (sub)coriaceous, apex acuminate to subacute or obtuse, base cordate to rounded, margin repand to subentire (or dentate); upper surface sparsely puberulous on the main veins or glabrous, smooth, lower surface sparsely to rather densely puberulous on the main veins or also on the smaller ones or glabrous; cystoliths only beneath; lateral veins 4–7 pairs, the basal pair up to 1/3–1/2 (–4/5) the length of the lamina, branched, often unequal in length, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of the (main) basal lateral veins; petiole (2–)4–10(–15) cm long, densely (sub)tomentose to sparsely puberulous or glabrous, the epidermis flaking off; stipules (0.8–)1.5–2.5(–3) cm long, whitish (to yellowish) (sub)sericeous (or glabrous), caducous. *Figs* cauliflorous on slender to stout, usually branched up to 60 cm long branchlets on the trunk and main branches; peduncle 0.5–1.5 cm long; basal bracts 3, 2–3 mm long, (early) caducous or subpersistent; receptacle subglobose to depressed-globose to subpyriform to subobovoid, 1.5–3 cm diam. when dry, 2–3.5 cm diam. when fresh, non-stipitate, glabrous, yellow to purple brown at maturity, apex ± concave, ostiole 2–3 mm diam., ± prominent; internal hairs absent. *Tepals* of the pistillate flowers laciniate-fimbriate. — **Fig. 57, 58a–f; Map 7.**

Distribution — From Malesia to the Solomon Islands and Australia (Queensland); in *Malesia*: Moluccas, New Guinea (incl. New Britain and New Ireland).

Habitat — Forest, savannah, and secondary growth, at altitudes up to 1000 m.

Notes — 1. The leafy twigs and petioles are sometimes densely white appressed-puberulous in Queensland and the Solomon Islands

2. Glabrous stipules and dentate margins are apparently subjuvenile features.



Map 7. Distribution of some species of subg. *Sycomorus* subsect. *Neomorphe*: *F. nodosa* Teijsm. & Binn. (broken line); *F. robusta* Corner (dotted line); *F. variegata* Blume (continuous line).

4. Ficus robusta Corner

Ficus robusta Corner, Gard. Bull. Singapore 18 (1960) 34; 21 (1965) 83.

Tree up to 35 m tall, becoming up to 5 m high buttressed. *Leafy twigs* 5–10 mm thick, tomentose to hirtellous, often with nodal waxy glands; internodes hollow; periderm flaking off. *Leaves* spirally arranged; lamina cordiform, 20–40(–60) by 15–35(–40)

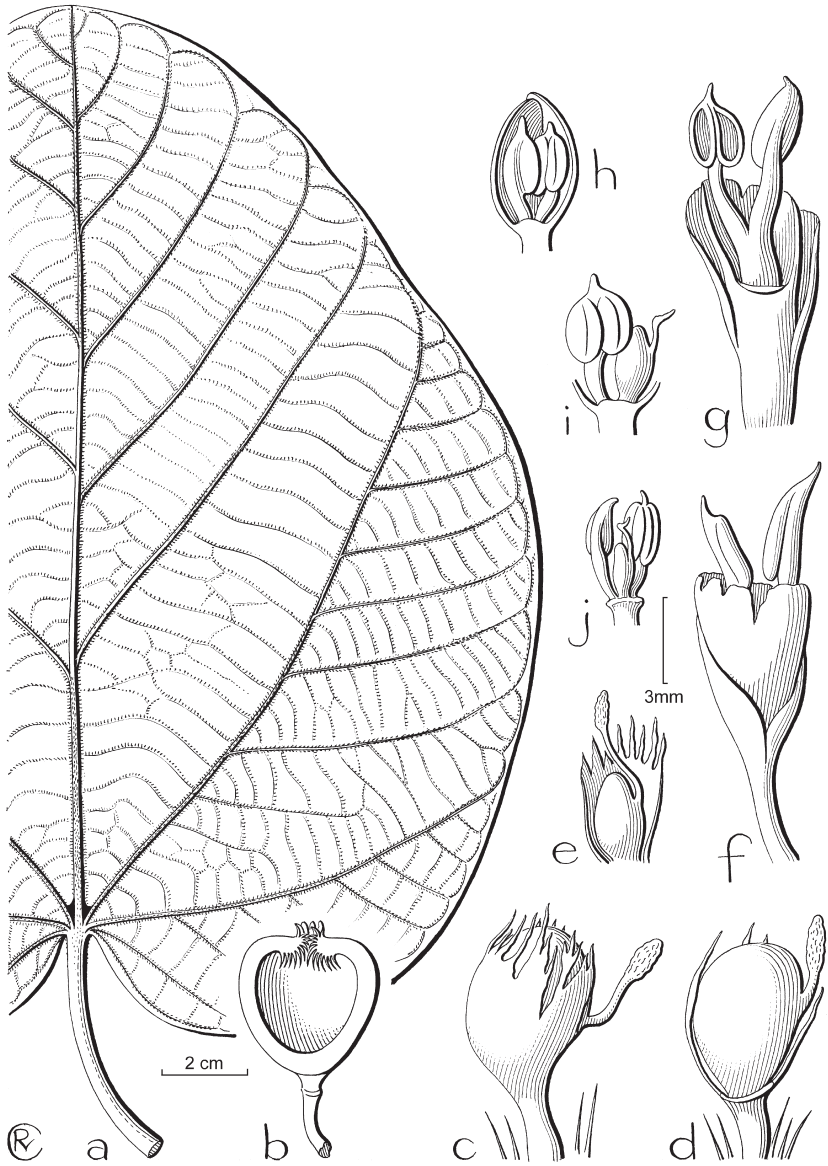


Fig. 59. *Ficus robusta* Corner. a. Leaf; b. fig; c–e. short-styled flowers; f–j. staminate flowers (a–e: *Hort. Bog. XV J.B. XXIX*; f–j: *Carr 16323*).

cm, symmetric, subcoriaceous to chartaceous, apex shortly acuminate to rounded, base cordate, margin entire to dentate; upper surface hispid to hispidulous, on the main veins to hirtellous, ± scabrous, lower surface ± densely hirtellous to tomentose on the veins; cystoliths only beneath; lateral veins 6–8 pairs, the basal pair up to 1/2–2/3 the length of the lamina, branched, other lateral veins often branched or furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of the (main) basal lateral veins; petiole 6–20 cm long, puberulous to hirtellous, the epidermis flaking off; stipules 1.5–3 cm long, brown subsericeous, caducous. *Figs* axillary or cauliflorous on sparingly branched, up to 5 cm long leafless branchlets on the older wood or in the leaf axils; peduncle 1–3.5 cm long; basal bracts 3, 3–9 mm long, caducous; receptacle (sub)pyriform, 2.5–4 cm diam. when dry, 4–7 cm diam. when fresh, puberulous to hirtellous, green at maturity, apex flat to slightly concave, ostiole 2–5 mm diam., ± prominent, surrounded by 5 erect apical bracts; internal hairs abundant, white to brown. *Tepals* of the pistillate flowers laciniate-fimbriate. *Style* glabrous. — **Fig. 59; Map 7.**

Distribution — *Malesia*: New Guinea.

Habitat — Forest and secondary growth, often along streams, at low altitudes.

5. **Ficus semivestita** Corner

Ficus semivestita Corner, Gard. Bull. Singapore 18 (1960) 34; 21 (1965) 83.

Tree up to 40 m tall, becoming up to 9 m high buttressed. *Leafy twigs* 4–6 mm thick, brownish subvelutinous; internodes hollow or solid; periderm flaking off. *Leaves* spirally arranged; lamina ovate to cordiform, (6–)12–24 by (3.5–)8–18 cm, symmetric, subcoriaceous to chartaceous, apex acuminate to subacute, base cordate to subcordate, margin (sub)entire; upper surface densely brownish (sub)tomentose on the main veins, smooth, lower surface densely brownish (sub)tomentose on the veins; cystoliths only beneath; lateral veins 5–8 pairs, the basal pair up to c. 1/2 the length of the lamina, branched, other lateral veins often branched or furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of the (main) basal lateral veins; petiole 2–7 cm long, brown subvelutinous, the epidermis flaking off; stipules 0.8–1.5 cm long, brownish (sub)sericeous, caducous. *Figs* axillary or just below the leaves, solitary; peduncle 1.5–3 cm long; basal bracts 3, 3–4 mm long, caducous; receptacle pyriform to subglobose to ovoid, 2.5–3.5 cm diam. when dry, 3–4 cm diam. when fresh, greenish (?) at maturity, apex flat, ostiole 3–4 mm diam., prominent; wall with flower-bearing inward projections; internal hairs abundant. *Tepals* of pistillate flowers narrow, entire or sublaciniate.

Distribution — *Malesia*: New Guinea.

Habitat — Forest and secondary growth, at altitudes up to c. 1200 m.

6. **Ficus variegata** Blume

Ficus variegata Blume, Bijdr. (1825) 459; Miq., Fl. Ind. Bat. 1, 2 (1859) 320; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; King, Sp. Ficus 2 (1888) 169, t. 212; Fl. Brit. India 5 (1888) 535; Koord., Minah. (1898) 608; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 263; Elmer, Leafl. Philipp. Bot. 2 (1908) 549; 4 (1911) 1270; G. Karst. & Schenck, Vegetationsbilder 10 (1912) t. 21; Simon, Jahrb.

Syst. Wiss. Bot. 54 (1914) 92; Koord., Atlas Baumart. Java 4 (1918) t. 779, 780; Merr., Enum. Born. (1921) 228; Enum. Philipp. Flow. Pl. 2 (1923) 68; Ridl., Fl. Malay Penins. 5 (1925) 335; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 577; Gagnep., Fl. Indo-Chine 5 (1928) 808; Ochse & Bakh., Veg. Dutch East Indies (1931) 505; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 48, t. 25, 26; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1015; Diels, Bot. Jahrb. Syst. 67 (1935) 219; Schimper-v. Faber, Pfl. Geogr. ed. 3, 1 (1935) 459; Elmer, Leafl. Philipp. Bot. 9 (1937) 3450; Corner, Wayside Trees (1940) 686, t. 205; Holttum, Gard. Bull. Singapore 11 (1940) 141; Summerh., J. Arnold Arbor. 22 (1941) 102; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 366; Steenis, Blumea 6 (1948) 259; Backer & Bakh.f., Fl. Java 2 (1965) 28, 32; Corner, Gard. Bull. Singapore 21 (1965) 83; Kochummen, Tree Fl. Malaya 3 (1978) 160; Tree Fl. Sabah & Sarawak 3 (2000) 314, t. 12.

Ficus cordifolia Blume, Bijdr. (1825) 438; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 260, 285; King, Sp. Ficus 2 (1888) 180, t. 225; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 57; Backer, Blumea 6 (1948) 303.

Ficus subracemosa Blume, Bijdr. (1825) 469; Miq., Fl. Ind. Bat. 1, 2 (1859) 320; Choix Pl. Buitenzorg (1864) t. 13; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 282, 294.

Ficus amboinensis Kostel., Allg. Med. Pharm. Fl. 2 (1831) 408.

Ficus racemifera Roxb., Fl. Ind., ed. Carey 3 (1832) 560; Wight, Ic. 2 (1843) t. 639. — *Covellia racemifera* (Roxb.) Miq., London J. Bot. 7 (1848) 465; Fl. Ind. Bat. 1, 2 (1859) 325.

Ficus laevigata Blanco, Fl. Filip. (1837) 682, non Vahl 1805; ed. 2 (1845) 474; Náves in Blanco, Fl. Filip., ed. 3, 3 (1879) 86; Merr., Sp. Blancoan. (1918) 125.

Sycomorus capensis (Thunb.) Miq. forma *tropica* Miq., Pl. Jungh. (1851) 64; Fl. Ind. Bat. 1, 2 (1859) 321.

Sycomorus gummiflua Miq., Pl. Jungh. (1851) 64; Fl. Ind. Bat. 1, 2 (1859) 320, 321, nomen nov. illegit. pro *F. variegata* Blume. — *Ficus gummiflua* (Miq.) Miq. ex Jungh., Java 1 (1853) in nota; nomen illegit. — *Ficus ceriflua* Jungh., Java 1 (1853) 439, nomen corrig. pro *F. gummiflua* (Miq.) Miq. ex Jungh., nomen illegit. — *Ficus cerifera* Blume ex Bleekrode, Ann. Sci. Nat. Bot., Sér. 4, 3 (1855) 333, t. 14. — *Ficus variegata* Blume var. *pilosior* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295.

Ficus subopaca Miq., Fl. Ind. Bat. 1, 2 (1859) 320.

Urostigma javanicum Miq., Fl. Ind. Bat. 1, 2 (1859) 334.

Ficus chlorocarpa Benth., Fl. Honk. (1861) 330; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296. — *Ficus variegata* Blume var. *chlorocarpa* (Benth.) King, Sp. Ficus 2 (1888) 197, t. 213; Corner, Gard. Bull. Singapore 21 (1965) 83.

Ficus sycomoroides Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 230, 295; King, Sp. Ficus 2 (1888) 172, t. 217. — *Ficus variegata* Blume var. *sycomoroides* (Miq.) Corner, Gard. Bull. Singapore 18 (1960) 33.

Ficus ehretioides F. Muell. ex Benth., Fl. Austral. 6 (1873) 171; F.M. Bailey, Queensl. Fl. 5 (1902) 1473; Compr. Cat. Qld. Pl. (1913) 487, f. 487; Domin, Bibl. Bot. 89 (1921) 567, f. 119.

Ficus integrifolia Elmer, Leafl. Philipp. Bot. 1 (1906) 61, 260; 2 (1908) 550; 4 (1911) 1324; 7 (1914) 2410; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 54; Elmer, Leafl. Philipp. Bot. 9 (1937) 3447; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 365.

Ficus latsoni Elmer, Leafl. Philipp. Bot. 1 (1906) 204; (1907) 260; 4 (1911) 1270, 1324.

Ficus paucinervia Merr., Philipp. J. Sci., 1, Suppl. (1906) 44; Enum. Philipp. Flow. Pl. 2 (1923) 54. — *Ficus variegata* Blume forma *paucinervia* (Merr.) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 367.

Ficus garciae Elmer, Leafl. Philipp. Bot. 2 (1908) 550; 7 (1914) 2395; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 52; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 371. — *Ficus variegata* Blume var. *garciae* (Elmer) Corner, Gard. Bull. Singapore 18 (1960) 33.

Ficus konishii Hayata, Mat. Fl. Formos. (1911) 273; Ic. Pl. Formos. 8 (1919) 126, t. 51; Kaneh., Formos. Trees (1917) 520; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 31, 87.

Ficus glochidiifolia Hayata, Ic. Pl. Formos. 8 (1919) 126, f. 52; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 59, 87.

Ficus polysyce Ridl., J. Straits Branch Roy. Asiat. Soc. 82 (1920) 195, p.p.; Fl. Malay Penins. 3 (1924) 342, f. 156; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 42.

Ficus tenimbrensis S. Moore, J. Bot. 63, Suppl. (1925) 111. — *Ficus sum* Gagnep., Notul. Syst. (Paris) 4 (1927) 96; Fl. Indo-Chine 5 (1929) 828, t. 95.
Ficus viridicarpa Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 52, f. 27–29; Wayside Trees (1940) 687; Gard. Bull. Singapore 21 (1965) 83; Kochummen, Tree Fl. Malaya 3 (1978) 161.
Ficus compressitora Elmer, Leafl. Philipp. Bot. 9 (1937) 3443; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 314, 367.
Ficus ilangoides Elmer, Leafl. Philipp. Bot. 9 (1937) 3445; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 372. — *Ficus variegata* Blume var. *ilangoides* (Elmer) Corner, Gard. Bull. Singapore 18 (1960) 33.
Ficus agusanensis Elmer, Leafl. Philipp. Bot. 10 (1939) 3762.
Ficus variegata Blume forma *rotundata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 367.
Ficus glomerata auct. non Roxb.: Elmer, Leafl. Philipp. Bot. 1 (1907) 260.
Ficus garciae auct. non Elmer: Elmer, Leafl. Philipp. Bot. 4 (1912) 1384.

Deciduous tree up to 40 m tall, becoming buttressed. *Leafy twigs* 2–5 mm thick, glabrous or sparsely white appressed-puberulous; internodes hollow or solid; periderm flaking off. *Leaves* spirally arranged; lamina ovate to elliptic to oblong, 6–20(–35) by 2–10(–15) cm, symmetric; subcoriaceous to chartaceous (or to coriaceous), apex acuminate to subacute or obtuse, base cordate to subcordate to obtuse (or to cuneate to subattenuate), margin coarsely dentate to entire; upper surface glabrous or puberulous on the main veins, smooth, lower surface minutely appressed-puberulous (or patent-puberulous) on the veins; cystoliths only beneath lateral veins (3–)4–9(–14) pairs, the basal pair up to 1/4–2/3 the length of the lamina, often unequal in length, branched, some or none of the other lateral veins furcate far 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(–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* ramiflorous to cauliflorous on tuberculate spurs or clustered sparingly branched, up to 7 cm long leafless branchlets on older wood, down to the trunk; peduncle (0.5–)1–6 cm long; basal bracts 3, 0.5–2.5 mm long, (obliquely) verticillate, sometimes ± scattered, persistent (or caducous); receptacle subglobose to pyriform to ellipsoid, (1–)1.5–2.5 cm diam. when dry, (1.5–)2–3.5(–5) cm diam. when fresh, up to 0.8 cm long stipitate or non-stipitate, (sub)glabrous or minutely puberulous, pink to red (or sometimes green) at maturity, when dry sometimes faintly ribbed, the inner surface often with low flower-bearing projections, apex ± concave to flat or slightly convex, ostiole 3–4 mm diam., ± prominent; wall up to 8 mm thick when dry; internal bristles usually absent. *Tepals* of pistillate flowers free or basally connate, lanceolate or spathulate, entire. *Styles* glabrous. *Fruits* smooth. — **Fig. 58g–l; Map 7.**

Distribution — From NE India to Myanmar, S China, Taiwan, Ryukyu Islands, Indochina, S Andaman Islands, and to Thailand, Malesia, the Solomon Islands, and Australia (Queensland); in *Malesia*: throughout the region.

Habitat — Forest and secondary growth, at altitudes up to 1200 m; often in villages and gardens.

Notes — 1. The species is variable, as in the shape, the dimensions, and the venation of the leaves, or to a lesser degree in the indumentum. Some varieties have been

recognized on the basis of this variation. *Ficus viridicarpa,* which was provisionally regarded as distinct (Corner 1933, 1965) as the ripe figs remained greenish at maturity in stead of turning pink or red, is included in *F. variegata* here. The form in which the figs remain greenish at full maturity is found in Lower Thailand, the Malay Peninsula, and West Java.

2. Material from the Ryukyu Islands, Taiwan, the Philippines, Borneo, and Celebes, tend to have yellowish hairy stipules. The lamina base is often cuneate or may even be subattenuate in the northern part of the species range.

3. Sterile material of *F. nodosa* is difficult to distinguish from *F. variegata*. The former species has usually somewhat longer stipules (mostly 1.5–2.5 cm of which the whole outer surface is covered with whitish or sometimes yellowish hairs, whereas in the latter species the stipules are mostly 0.5–1.2 cm long and (usually) glabrous in the regions where they co-occur. In *F. nodosa*, small waxy glands are common on the nodes, such glands are absent in *F. variegata*.

4. The inner surface of the receptacle has inconspicuous flower-bearing processes.

Section Adenosperma

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Adenosperma* Corner, Reinwardtia 4 (1958) 43; Gard. Bull. Singapore 18 (1960) 26; Philos. Trans., Ser. B, 256 (1969) 319.

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Adenosperma* Corner ser. *Amphigenae* Corner, Reinwardtia 4 (1958) 43.

Ficus L. subg. *Ficus* sect. *Adenosperma* Corner ser. *Hypogenae* Corner, Reinwardtia 4 (1958) 43.

Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Auriculisperma* Corner ser. *Vitienses* Corner, Gard. Bull. Singapore 18 (1960) 38.

Dioecious shrubs or trees, the branches often with the proximal internodes long, becoming (gradually) shorter and, therefore, the leaves terminally ± tufted, the lower internodes only with stipules or with much reduced laminas (*Terminalia*-branching). *Leaves* spirally arranged and often tending to subdistichous or distichous; lamina often slightly to distinctly asymmetric, coriaceous to chartaceous, mostly smooth, margin entire; cystoliths above and beneath or only beneath; waxy glands usually present, in the axils of one or both of the basal lateral veins and also in the furcations of the lateral veins, rarely absent. *Figs* in all species in the leaf axils, and in some also on spurs below the leaves and/or in short and branched leafless branchlets on the trunk, mostly pedunculate; basal bracts often not distinctly verticillate or ± scattered, lateral bracts often present; internal hairs mostly present. *Staminate flowers* subtended by 2 bracteoles; stamen 1. *Tepals* of pistillate flowers 3–6, (almost) free, sometimes distinctly connate, glabrous (or ciliolate); styles glabrous. *Fruits* red-brown, compressed, usually double keeled (at the base), smooth.

DISTRIBUTION

New Guinea is evidently the centre of this section. The majority of the 20 species are confined to New Guinea, some extend to the Moluccas and Celebes, to the Solomon Islands, and/or to Queensland. *Ficus indigofera* Rech. and *F. verticillaris* Corner are

confined to the Solomon Islands and *F. vitiensis* Seem. to Fiji. The section is associated with riverine habitats, some are occasionally rheophytic, but *F. arbuscula* usually so (see Van Steenis, Rheophytes of the world, 1981).

Several species are elements of montane forest, as *Nothofagus* forest (in New Guinea).

MORPHOLOGY

Habit — Most species show more or less clearly *Terminalia*-branching (see p. 000), but without terminal tufts of stipules. Features of this mode of branching do not occur in the two species with distichous leaves (*F. endochaete* and *F. umbonata*) and neither in the two species with large leaves (*F. megalophylla* and *F. saccata*). This characteristic branch construction is most apparent in the frutescent species with spirally arranged small or medium-sized leaves (as *F. arbuscula*), less so in the arborescent ones, constituting the majority of the section.

Both pachycladous and leptocladous species are found in the sect. *Adenosperma*.

Leaves — The leaves vary from large, in *F. megalophylla* and *F. saccata*, to small, as often in *F. adenosperma* and *F. trichocerasa*. The tertiary venation is mostly distinctly scalariform, but reticulate to subscalariform in *F. adenosperma*. The leaf margin is always entire.

Waxy glands — Small waxy glands are occasionally found in nodes of leafy twigs. Waxy glands usually occur in the axils of the basal lateral veins beneath, often only in one of the pairs or always so in *F. endochaete*. Additional small waxy glands occur in furcations of the lateral veins of large leaves. The glands are absent in *F. erythrosperma*.

Inflorescences — In all species the figs occur in pairs or solitary in the leaf axils. In several species they also occur on short spurs on the smaller branches. In some species the figs are borne on branched leafless branchlets on the trunk (or also on the main branches?). It is not quite clear whether ramiflory and cauliflory is related to the age of the tree or shrub. Some label data suggest that cauliflory and the axillary position of the figs do not always occur simultaneously.

The basal bracts are often non-verticillate, but may occur ± scattered on the peduncle. Lateral bracts are common in most of the species.

Internal hairs are present in most species, often abundantly, but they are always (?) absent in *F. austrina* and sometimes so in *F. casearioides*.

Flowers — The tepals of pistillate flowers are mostly free or almost so, but occasionally extensively connate as in *F. casearioides*. Bracteoles subtending and enveloping the staminate flowers are not found in *F. endochaete*.

Fruits — They have a double keel in the basal part in most species, but not in *F. austrina* and *F. megalophylla* (and neither the Melanesian *F. indigofera*, *F. verticillaris,* and *F. vitiensis*).

SUBDIVISION AND DELIMITATION

Subdivision — This section was formally subdivided into groups of species (Corner, Reinwardtia 4, 3 (1958) 44): ser. *Amphigenae*, with the cystoliths in both upper and lower surfaces, and ser. *Hypogenae* with cystoliths only beneath. The following groups of ± closely related species can be recognized:

1. *Ficus megalophylla* and *F. saccata*: shrubs or small trees with large tufted leaves and large persistent stipules;
2. *Ficus endochaete* and *F. umbonata*: trees with distichous leaves;
3. *Ficus arbuscula* and *F. verticillaris* (from the Solomon Islands): rheophytic shrubs;
4. *Ficus adenosperma*, *F. comitis*, and *F. mollior*: trees with cystoliths in the lamina both above and beneath;
5. *Ficus austrina* and *F. casearioides*: trees with cystoliths in the lamina only beneath and most parts glabrous or at most appressed-puberulous;
6. *Ficus erythrosperma*, *F. funiculosa*, *F. pilulifera*, *F. subcuneata*, *F. suffruticosa*, and *F. trichocerasa*: trees (or shrubs) with cystoliths in the lamina only beneath and most parts ± distinctly hairy.

Delimitation — There is little doubt that the species mentioned under 3–6 above belong to a natural/monophyletic group, largely because of sharing the same structure of the branches. As the characteristic branch construction is not found in the species ranked under 1) and 2), it is not quite certain whether they really belong to the section *Adenosperma*, or can be linked to sect. *Dammaropsis*.

The relationship of the majority of the Malesian species (3–6) to *F. indigofera* Rech. and *F. vitiensis* Seem. are also somewhat puzzling (see p. 305). In material of the latter species features of *Terminalia*-branching are not found. They are clearly present in the unproblematic *F. verticillaris*.

POLLINATORS

Species of *Ceratosolen* subg. *Ceratosolen* are the pollinators of most species of this section, but species of subg. *Strepitus* are the pollinators of *F. indigofera* and *F. vitiensis* (cf. Wiebes, The Indo-Australian Agaoninae (pollinators of figs), 1994).

7. **Ficus adenosperma** Miq.

Ficus adenosperma Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 233, 296; King, Sp. Ficus 1 (1887) 7, t. 14; Renner, Bot. Jahrb. Syst. 39 (1907) 393; Summerh., J. Arnold Arbor. 10 (1929) 143, 206; Corner, Gard. Bull. Singapore 21 (1965) 81.

Ficus depressa Benth., Fl. Austral. 6 (1873) 172, non Blume 1825; F.M. Bailey, Queensl. Fl. 5 (1902) 1473; Compr. Cat. Qld. Pl. (1913) 487; Corner, Gard. Bull. Singapore 21 (1965) 81; Blumea 18 (1970) 404.

Ficus novae-hannoverae Engl., Bot. Jahrb. Syst. 7 (1886) 453; Forschungsr. S.M.S. Gazelle 4 (1889) 27; Diels, Bot. Jahrb. Syst. 67 (1935) 202.

Ficus pauper King, Sp. Ficus 2 (1888) 160, t. 204A; Diels, Bot. Jahrb. Syst. 67 (1935) 202.

Ficus chaetophora Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 246; Diels, Bot. Jahrb. Syst. 67 (1935) 201; Summerh., J. Arnold Arbor. 22 (1941) 93. — *Ficus adenosperma* Miq. var. *chaetophora* (Warb.) Corner, Gard. Bull. Singapore 18 (1960) 28.

Ficus thelostoma Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 246; Diels, Bot. Jahrb. Syst. 67 (1935) 201.
Ficus frutescens F.M. Bailey, Queensl. Agr. J. n.s. 1 (1914) 276.
Ficus turbinata Ridl., Trans. Linn. Soc. London, Bot. 9 (1916) 148, non Willd. 1806; Diels, Bot. Jahrb. Syst. 67 (1935) 232.
Ficus trichoneura Summerh., J. Arnold Arbor. 13 (1932) 104, non Diels 1935.
Ficus adenosperma Miq. var. *glabra* Corner, Gard. Bull. Singapore 18 (1960) 28.
Ficus adenosperma Miq. var. *microlepis* Corner, Gard. Bull. Singapore 18 (1960) 28.
Ficus adenosperma Miq. forma *angustifolia* Corner, Gard. Bull. Singapore 18 (1960) 28.
Ficus chaetophora auct. non Warb.: Summerh., J. Arnold Arbor. 22 (1941) 93.

Shrub or tree up to 20 m tall, with spreading branches; latex cream-white (to yellow-brown?). *Leafy twigs* 1.5–3 mm thick, brownish strigose to hirtellous to whitish appressed-puberulous (often only hairy on the nodes) or (sub)glabrous; internodes hollow; periderm usually flaking off. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)ovate to (sub)obovate or to lanceolate (to linear), (1–)5–12(–19) by (0.5–)3–6(–10) cm, (almost) symmetric, chartaceous to subcoriaceous (to coriaceous),

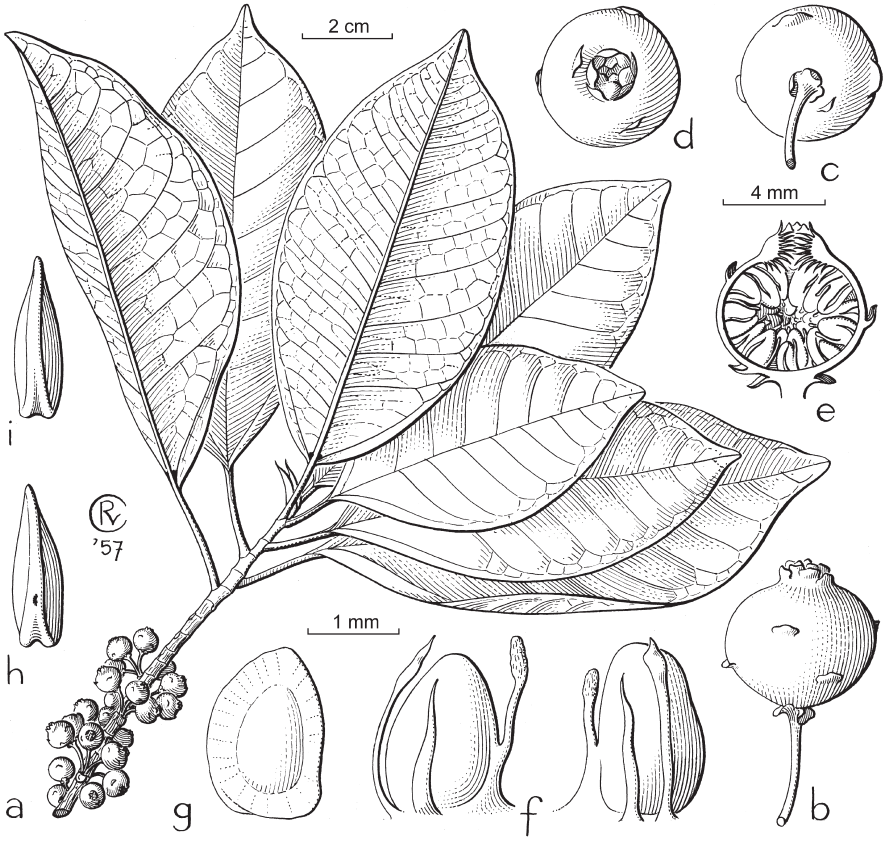


Fig. 60. *Ficus adenosperma* Miq. a. Leafy twig and figs; b–e. figs; f. long-styled flowers; g–i. fruits (all: *Hoogland 4451*).

apex (sub)acuminate to acute to obtuse (to rounded), base rounded to subcordate to cordate or to cuneate, margin entire, sometimes ± revolute; upper surface glabrous, smooth, lower surface strigose to subhirtellous to appressed-puberulous (often only on the main veins or the midrib) or (sub)glabrous; cystoliths on both sides; lateral veins (4–)7–12(–15) pairs, often furcate far from the margin, the basal pairs ± distinct, tertiary venation reticulate to subscalariform (with up to 4 or sometimes 5 intercostals), waxy glands in the axils of the basal lateral veins, usually conspicuous; petiole 0.5–4(–5) cm long, strigose to subhirtellous to appressed-puberulous, the epidermis usually flaking off; stipules 0.5–2.5 cm long strigose to subsericeous or (sub)glabrous, caducous. *Figs* axillary or just below the leaves, in pairs, and/or ramiflorous to cauliflorous and then often more than 2 together below the leaves on spurs, on older branches up to 1 cm long; with a peduncle up to 1 cm long or sometimes sessile; basal bracts 3, verticillate or sometimes ± scattered, 1–1.2 mm long; receptacle subglobose to depressed-globose to subpyriform, 0.4–1.2 cm diam. when dry, 1–1.8 cm diam. when fresh, often up to 0.5(–1) cm long stipitate, with or without lateral bracts, puberulous to hirtellous or (sub)glabrous, (when dry) often ± clearly finely ribbed (or longitudinally veined), greenish-yellow at maturity, apex flat or ± depressed or occasionally protracted, ostiole 2–3 mm diam., flat or ± umbonate; internal hairs few to numerous, whitish or brownish. — **Fig. 60; Map 8.**

Distribution — From Malesia to Australia (Queensland), Solomon Islands, and New Hebrides; in *Malesia*: Celebes, Moluccas (Sula Islands, Tanimbar Islands, Aru Islands), New Guinea.

Habitat — Lowland and montane primary and secondary forest, chiefly along rivers, often in developing thickets on sandbanks and islands, at altitudes up to 2500 m.

Notes — 1. This species is variable in its indumentum and in the shape and dimensions of the lamina. Lateral bracts may be present or absent. The variation led to distinction of some varieties and forms, which can be regarded as extremes of the variation that seems to be continuous rather than discontinuous, with some geographic aspects, as the glabrous morph becoming more common in the eastern part of the species range and the only one found in the Solomon Islands and Queensland.

2. This species is very closely related to *F. comitis*; the latter is distinct in being glabrous, having larger leaves with a distinctly acuminate apex, clearly scalariform tertiary venation (usually with more than 5 intercostals), and the figs often 3–6 together on spurs in the leaf axils and below the leaves.

3. *Ficus adenosperma* shows affinities to both *F. arbuscula* and *F. erythrosperma*. *Ficus arbuscula* is distinct by the distinctly tufted leaves and *F. erythrosperma* by the distinctly scalariform tertiary venation, the lower lateral veins often not being distinctly loop-connected, the basal lateral veins being not or hardly distinct, the relatively short petiole, and the distinctly acuminate lamina apex.

8. Ficus arbuscula Lauterb. & K. Schum.

Ficus arbuscula Lauterb. & K. Schum. in K. Schum. & Lauterb, Fl. Schutzgeb. Südsee (1901) 273; Diels, Bot. Jahrb. Syst. 67 (1935) 203; Corner, Gard. Bull. Singapore 21 (1965) 80.

Ficus charadrophila Summerh., J. Arnold Arbor. 10 (1929) 152; Diels, Bot. Jahrb. Syst. 67 (1935) 203; Summerh., J. Arnold Arbor. 22 (1941) 95.

Shrub up to 3 m tall, spreading with flat-topped crown, with apparent *Terminalia*-branching. *Leafy twigs* 2–4 mm thick, (sub)glabrous, internodes hollow; periderm flaking off. *Leaves* spirally arranged, tufted; lamina oblong to subobovate to (ob)lanceolate, (1.5–)3–11 by (0.5–)1–5 cm, (sub)coriaceous, apex subacute to subacuminate to obtuse, base rounded to cuneate, margin entire; upper surface glabrous or sparsely white hairy, mainly on the midrib and the margin, glabrescent, smooth, lower surface glabrous or sparsely appressed-puberulous on the midrib; cystoliths on both sides; lateral veins 6–13 pairs, the basal pair ± distinct, tertiary venation reticulate to subscalariform (with up to 6 rather obscure intercostals); waxy glands in the axils of the basal lateral veins,

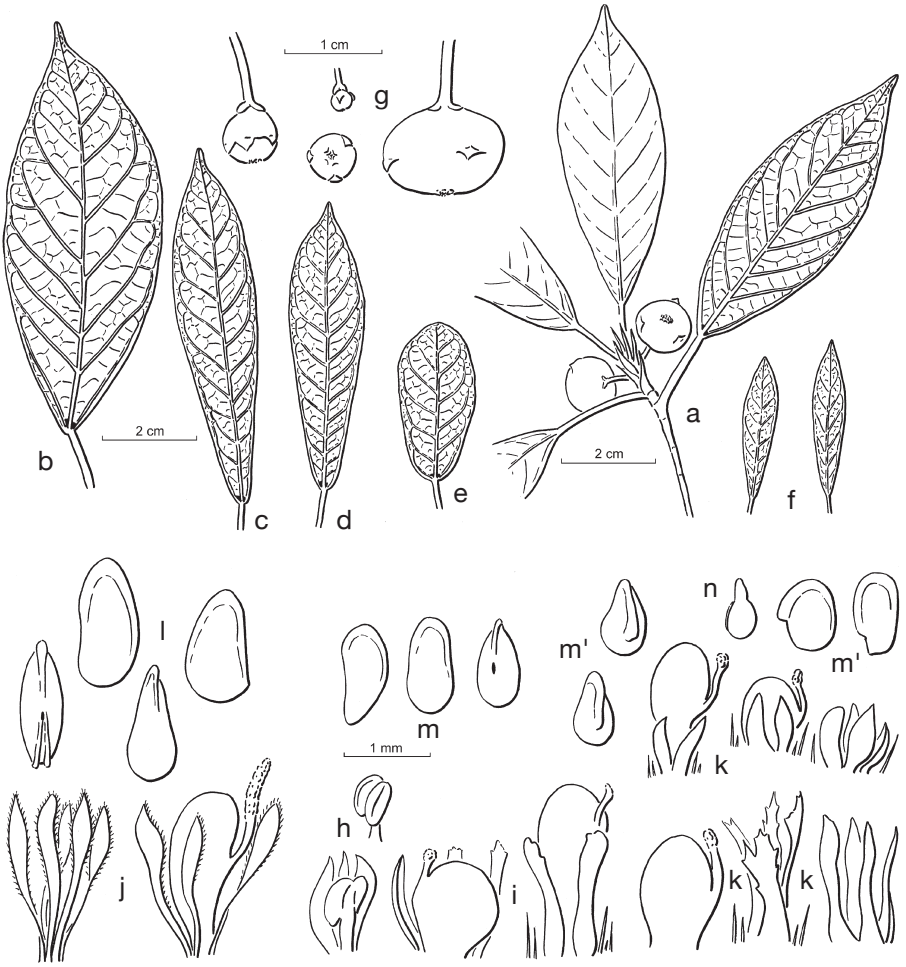


Fig. 61. *Ficus arbuscula* Lauterb. & K. Schum. a. Leafy twig with figs; b–f. leaves; g. figs; h. staminate flower and stamen; i. short-styled flowers; j. long-styled flower and perianth; k. long-styled flowers and perianths; l, m, m'. fruits; n. embryo (a: *NGF 21826*; b: *NGF 26488*; c, m: *Kostermans 869*; d: *Beguin 2075*; e, k, m', n: *Van Leeuwen 10352*; f: *Pulle 122*; g: *Ledermann 8182*; h, i: *Lam 1285*; j, l: *Rodatz & Klink s.n.*). From Philos. Trans., Ser. B, 256 (1969) 340, 341.

often conspicuous; petiole 0.3–3 cm long, glabrous or sparsely minutely puberulous, the epidermis flaking off; stipules 0.5–1.5 cm long, glabrous, subpersistent or caducous. *Figs* axillary, solitary or in pairs, or cauliflorous on up to 2 cm long, ± tuberculate leafless branchlets on the stem; peduncle 0.3–2.3 cm long; basal bracts 3, ± scattered to (almost) verticillate, 1–1.5 mm long; receptacle globose to depressed-globose, 0.8–2.2 cm diam. when dry, 1.5–2.5 cm diam. when fresh, often up to 0.4 cm long stipitate, minutely appressed-puberulous, glabrescent, with several lateral bracts, dull red to brown at maturity, apex convex to ± concave, ostiole 2–3 mm diam., ± umbonate, surrounded by erect apical bracts; internal hairs sparse to abundant white. — **Fig. 61.**

Distribution — *Malesia*: Moluccas (Morotai, Halmahera) and New Guinea.

Habitat — Along rivers and in rocky streambeds, altitudes up to 850 m; flood-persistent, rheophytic, gregarious.

Notes — 1. This species can easily be distinguished from *F. adenosperma* by the tufted leaves, the long and very short internodes of the twigs, and the apparent *Terminalia* mode of branching.

2. The species is quite variable in the dimensions and shape of the leaves and figs.

3. *Ficus arbuscula* resembles *F. verticillaris* from the Solomon Islands; the latter has smaller figs (0.5–0.6 cm diam. when dry) without lateral bracts.

4. Figs axillary and cauliflorous on the same plant.

9. Ficus austrina Corner

Ficus austrina Corner, Gard. Bull. Singapore 18 (1960) 29; 21 (1965) 81.
Ficus moseleyana auct. non King: Summerh., J. Arnold Arbor. 13 (1932) 106.

Tree up to 23 m tall, sometimes buttressed. *Leafy twigs* 3–5 mm thick, glabrous; internodes hollow; periderm flaking off; older twigs with prominent scars of leaves and figs. *Leaves* spirally arranged; lamina (broadly) elliptic to obovate to subobovate or to oblong, 9–24 by 3–15.5 cm, (almost) symmetric, (sub)coriaceous, apex shortly acuminate, base obtuse to rounded to subcordate, margin entire; both surfaces glabrous, smooth; cystoliths only beneath; lateral veins 9–14 pairs, the basal pair slightly or not distinct, tertiary venation scalariform; waxy glands in the axils of the (main) basal lateral veins, conspicuous; petiole (1–)2–4 cm long, glabrous, the epidermis flaking off; stipules 2–4.5 cm long, glabrous, caducous. *Figs* axillary, solitary, with a peduncle up to 1.3 cm long or subsessile; basal bracts 3, (sub)verticillate or scattered, c. 3 mm long, deflexed; receptacle (sub)globose, (1–)1.5–2.5 cm diam. when dry, non-stipitate or up to 0.6 cm long stipitate, glabrous, without lateral bracts, yellowish (?) at maturity, apex ± convex to flat, ostiole c. 4 mm diam., umbonate (or impressed?); internal hairs absent.

Distribution — From Malesia to the Solomon Islands; in *Malesia*: Moluccas (Key Islands) and New Guinea (incl. New Britain).

Habitat — Forest, often along sea-coast (coral-rock, beach), at low altitudes.

10. Ficus casearioides King

Ficus casearioides King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 55, 2 (1887) 403; Sp. Ficus 2 (1889) App. 5, t 228B; Diels, Bot. Jahrb. Syst. 67 (1935) 186; Corner, Gard. Bull. Singapore 21 (1965) 81.

Ficus kingii F. Muell., Descr. Notes Papuan Pl. 2 (1890) 58.
Ficus hylobia Diels, Bot. Jahrb. Syst. 67 (1935) 186; Summerh., J. Arnold Arbor. 22 (1941) 89.
Ficus casearioides King var. *gamosepala* Corner, Gard. Bull. Singapore 18 (1960) 29.

Tree up to 26 m tall. *Leafy twigs* 3–5 mm thick, sparsely (to densely) white (to yellowish) appressed-puberulous or glabrous; internodes solid; periderm flaking off; older twigs with ± prominent scars of leaves and figs. *Leaves* spirally arranged; lamina oblong to subobovate to (ob)lanceolate, (2–)7–18(–21) by (1–)2.5–9 cm, (almost) symmetric, (sub)coriaceous, apex shortly acuminate to subacute (to obtuse), base cuneate to obtuse, margin entire, often ± revolute; upper surface glabrous, smooth, lower surface sparsely white appressed-puberulous on the main veins (and the margin); cystoliths only beneath; lateral veins (4–)10–14 pairs, the basal pair not or hardly distinct, tertiary

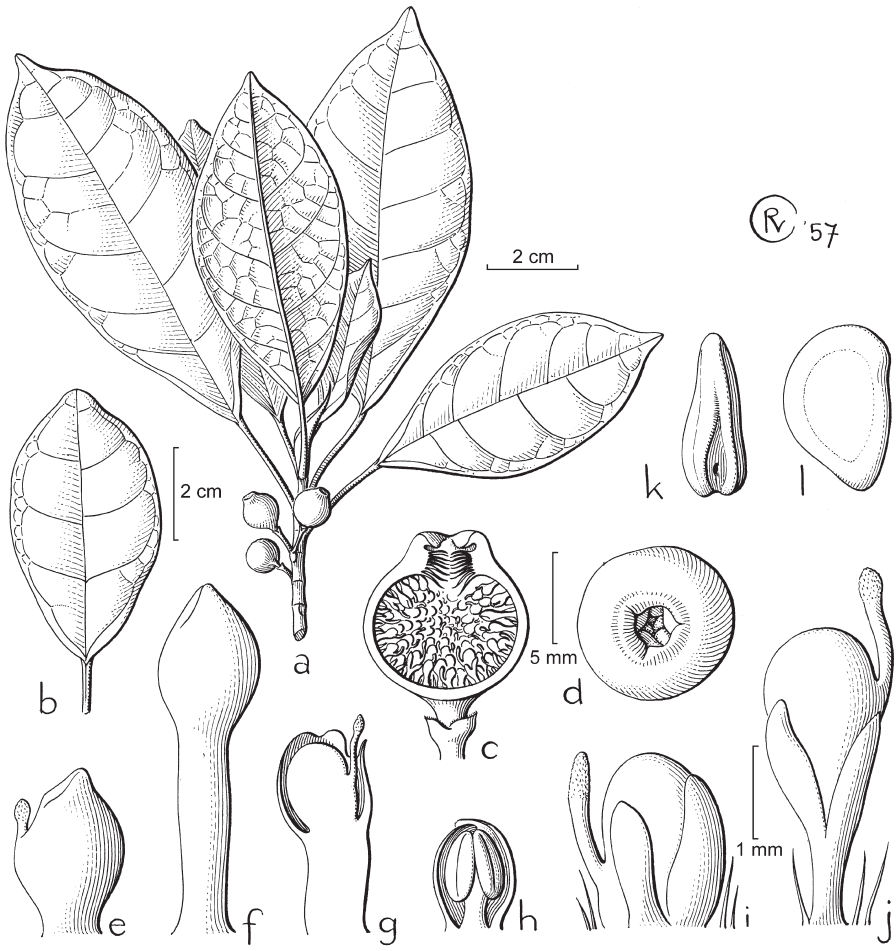
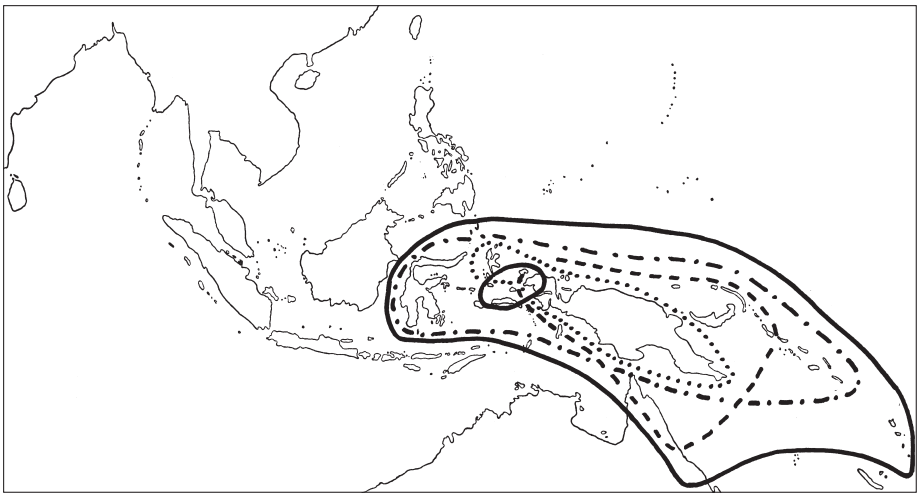


Fig. 62. *Ficus casearioides* King. a. Leafy twig with figs; b. leaf; c. fig; d. ostiole; e–g. short-styled flowers; h. staminate flower; i, j. long-styled flowers; k, l. fruits (a, c–h: *Carr 13179*; b: *Carr 14548*; i–l: *Clemens 1350*).



Map 8. Distribution of some species of subg. *Sycomorus* sect. *Adenosperma*: *F. adenosperma* Miq. (continuous line, outer); *F. casearioides* King (dotted line); *F. erythrosperma* Miq. (dot-dash line); *F. mollior* F. Muell. ex Benth. (broken line); *F. umbonata* Reinw. ex Blume (continuous line, inner).

venation scalariform; waxy glands in the axils of the basal lateral veins, conspicuous (rarely inconspicuous or absent); petiole 0.5–2(–4.5) cm long, appressed-puberulous, the epidermis flaking off; stipules 1–2 cm long, (sub)glabrous or partly yellowish appressed-puberulous, caducous. *Figs* axillary or just below the leaves, solitary or in pairs, or occasionally cauliflorous on up to 2 cm long branchlets on the trunk; peduncle 0.7–2 cm long; basal bracts 3, (sub)verticillate or ± scattered, c. 1 mm long; receptacle (sub)globose (to ovoid), 0.9–1.2(–1.6) cm diam. when dry, 1–2 cm diam. when fresh, non-stipitate or up to 0.2 cm long stipitate, sparsely white appressed-puberulous, without lateral bracts, yellowish (?) at maturity, apex ± convex to flat, ostiole c. 2(–4) mm diam., ± umbonate; internal hairs abundant, sparse, or absent. *Perianth* of pistillate flowers sometimes rather extensively connate. — **Fig. 62; Map 8.**

Distribution — *Malesia*: Moluccas (Bacan Island, Morotai, Ternate), New Guinea.

Habitat — Forest, at altitudes up to 2300 m.

Note — The species is occasionally cauliflorous (*Polak 1119*, from New Guinea, E of Ayawasi).

11. **Ficus comitis** King

Ficus comitis King, Sp. Ficus 2 (1888) 156, t. 197; Diels, Bot. Jahrb. Syst. 67 (1935) 205; Corner, Gard. Bull. Singapore 21 (1975) 80.

Ficus nuruensis Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 249.

Tree up to 18 m tall; latex white to yellow. *Leafy twigs* 2–3.5 mm thick, glabrous; internodes hollow; periderm ± flaking off. *Leaves* spirally arranged; lamina elliptic, (7–)10–21(–28) by (3–)5.5–10(–14) cm, (almost) symmetric, subcoriaceous, apex (abruptly) acuminate, base subcuneate to subattenuate, margin entire; upper surface

glabrous, smooth, lower surface glabrous or sparsely minutely appressed-puberulous, glabrescent; cystoliths on both sides; lateral veins (8–)10–13 pairs, often furcate far from the margin, the basal pairs ± to hardly distinct, tertiary venation (sub)scalariform (with 6–9 intercostals); waxy glands in the axils of the basal lateral veins, ± conspicuous; petiole 2–6.5(–11) cm long, glabrous; stipules 1.2–2.7 cm long, glabrous, caducous. *Figs* axillary, in pairs, or more often 3–6 together on short spurs in the leaf axils and/or below the leaves (to ramiflorous?); peduncle 0.2–0.6 cm long; basal bracts 3, verticillate or ± scattered, 1–1.5 mm long; receptacle subglobose, 0.6–0.8 cm diam. when dry, up to 0.4 cm long stipitate, sparsely puberulous, glabrescent, with or without lateral bracts, greenish at maturity, apex flat to ± convex, ostiole 0.2–0.3 mm diam., ± umbonate; internal hairs abundant, white to brownish.

Distribution — *Malesia*: New Guinea.

Habitat — Forest and secondary growth, often along rivers. Altitudes up to 1150 m.

Note — This species is closely related to *F. adenosperma*, as discussed under the latter. The differences suggest a subspecific rank rather than a specific one.

12. **Ficus endochaete** Summerh.

Ficus endochaete Summerh., J. Arnold Arbor. 22 (1941) 94; Corner, Gard. Bull. Singapore 21 (1965) 80.

Tree up to 15 m tall. *Leafy twigs* 1.5–2.5 mm thick, ribbed; internodes solid; periderm persistent. *Leaves* distichous; lamina lanceolate (to oblong), (2.5–)7–15 by (0.5–)1.5–4 cm, ± asymmetric, (sub)coriaceous, apex acuminate to subcaudate, base rounded

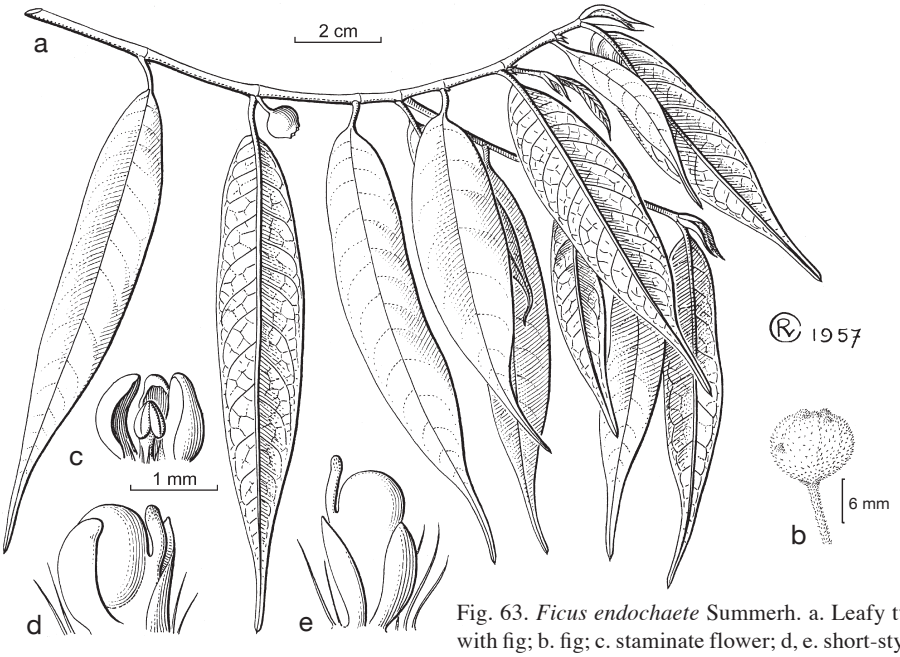


Fig. 63. *Ficus endochaete* Summerh. a. Leafy twig with fig; b. fig; c. staminate flower; d, e. short-styled flowers (all: *NGF 5136*).

at one side, cuneate at the other, margin entire; upper surface whitish to yellowish sericeous, glabrescent, smooth, lower surface yellowish to brown subsericeous to subhirsute or partly tomentose on the veins, also minute brown pluricellular trichomes; cystoliths on both sides; lateral veins (7–)10–17 pairs, the basal pair not distinct, tertiary venation reticulate to subscalariform; waxy glands in the axils of the basal lateral veins at the narrow side of the lamina base; petiole 0.3–1(–1.5) cm long, subhirtellous to strigillose, the epidermis flaking off; stipules 1–2 cm long, (partly) yellow to brownish (sub)sericeous, caducous. *Figs* axillary, solitary or in pairs; peduncle 1–1.5(–2.1) cm long; basal bracts 3, c. 1.5 mm long, verticillate or ± scattered; receptacle subglobose, 0.8–1.2 cm diam. when dry, up to 0.4 cm long stipitate or non-stipitate, subtomentose, with up to 5 lateral bracts or without, at maturity yellowish, apex ± crateriform, ostiole c. 2.5 mm diam., surrounded by 5 erect, ± cushion-shaped apical bracts; internal hairs abundant, brownish. — **Fig. 63.**

Distribution — *Malesia*: New Guinea.

Habitat — *Nothofagus*-forest, at altitudes between 1800 and 2900 m.

13. Ficus erythrosperma Miq.

Ficus erythrosperma Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 226, 293; King, Sp. Ficus 2 (1888) 181; Corner, Gard. Bull. Singapore 18 (1960) 31; 21 (1965) 82.

Ficus pycnoneura Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 275; Diels, Bot. Jahrb. Syst. 67 (1935) 187; Summerh., J. Arnold Arbor. 22 (1941) 93.

Ficus lachnocarpa Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 243; Diels, Bot. Jahrb. Syst. 67 (1935) 187.

Ficus xanthoxyla Summerh., J. Arnold Arbor. 10 (1929) 154; Diels, Bot. Jahrb. Syst. 67 (1935) 230; Summerh., J. Arnold Arbor. 22 (1941) 93.

Ficus tenella Corner, Gard. Bull. Singapore 18 (1960) 30.

Tree up to 28 m tall, becoming (up to 3 m high) buttressed. *Leafy twigs* 1.5–3 mm thick, (minutely) puberulous to tomentellous and pale brown subsericeous to subvillous (or to subhirsute); internodes solid; periderm (usually) flaking off. *Leaves* spirally arranged (to subdistichous); lamina subobovate to oblong (to lanceolate or to elliptic), (1.5–)6–19 by (0.5–)2.5–8.5 cm, ± asymmetric to symmetric, subcoriaceous, apex acuminate to (sub)caudate, base cuneate to obtuse, margin entire; upper surface glabrous, smooth, lower surface sparsely to rather densely pale brown (sub)sericeous on the main veins, smaller veins usually glabrous; cystoliths only beneath; lateral veins (7–)10–14 pairs, the basal pair not distinct, tertiary venation scalariform (in small leaves to almost reticulate); waxy glands absent; petiole (0.3–)0.5–2.6 cm long, puberulous to tomentellous and (sub)sericeous to subvillous (or to subhirsute), the epidermis flaking off; stipules (0.5–)1–2.5 cm long, densely to (very) sparsely brown, subvillous to subsericeous, at least one of the pairs on the whole surface to only on the keel, the other glabrous or only hairy at the base, caducous. *Figs* axillary or just below the leaves, solitary or in pairs, sometimes also ramiflorous, up to 6 together on up to 0.3 cm long spurs, with a peduncle 0.1–1 cm long, rarely sessile; basal bracts 3, (sub)verticillate or scattered, c. 1.5 mm long; receptacle (sub)globose (to subpyriform), 0.4–1.2 cm diam. when dry, 0.6–1.8 cm diam. when fresh, non-stipitate or up to 0.5(–1) cm long stipitate,

mostly sparsely, sometimes densely pale brown appressed-puberulous to tomentose and glabrescent or subglabrous, with some lateral bracts (or none), greenish (?) at maturity, apex ± convex to flat, ostiole 1.5–2.5 mm diam., flat to slightly umbonate or slightly impressed, surrounded by 5–7 small, ± erect apical bracts or not; internal hairs copious, whitish or yellowish. — **Map 8.**

Distribution — From Malesia to the Solomon Islands; in *Malesia*: Celebes, Moluccas (Bacan, Ternate, Ceram, Ambon and Key Islands) and New Guinea (incl. New Britain).

Habitat — Forest and secondary growth, often along streams, at altitudes up to c. 2250 m.

Notes — 1. A form with subpersistent stipules (from Papua New Guinea) has been described as *F. tenella*; the few collections showing this feature are included in *F. erythrosperma*.

2. This species is closely related to *F. trichocerasa* and *F. pilulifera* from which it can be distinguished by the indumentum of the lower leaf surface, being (almost) confined to the midrib and the lateral veins and consisting of pale brown (almost) straight hairs of similar length.

14. Ficus funiculosa Corner

Ficus funiculosa Corner, Gard. Bull. Singapore 18 (1960) 30; 21 (1965) 81.
Ficus trichoneura Diels var. *lachnocarpa* Diels, Bot. Jahrb. Syst. 67 (1935) 230.

Tree up to 25(–35) m tall, becoming up to 1.5 m high buttressed. *Leafy twigs* 2.5–6 mm thick, densely pale brown tomentose; internodes hollow; periderm flaking off. *Leaves* spirally arranged; lamina elliptic to oblong (to subcordiform), 8–23 by 4.5–18 cm, (almost) symmetric, subcoriaceous (to chartaceous), apex acuminate, base obtuse to (sub)cordate, margin entire; upper surface (sub)glabrous or sparsely hairy at the base of the lamina, smooth, lower surface ± densely pale brown tomentose on the veins; cystoliths only beneath; lateral veins 9–14 pairs, often some of them furcate far from the margin, the basal pair not or somewhat distinct, tertiary venation scalariform, ± prominent beneath; waxy glands in the axils of one of the basal lateral veins (conspicuous or inconspicuous) and often also smaller ones in furcations of the lateral veins; petiole 1.5–4.5 cm long, pale brown tomentose, the epidermis flaking off; stipules 1–2 cm long, partly pale brown tomentose to appressed-puberulous, caducous. *Figs* axillary, solitary (or in pairs); peduncle 0.4–1.6 cm long, tomentose; basal bracts 2 or 3, ± scattered or (sub)verticillate, c. 2.5 mm long; receptacle depressed-globose to subpyriform, 1.8–3 cm diam. when dry, 2.5–4.5 cm diam. when fresh, non-stipitate, densely pale brown tomentose, with a few lateral bracts, at maturity greenish (?), apex ± convex to flat, ostiole 3–4.5 mm diam., umbonate; internal hairs copious, whitish or yellowish. — **Fig. 64.**

Distribution — *Malesia*: Moluccas (Bacan), New Guinea (incl. New Britain).

Habitat — Forest, at altitudes up to 1200 m.

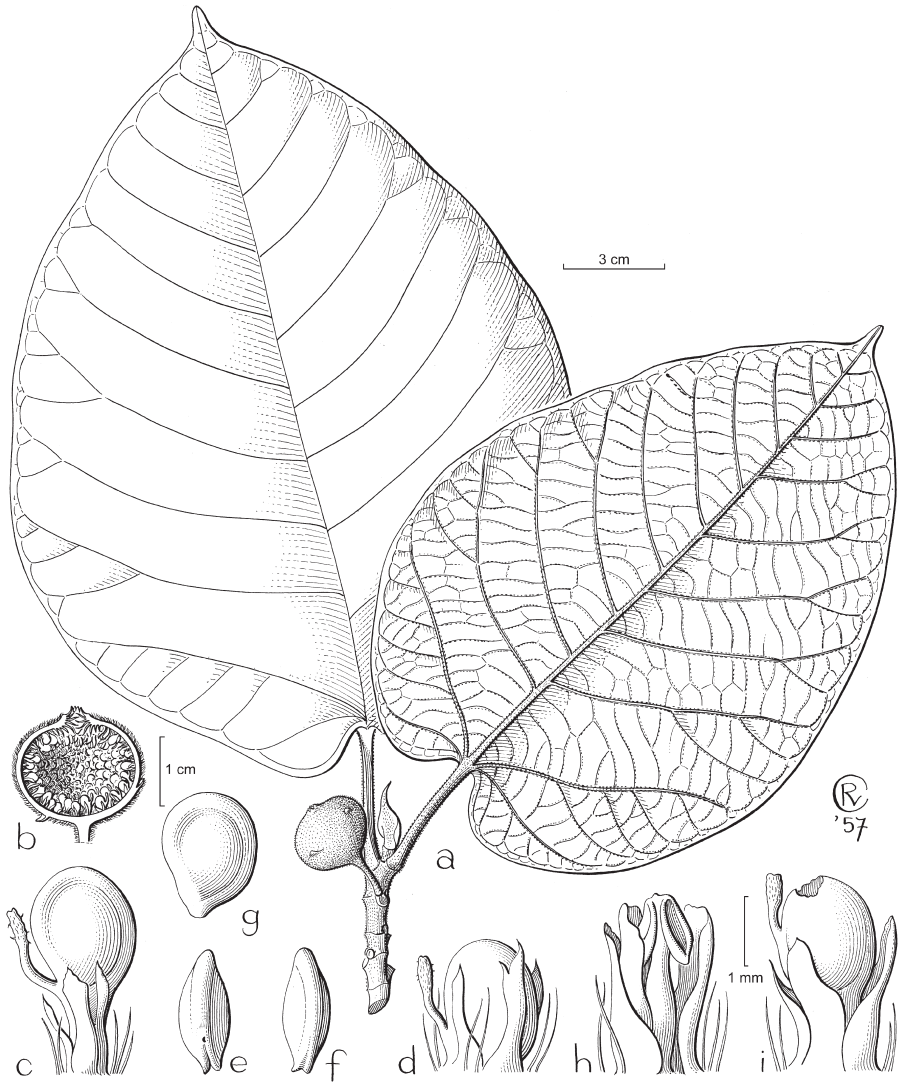


Fig. 64. *Ficus funiculosa* Corner. a. Leafy twig with fig; b. fig; c, d. long-styled flowers; e–g. fruits; h. staminate flower; i. short-styled flower with opened 'gall-fruit' (a, h, i: *Brass 15321*; b–g: *NGF 7031*).

15. **Ficus megalophylla** Diels

Ficus megalophylla Diels, Bot. Jahrb. Syst. 67 (1935) 204; Corner, Gard. Bull. Singapore 21 (1965) 79.

Treelet up to 8 m tall, sparingly branched. *Leafy twigs* 7–12 mm thick, brown hirtellous to subtomentose; internodes hollow; periderm flaking off. *Leaves* spirally arranged, ± tufted; lamina elliptic to obovate, 25–45 by 12–15 cm, symmetric, coriaceous, apex

(shortly) acuminate, base subcordate to subcuneate, margin entire; upper surface glabrous, smooth, lower surface hirtellous to puberulous on the veins; cystoliths on both sides; lateral veins 7–16 pairs, some of them furcate far from the margin, the basal pair not or hardly distinct, tertiary venation scalariform; waxy glands in the axils of the (main) basal lateral veins and in the furcations of the lateral veins; petiole 2–6 cm long, hirtellous to strigose, the epidermis flaking off; stipules 3–5 cm long, ovate, apiculate, glabrous, (sub)persistent. *Figs* axillary, in pairs, sessile; basal bracts 3 or 4, 8–14 mm long, coriaceous; receptacle depressed-globose, 2–2.3 cm diam. when dry, brown (sub)tomentose, with some lateral bracts, purplish (?) at maturity, apex ± convex, ostiole c. 5 mm diam., surrounded by 'a crown' of apical bracts; internal hairs abundant to sparse, whitish.

Distribution — *Malesia*: New Guinea (eastern).

Habitat — Montane forest, often along streams. Altitudes between 900 and 1900 m.

Note — This species is probably closely related to *F. saccata*.

16. Ficus mollior F. Muell. ex Benth.

Ficus mollior F. Muell. ex Benth., Fl. Austral. 6 (1873) 173; F.M. Bailey, Queensl. Fl. 5 (1902) 1475; Compr. Cat. Qld. Pl. (1913) 487; Corner, Gard. Bull. Singapore 21 (1965) 80.

Ficus gazellae Engl., Bot. Jahrb. Syst. 7 (1886) 452; Diels, Bot. Jahrb. Syst. 67 (1935) 197.

Ficus chrysolaena K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 279; G. Karst. & Schenck, Vegetationsbilder 6 (1908) t. 12.

Ficus dielsii Warb., Feddes Repert. Spec. Nov. Regni Veg. 1 (1905) 75.

Ficus ochrochlora Ridl., Trans. Linn. Soc. London, Bot. 9 (1916) 148; Diels, Bot. Jahrb. Syst. 67 (1935) 232; Summerh., J. Arnold Arbor. 22 (1941) 90, 91.

Ficus stelechosycia Diels, Bot. Jahrb. Syst. 67 (1935) 212. — *Ficus mollior* F. Muell. ex Benth. var. *pseudocovellia* Corner, Gard. Bull. Singapore 18 (1960) 27.

Ficus mollior F. Muell. ex Benth. var. *sessilis* Corner, Gard. Bull. Singapore 18 (1960) 27.

Ficus mollior F. Muell. ex Benth. forma *riparia* Corner, Gard. Bull. Singapore 18 (1960) 27.

Ficus spadicea Corner, Blumea 20 (1972) 429, t. 2.

Tree up to 25 m tall; latex white or yellowish(-cream). *Leafy twigs* 2–4 mm thick, pale to dark brown villous to hirsute to subtomentose; internodes hollow; periderm flaking off. *Leaves* spirally arranged (to subdistichous); lamina (broadly) elliptic to ovate to subobovate to subpandurate or to oblong, (3–)10–23 by (1–)5–15 cm, symmetric, subcoriaceous, apex acuminate to subacute (or to subcaudate), base cordate to cuneate, margin entire; upper surface sparsely brownish villous and glabrescent or glabrous, smooth, lower surface pale to dark brown villous to subsericeous to hirsute to hirtellous on the veins; cystoliths on both sides; lateral veins (4–)6–10(–11) pairs, often furcate far from the margin, the basal pair ± distinct or not, tertiary venation scalariform (with more than 5 intercostals), often ± prominent; waxy glands in the axils of the basal lateral veins, ± conspicuous; petiole 1–7 cm long, pale to dark brown (sub)villous to (sub)hirsute to hirtellous, the epidermis flaking off; stipules 0.5–1.5(–2.5) cm long, strigose to subhirsute, towards the margin minutely puberulous or glabrous, caducous (or subpersistent). *Figs* axillary or just below the leaves, solitary, in pairs or up to 7 together on short spurs, or also or only (?) cauliflorous on clusters of up to 3 cm long leafless branchlets on the trunk (and main branches?), with a peduncle up to 1.5(–2) cm long or (sub)sessile; basal bracts 3(–5), usually verticillate, sometimes ± scattered,

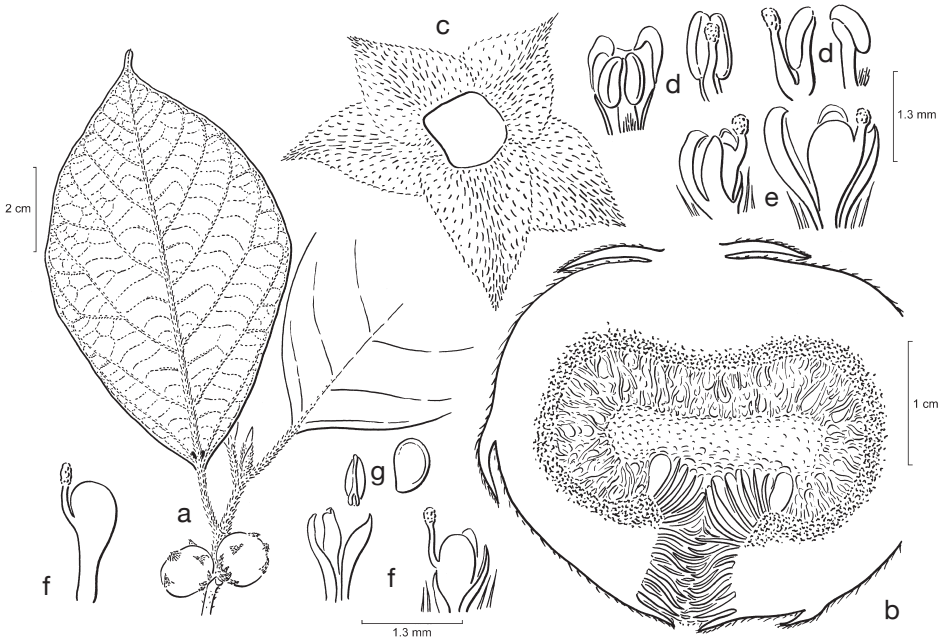


Fig. 65. *Ficus mollior* F. Muell. ex Benth. a. Leafy twig with figs; b. fig; c. basal bracts; d. staminate flowers, stamen and pistillodes; e. short-styled flowers; f. long-styled flower, perianth and pistil; g. fruits (a–e: *Carr 12946*; f, g: *Boden Kloss s.n.*). From Philos. Trans., Ser. B, 256 (1969) 334.

1–3.5 mm long; receptacle subglobose to subpyriform to ovoid or to depressed-globose, (0.5–)0.8–2.2 cm diam. when dry, (1–)1.5–2.5 cm diam. when fresh, pale to dark brown short-villous to subtomentose to hirtellous, often glabrescent, only the lateral bracts appressed-puberulous or glabrous, with several lateral bracts, yellowish at maturity, apex ± convex to flat or ± concave, ostiole 2–4 mm diam., ± umbonate; internal bristles whitish or yellowish. *Staminate flowers* sometimes with pistillodes. — **Fig. 65; Map 8.**

Distribution — From Malesia to Australia (Queensland) and the Solomon Islands; in *Malesia*: New Guinea (incl. New Britain and New Ireland).

Habitat — Forest and secondary growth, often along rivers, also behind mangrove, at altitudes up to 2200 m.

Notes — 1. This species is quite variable, showing the same type of variation as *F. adenosperma*. The infraspecific taxa which have been recognized also appear to represent extremes of ± continuous variation. This also includes the dimensions of the fig receptacle and the length of the peduncle and, therewith, the material recognized by its relatively large and sessile figs as *F. ochrochlora*. The indumentum varies from pale brown to dark brown (as in the type material of *F. spadicea*) and from soft and ± crinkled hairs to stiff and straight hairs.

2. A form from the Solomon Islands resembles very much *F. comitis* in its small, usually stipitate fig receptacles and the dimensions of the lamina, but it is distinct in lacking the ± abruptly acuminate apex of the lamina and having hairy leafy twigs.

3. *Ficus mollior* can be distinguished from *F. adenosperma* by the clearly scalariform tertiary venation (with more than 5 intercostals), but in specimens with relatively small leaves and fig receptacle and with sparse indumentum, often only just.

4. According to Corner (1965: 80), the species is also found in the Moluccas (Ambon), but no specimens were found in L.

17. **Ficus pilulifera** Corner

Ficus pilulifera Corner, Philos. Trans., Ser. B, 256 (1969) 345.
Ficus trichocerasa Diels var. *glabristipula* Corner, Gard. Bull. Singapore 18 (1960) 31.
Ficus servula Corner, Blumea 18 (1970) 405, t. 8.

Tree up to 12 m tall. *Leafy twigs* 2.5–4 mm thick, whitish puberulous and also white (sub)sericeous; internodes solid or hollow; periderm flaking off (or only below the leaves). *Leaves* spirally arranged; lamina oblong to elliptic to subpanduriform or to lanceolate, (5–)9–25 by (2–)3.5–10 cm, slightly asymmetric, subcoriaceous, apex acuminate, base rounded and emarginate, margin entire, towards the base often slightly revolute; upper surface sparsely pilose, soon glabrous, smooth, lower surface (rather) sparsely whitish puberulous to subtomentose on the veins, on the main veins also (sub)sericeous; cystoliths only beneath; lateral veins 9–13 pairs, mostly one or some

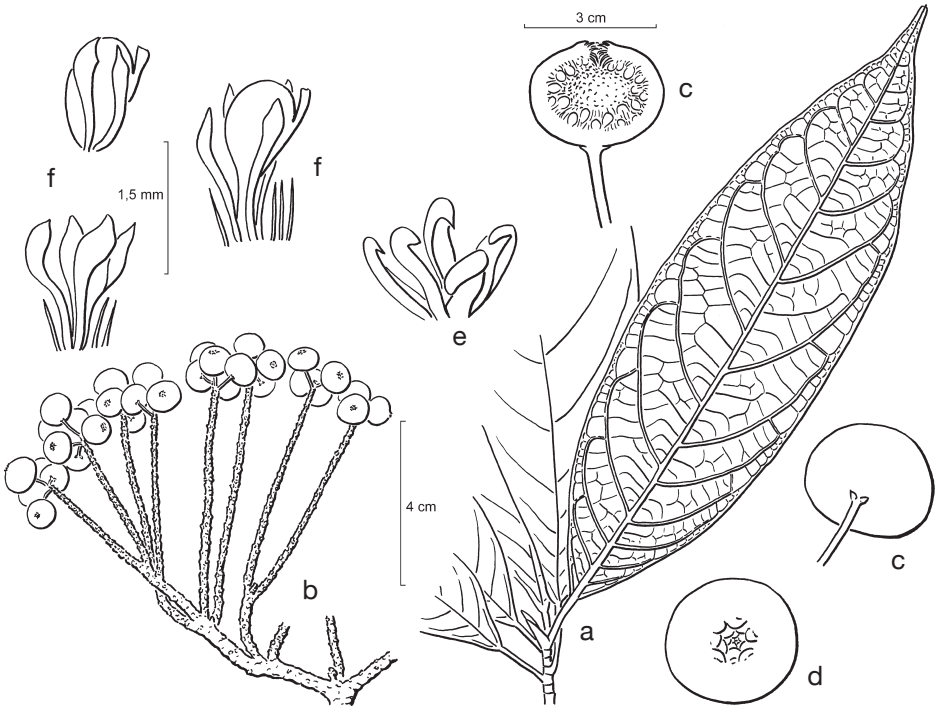


Fig. 66. *Ficus pilulifera* Corner. a. Leafy twig; b. fig-bearing branchlets; c. figs; d. ostiole; e. staminate flower; f. short-styled flowers and perianth (all: *Hartley 11096*). From Philos. Trans., Ser. B, 256 (1969) 346.

of them furcate far from the margin, the lower ones not distinctly loop-connected, the basal pair slightly distinct, tertiary venation loosely scalariform, ± prominent beneath; waxy glands in the axils of one of the basal lateral veins (conspicuous or inconspicuous) and often also smaller ones in furcations of the lateral veins; petiole 0.7–2(–4) cm long, whitish puberulous and also (sub)sericeous, the epidermis flaking off; stipules 0.5–1.7 cm long, sparsely sericeous, often only at the base or on the keel, or only ciliolate on the margin, caducous or subpersistent. *Figs* axillary, solitary or in pairs, or cauliflorous on up to 15 cm long, branched leafless branchlets down to the base of the trunk; peduncle 0.1–0.7 cm long; basal bracts 3, verticillate, 1–2.5 mm long; receptacle (sub)globose, 0.6–1.2 cm diam. when dry, non-stipitate or up to 0.1 cm long stipitate, (rather) sparsely whitish puberulous to subtomentose to subglabrous, without lateral bracts, reddish green or brownish (?) at maturity, apex ± convex to flat with short ribs towards the ostiole, ostiole 2–2.5 mm diam., ± umbonate; internal hairs sparse, yellowish or whitish. — **Fig. 66.**

Distribution — *Malesia*: New Guinea.

Habitat — Forest, at altitudes up to c. 1300 m.

Note — This species resembles *F. subcuneata* in the subcordate to emarginate base of the lamina, but can be distinguished by the whitish long appressed hairs intermixed with very short hairs on the midrib beneath and on the petiole and the sparsely hairy to subglabrous, relatively small stipules.

18. Ficus saccata Corner

Ficus saccata Corner, Gard. Bull. Singapore 18 (1960) 26; 21 (1965) 79.

Treelets up to 6 m tall, sparingly branched, first (and second) node of (lateral) branches only with stipules. *Leafy twigs* 5–8 mm thick, glabrous or hirtellous; internodes hollow; periderm flaking off. *Leaves* spirally arranged, often ± tufted; lamina subpandurate to (sub)obovate or to oblanceolate, (5–)25–36 by (3–)11–15 cm, symmetric, (sub)coriaceous, (shortly) acuminate (or rounded), base cordate, margin entire; upper surface glabrous, lower surface subglabrous (with minute pluricellular trichomes mainly on the veins); cystoliths on both sides; lateral veins 9–14 pairs, most of them furcate far from the margin, basal ones slightly or hardly distinct, tertiary venation (sub)scalariform to almost reticulate (in small leaves); waxy glands in the axils of one or both (main) basal veins and in the furcations of the lateral veins; petiole (1–)2–5 cm long, glabrous or hirtellous, the epidermis flaking off; stipules (1–)1.5–6 cm long, ovate-saccate, apiculate, (sub)persistent. *Figs* axillary, in pairs, sessile; basal bracts 3 or 4, ± scattered, 5–7 mm long, coriaceous; receptacle subglobose, c. 2 cm diam. when dry, 3–3.5 cm diam. when fresh, brownish subtomentose, with some lateral bracts, yellowish (?) at maturity, apex ± convex, ostiole 4–7 mm diam., ± umbonate; internal bristles abundant to sparse, brownish. — **Fig. 67.**

Distribution — *Malesia*: New Guinea.

Habitat — Montane forest, at altitudes between (1000–)1300 and 2800 m.

Note — This species resembles *F. megalophylla* and can be distinguished from the latter by the (sub)glabrous lower surface and the lamina and the absence of (the tuft of) recurved bracts around the ostiole.

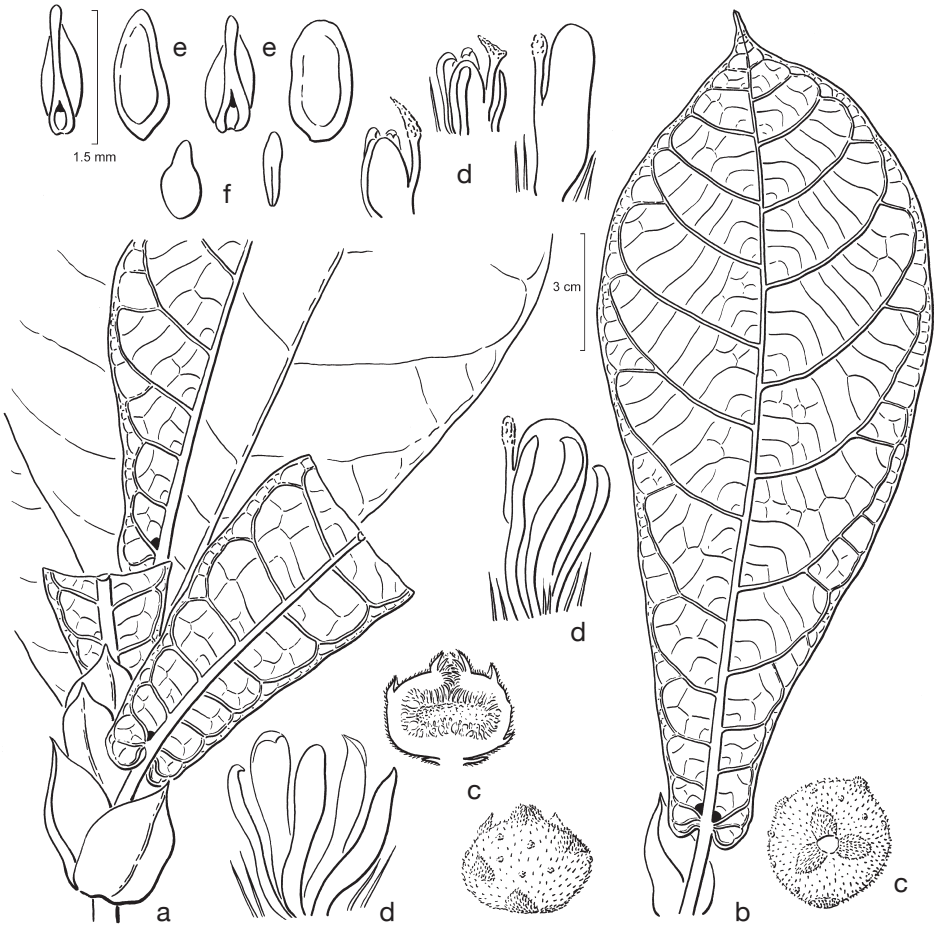


Fig. 67. *Ficus saccata* Corner. a. Leafy twig; b. leaf and stipules; c. figs; d. long-styled flowers; e. fruits; f. embryos (a: *NGF 12450*; b–f: *Carr 14063*). From Philos. Trans., Ser. B, 256 (1969) 330.

19. **Ficus subcuneata** Miq.

Ficus subcuneata Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 235, 297; King, Sp. Ficus 2 (1888) 184; Corner, Gard. Bull. Singapore 18 (1960) 30; 21 (1965) 81; Blumea 18 (1970) 404.
Ficus stoechotricha Diels, Bot. Jahrb. Syst. 67 (1935) 225.
Ficus trichoneura Diels, Bot. Jahrb. Syst. 67 (1935) 230, non Summerh. 1932.
?*Ficus trichoneura* Diels var. *latifolia* Diels, Bot. Jahrb. Syst. 67 (1935) 230.
Ficus formosa Summerh., J. Arnold Arbor. 22 (1941) 97.

Tree up to 30 m tall, sometimes with buttresses up to 60 cm high. *Leafy twigs* 2.5–4 mm thick, densely pale brown (sub)hirsute; internodes hollow; periderm mostly persistent but flaking off below the leaves. *Leaves* spirally arranged (to subdistichous); lamina subobovate to oblong or to elliptic (or to subpandurate), (6–)10–20 by (2.5–)3–9 cm, symmetric to slightly asymmetric, subcoriaceous to chartaceous, apex acuminate (to

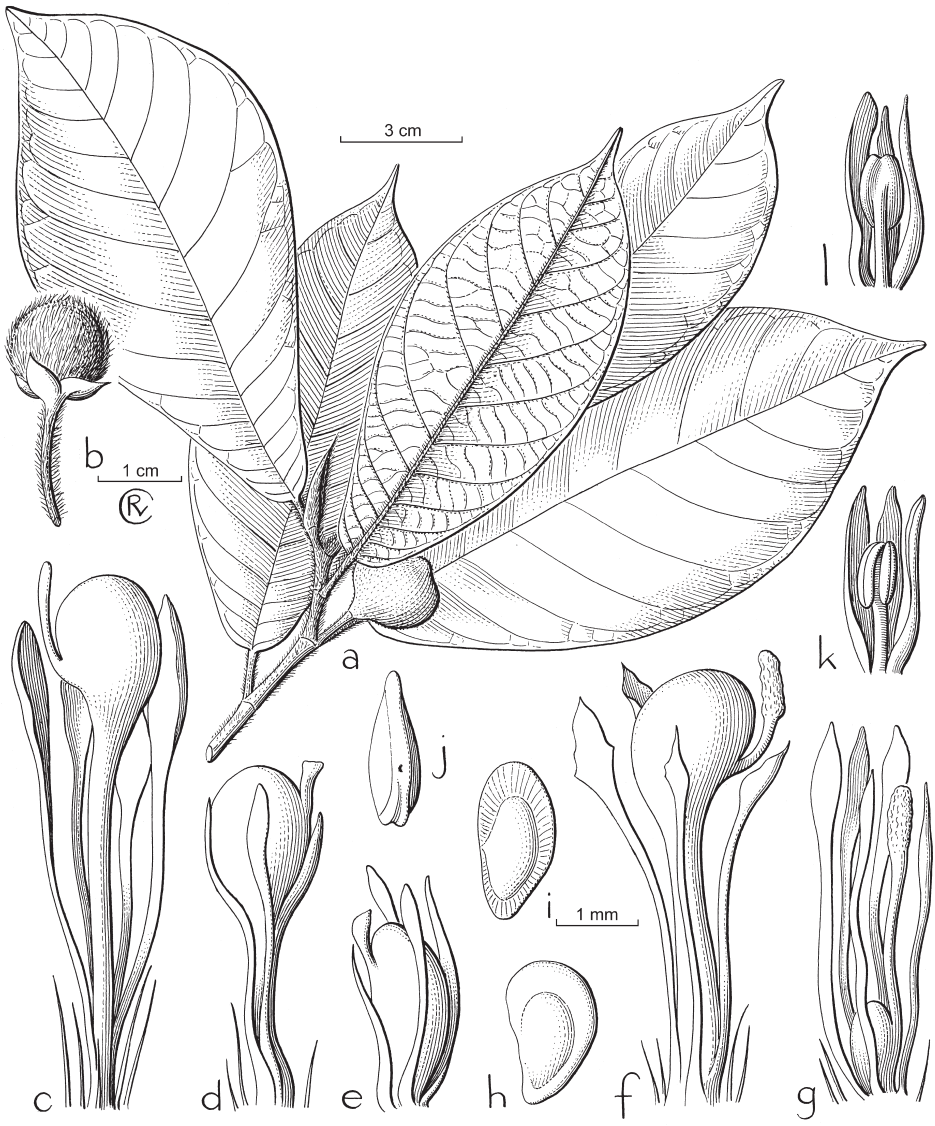


Fig. 68. *Ficus subcuneata* Miq. a. Leafy twig with fig; b. fig; c, f, g. long-styled flowers; d, e. short-styled flowers; h–j. fruits; k, l. staminate flowers (a: *Hoogland 4523*; b: *Hoogland 3949*; c, h–j: *Clemens 3270;* d, e, k, l: *Kostermans 1409*; f, g: *Carr 16314*).

subcaudate), base subcordate or (obtuse and) emarginate, margin entire; upper surface sparsely, at least in the lower half of the midrib densely, pale brown hirtellous, smooth, lower surface ± densely pale brown hirtellous to subtomentose on the main veins; cystoliths only beneath; lateral veins 9–16 pairs, often most or some of them furcate far from the margin, the lower lateral veins often not distinctly loop-connected, the basal pair slightly distinct, tertiary venation scalariform; waxy glands in the axils of one or

both of the basal lateral veins (conspicuous or inconspicuous) and often also smaller ones in furcations of the lateral veins; petiole 0.5–1.5(–2) cm long, pale brown hirtellous to hirsute, the epidermis persistent; stipules 1–2.5 cm long, (rather) densely pale brown to yellowish hirsute to hirtellous (to subvillous), caducous. *Figs* axillary or just below the leaves, solitary (or in pairs) (or also cauliflorous?); peduncle 0.4–2.5 cm long; basal bracts 3, (sub)verticillate, 5–6 mm long and early caducous or c. 2.5 mm long and not early caducous; receptacle depressed-globose to subpyriform, 1.8–2.5(–3) or c. 1.3 cm diam. when dry, 2–3.5(–5) cm diam. when fresh, up to 1(–1.5) cm long stipitate, ± densely (especially towards the base and around the ostiole) to sparsely (if so, then especially in the middle part) yellowish to whitish subvillous to subhirsute to hirtellous, ± distinctly ribbed, without lateral bracts, yellowish (?) at maturity, apex ± convex to flat (or concave), ostiole (3–)4–5 mm diam., umbonate or flat; internal hairs copious, whitish or yellowish. — **Fig. 68.**

Distribution — *Malesia*: Moluccas (Morotai, Ceram) and New Guinea (incl. New Britain).

Habitat — Forest, at altitudes up to 1200 m.

Notes — 1. The figs appears to be normally borne in the leaf axils, but they may be cauliflorous on the trunk and branches (according to label data of *Millar NGF 40819*).

2. The material from the Moluccas (two collections examined: *Kostermans 1409* and *Kato et al. 7668*) differs from the (numerous) other collections in the smaller fig receptacles (when dry c. 1.3 cm diam.) and the smaller (c. 2.5 mm long) basal bracts, not early caducous, but subpersistent.

3. This species differs from *F. trichocerasa* in, e.g., the presence of hairs on (at least the lower half of) the midrib above and the caducous basal bracts.

20. Ficus suffruticosa Corner

Ficus suffruticosa Corner, Philos. Trans., Ser. B, 256 (1969) 348, t. 25.

Shrub 1 m high. *Leafy twigs* 1.5–2.5 mm thick, pale brown subtomentose to hirtellous; internodes solid; periderm persistent, flaking off below the leaves. *Leaves* (sub)distichous; lamina oblong to lanceolate, 15–17 by 4.5–6 cm, (almost) symmetric, chartaceous, apex acuminate, base rounded to subtruncate, margin entire; upper surface, sparsely, on the midrib densely puberulous, smooth, lower surface hirtellous to subtomentose to puberulous on the veins; cystoliths only beneath; lateral veins 12–15 pairs, the basal pair not distinct, tertiary venation scalariform; waxy glands absent; petiole 0.8–1.3 cm long, hirtellous to subtomentose, the epidermis persistent; stipules 1.2–1.5 cm long, partly subsericeous, caducous. *Figs* axillary, solitary; peduncle 1.2–1.8 cm long; basal bracts 3, c. 2 mm long, caducous; receptacle subglobose, c. 0.8 mm diam. when dry, non-stipitate or up to 0.2 mm long stipitate, densely yellowish subhirtellous to subtomentose, without lateral bracts, colour at maturity unknown, apex convex, ostiole 1.5–2 mm diam., surrounded by erect apical bracts; internal hairs abundant, yellowish.

Distribution — *Malesia*: New Guinea.

Habitat — Forest, at low altitudes.

Note — This species shows close affinities to *F. subcuneata* in the characters of the vegetative parts and in the caducous basal bracts. As suggested by Corner (1969) the type material of *F. suffruticosa* might be a precociously flowering specimen of *F. subcuneata*. Because of the small size of the receptacle, the (conspicuous) narrow erect apical bracts, and the small size of the basal bracts (matching those of the Moluccan specimens of *F. subcuneata*) *F. suffruticosa* is (provisionally) maintained as distinct at the species level.

21. Ficus trichocerasa Diels

Ficus trichocerasa Diels, Bot. Jahrb. Syst. 67 (1935) 188; Corner, Gard. Bull. Singapore 21 (1965) 82.

Tree up to 25 m tall. *Leafy twigs* 2–5 mm thick, pale brown puberulous to tomentellous and pale to rusty brown hirtellous to subhirsute, occasionally with minute nodal glands; internodes hollow or solid; periderm persistent or flaking off (at least below the leaves). *Leaves* spirally arranged to subdistichous; lamina elliptic to oblong to (sub)obovate, (5–)8–25 by (1.5–)4–12 cm, (almost) symmetric or slightly asymmetric, subcoriaceous (to chartaceous), apex acuminate (to subcaudate), base cuneate to obtuse to rounded or to subcordate (or emarginate), margin entire, flat or ± revolute, at least towards the base; upper surface (or only the midrib, always?) initially subarachnoid villous, (also the midrib) soon glabrous, smooth, lower surface densely pale brown (sub)tomentose all veins or the smaller veins sparsely hairy to glabrous and the main veins pale brown subsericeous or pale to rusty brown (sub)hirsute; cystoliths only beneath; lateral veins 9–15 pairs, one, some or none of them furcate far from the margin, the basal pairs often ± distinct, often running ± distinctly parallel to the margin or not so, tertiary venation scalariform, ± prominent beneath; waxy glands in the axils of one or both of the basal lateral veins and often also smaller ones in the furcations of the lateral veins; petiole 1–3.5 cm long, pale brown tomentose or puberulous to tomentellous and pale to rusty brown hirtellous or (sub)hirsute, the epidermis flaking off; stipules (0.5–)1–2.7 cm long, often only partly (only on and along the keel) rusty brown to pale brown hirtellous to (sub)tomentose to subhirsute or to subsericeous or almost glabrous, caducous (or subpersistent). *Figs* axillary, solitary (or in pairs) or (also?) ramiflorous on tuberculate spurs on previous season's growth, or cauliflorous on up to c. 20 cm long, branched leafless branchlets on the trunk, with a peduncle 0.2–0.5 cm long or sessile; basal bracts 3 (or 4), (sub)verticillate or ± scattered, 1.5–3 mm long; receptacle subglobose, 0.8–1.5 cm diam. when dry, 1.5–2 cm diam. when fresh, densely rusty brown to yellowish subtomentose to puberulous, the indumentum (sooner or later) flaking off or persistent, often with one or some lateral bracts, mainly towards the base and towards the apex, at maturity red (or brownish or greenish?), apex convex to flat, ostiole 2–3 mm diam., surrounded by c. 5 often ± scattered apical bracts or not; internal hairs rather sparse to abundant, yellowish or whitish. — **Fig. 69.**

Distribution — *Malesia*: New Guinea.

Habitat — Forest, at altitudes up to c. 2600 m.

Notes — 1. This species shows affinities to *F. subcuneata*, but it can be distinguished by the indumentum disappearing from the midrib above and the persistent basal bracts.

Fig. 69. *Ficus trichocerasa* Diels. a. Leafy twig with figs; b–d. figs; e, f. long-styled flowers; g–k. fruits; l. short-styled flower (a, e–k: *Carr 15321*; b–d, l: *Carr 13212*).

2. The species is quite variable. At least two infraspecific entities (behaving as subspecies) can be recognized. The differences may be less clear between 1200 and 1500 m, near the lower limits of one of the entities and near the upper limits of the other.

KEY TO THE SUBSPECIES

1a. Indumentum on the midrib of the lamina ± patent beneath; stipules sparsely hairy to subglabrous . . . . . **b.** subsp. **pleioclada**

b. Indumentum on the midrib of the lamina appressed beneath; stipules ± densely hairy . . . . . **a.** subsp. **trichocerasa**

a. subsp. **trichocerasa**

Ficus incompta Diels, Bot. Jahrb. Syst. 67 (1935) 229; Summerh., J. Arnold Arbor. 22 (1949) 107.
Ficus lapidaria Corner, Blumea 18 (1970) 405, t. 8.

Stiff hairs on the leafy twig and the petiole relatively short – this part of the indumentum hirtellous rather than hirsute –, those on the lamina beneath, mainly on the midrib, appressed. *Lamina* mostly oblong to subobovate, the margin flat or sometimes slightly revolute towards the base; petiole relatively short, mostly 1–1.5 cm long; stipules usually ± extensively hairy. *Fig receptacle* usually with persistent indumentum.

Distribution — *Malesia*: New Guinea.

Habitat — Forest, usually along streams, sometimes (as rheophytic shrubs) in river beds, at altitudes up to 1400 m (or up to 2150 m).

Notes — 1. The majority of the specimens have oblong to subobovate leaves, mostly 10–20 cm long. Most of them were collected at altitudes up to 1400 m. A few specimens have elliptic leaves, in shape similar to most of the specimens of var. *pleioclada*, and were collected at altitudes between 1300 and 1500 m.

2. Another set of collections is distinct in the size of the lamina, less than 10 cm long, and somewhat in the shape, oblong to lanceolate. These collections have been made at altitudes between (1300–)1700–2150 m.

b. subsp. **pleioclada** (Diels) C.C. Berg

Ficus trichocerasa Diels subsp. *pleioclada* (Diels) C.C. Berg, Blumea 49 (2004) 184. — *Ficus pleioclada* Diels, Bot. Jahrb. Syst. 67 (1935) 216.

The stiff hairs on the leafy twigs and the petiole relatively long – this part of the indumentum hirsute rather than hirtellous –, those on the lamina beneath, usually also on the lateral veins, ± patent. *Lamina* mostly elliptic, the margin revolute, at least towards the base; petiole relatively long, mostly 1.5–2.5 cm long; stipules often only hairy at the base or on the keel, to subglabrous. *Fig receptacle* usually with early disappearing indumentum.

Distribution — *Malesia*: New Guinea.

Habitat — Forest, at altitudes between (1200–)1500 and 2600 m.

22. Ficus umbonata Reinw. ex Blume

Ficus umbonata Reinw. ex Blume, Bijdr. (1825) 454; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 297; King, Sp. Ficus 2 (1888) 91, t. 115A; Corner, Gard. Bull. Singapore 21 (1965) 80. — *Covellia umbonata* (Reinw. ex Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 323.
Ficus bembicicarpa Warb. ex Diels, Bot. Jahrb. Syst. 67 (1935) 197.

Shrub or tree up to 10 m tall. *Leafy twigs* 1.5–2.5 mm thick, muriculate to puberulous, ± ribbed; internodes solid; periderm persistent. *Leaves* distichous; lamina elliptic to oblong, (2–)5–14 by (1–)2.5–6 cm, (at least at the base) ± asymmetric, stiffly subcoriaceous, apex subacute to acuminate to obtuse, base (sub)cuneate, margin entire, often ± revolute; both surfaces hispidulous to subhispid, scabrous to scabridulous; cystoliths on both sides; lateral veins (4–)6–9 pairs, the basal pair ± distinct, tertiary venation reticulate to subscalariform; waxy glands in the axils of the basal lateral veins,

inconspicuous or only one conspicuous; petiole 0.4–0.8(–1.2) cm long, hispidulous to subhispid, scabrous to scabridulous, the epidermis flaking off; stipules 0.6–1 cm long, muriculate (to minutely puberulous), caducous. *Figs* axillary, solitary or in pairs, with a peduncle up to 0.6 cm long or (sub)sessile; basal bracts 3, (almost) verticillate, 1–1.5 mm long; receptacle subglobose to subpyriform, 1–1.3 cm diam. when dry, scabridulous, with 5 or 6 ribs, lateral bracts 1–3 or absent, colour at maturity unknown, apex slightly convex, ostiole 2.5–4 mm diam., ± umbonate; internal hairs absent. — **Map 8.**

Distribution — *Malesia*: Moluccas (Obi, Nusa Laut, Ternate) and New Guinea (northwestern: Sorong).

Habitat — Lowland forest or as shrub in rocky open terrain, at low altitudes.

Section Bosscheria

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Bosscheria* (Teijsm. & de Vriese) C.C. Berg, Blumea 49 (2004) 161. — *Bosscheria* Teijsm. & de Vriese, Natuurk. Tijdschr. Ned.-Indië 23 (1861) 212. — *Ficus* L. sect. *Covellia* (Gasp.) Miq. subsect. *Pandanusiiflorae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 293.

Ficus L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Sycidium* (Miq.) Corner ser. *Pungentes* Corner, Gard. Bull. Singapore 17 (1960) 444.

Trees dioecious. *Leaves* spirally arranged; lamina symmetric, chartaceous, margin denticulate; waxy glands bilateral in the axils of the basal lateral veins or additional ones elsewhere on the lamina beneath. *Figs* cauliflorous in clusters or globose heads on long leafless branchlets; basal bracts 3, verticillate; lateral bracts absent; internal hairs present. *Staminate flowers* not subtended by 2 bracteoles; stamen 1. *Tepals* of the pistillate flowers 3 or 4, free, oblong, glabrous; styles of long-styled flowers hairy. *Fruits* whitish, without keel, with slightly prominent pseudohilum.

Distribution — *Malesia*: From the Philippines to New Guinea; 2 related species.

Note — These two species are closely related and distinct by the absence of bracteoles subtending the staminate flowers (possibly because of the small size of the figs). Except for the free tepals of the pistillate flowers (in combination with waxy glands in the axils of the basal lateral veins), the two species show affinities to *F. calcarata* and *F. praestans* and related species. The two species are pollinated with species of *Ceratosolen* subg. *Ceratosolen*, which could indicate closer affinity to sect. *Sycomorus* than to sect. *Sycocarpus*. However, placing this group as a subsection in sect. *Sycocarpus* could be considered.

23. Ficus minahassae (Teijsm. & de Vriese) Miq.

Ficus minahassae (Teijsm. & de Vriese) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 231, 296; King, Sp. Ficus 2 (1888) 108, t. 140, 141; Koord., Minah. (1898) 604, t. 4; Merr., Bull. Bur. For. Philipp. 1 (1903) 18; Publ. Gov. Lab. Philipp. 17 (1904) 11; 27 (1905) 79; Elmer, Leafl. Philipp. Bot. 1 (1906) 57, 198; 1 (1907) 256; 2 (1908) 543; 4 (1911) 1264; 7 (1914) 2389; Merr., Sp. Blancoan. (1918) 125; Enum. Philipp. Flow. Pl. 2 (1923) 57; Elmer, Leafl. Philipp. Bot. 9 (1937) 2436; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 221, f. 20; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 302; Corner, Gard. Bull. Singapore 21 (1965) 73; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 289. — *Bosscheria minahassae* Teijsm. & de Vriese, Natuurk. Tijdschr. Ned.-Indië 23 (1861) 212.

Ficus glomerata Blanco, Fl. Filip. (1837) 683, non Roxb. 1798; ed. 2 (1845) 475; Náves in Blanco, Fl. Filip., ed. 3, 3 (1879) 87.
Ficus riedelii auct. non Teijsm. ex Miq.: Haberlandt, Bot. Tropenreise (1893) 131.

Tree up to 25 m tall, sometimes with short stilt-roots. *Leafy twigs* 2–6 mm thick, brown hirsute to subsetose, without nodal glands, hollow or solid with ample pith; periderm persistent. *Leaves* spirally arranged; lamina elliptic to ovate to cordiform, (6–)13–30 by (3.5–)7–20 cm, symmetric or slightly asymmetric, chartaceous to subcoriaceous, apex acute to shortly acuminate, base cordate to rounded, margin denticulate; upper surface strigose to hirtellous, ± scabrous, lower surface white puberulous and brown(ish) hirtellous to subtomentose on the veins, scabridulous to scabrous; cystoliths only beneath; lateral veins 6–12 pairs, the basal pair branched, the other lateral veins often branched or furcate far from the margin, tertiary venation scalariform, ± prominent beneath; waxy glands in the axils of the (main) basal lateral veins and smaller ones in the axils of other lateral veins and in the axils of furcations of the lateral veins; petiole 3.5–10 cm long, brown hirsute to hirtellous, the epidermis persistent; stipules 2–6 cm long, on the midrib brown hirsute, for the rest minutely white puberulous or glabrous, mostly subpersistent (and the old stipules hanging down). *Figs* cauliflorous, in globose heads of 1–2 cm diameter, sessile or on up to 3 cm long branchlets with short internodes, these on unbranched or branched up to 3 m long pendulous leafless branchlets with long internodes, down to the base of the trunk; subsessile or with a peduncle up to 0.3 cm long; basal bracts 3, verticillate, 1–1.5 mm long; receptacle obconical, 0.4–0.6 cm long and 0.3–0.5 cm wide when dry, angled by compression, glabrous or minutely puberulous, at maturity red, apex subpeltate, concave to flat, ostiole c. 2 mm diam., umbonate, surrounded by 3–5 erect apical bracts; internal hairs abundant, yellowish. — **Fig. 70; Map 9.**

Distribution — *Malesia*: Borneo (northern), Philippines, Celebes (north eastern).

Habitat — Forest, at low altitudes.

Uses — The figs are edible and the bark is used for various utensils.

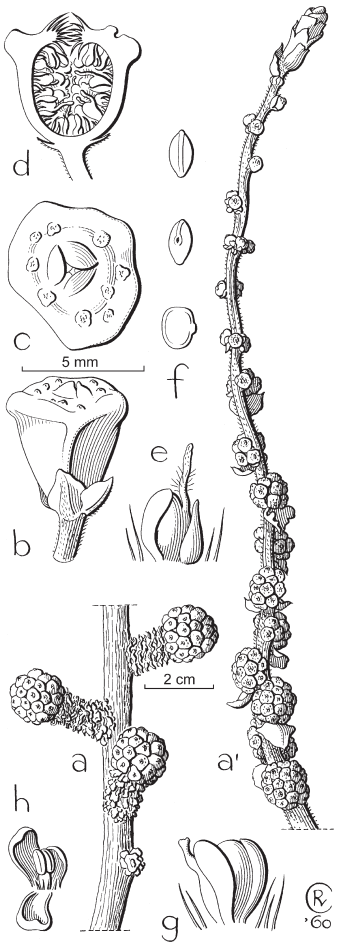
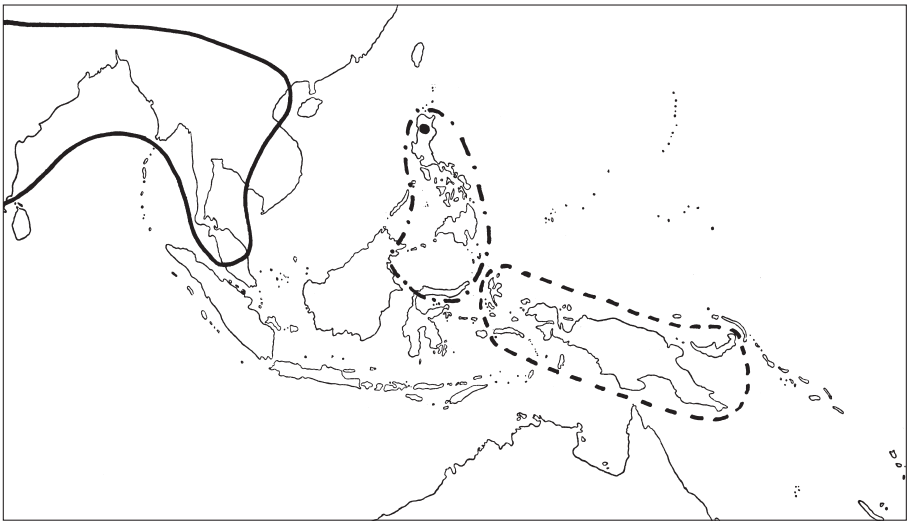


Fig. 70. *Ficus minahassae* (Teijsm. & de Vriese) Miq. a. Fig-bearing branchlet, proximal part; a'. fig-bearing branchlet, distal part; b. fig; c, d. ostiole; e. long-styled flower; f. fruits; g. short-styled flower; h. staminate flower (a, a': *Alston 16186*; b–f: *PNH 3597*; g, h: *Elmer 22271*).



Map 9. Distribution of some species of subg. *Sycomorus* sect. *Bosscheria* and sect. *Hemicardia*: *F. minnahassae* (Teijsm. & de Vriese) Miq. (dot-dash line); *F. pungens* Reinw. ex Blume (broken line and black dot); *F. semicordata* Buch.-Ham. ex Sm. (continuous line).

24. **Ficus pungens** Reinw. ex Blume

Ficus pungens Reinw. ex Blume, Bijdr. (1825) 478; Miq., Fl. Ind. Bat. 1, 2 (1859) 291; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; Corner, Gard. Bull. Singapore 17 (1960) 450.

Ficus myriocarpa Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 230, 296; King, Sp. Ficus 2 (1888) 107, t. 139; K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 281; Renner, Bot. Jahrb. Syst. 39 (1907) 398; Summerh., J. Arnold Arbor. 10 (1929) 149; Diels, Bot. Jahrb. Syst. 67 (1935) 217; 22 (1941) 101.

Ficus ovalifolia Ridl., Trans. Linn. Soc. London, Bot. 9 (1916) 149; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 573; Diels, Bot. Jahrb. Syst. 67 (1935) 215 (sub *F. chalmersii*).

Ficus kalingaensis Merr., Philipp. J. Sci. 20 (1922) 370; Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 305.

Ficus petrotica Diels, Bot. Jahrb. Syst. 67 (1935) 217; Corner, Gard. Bull. Singapore 21 (1965) 63; C.C. Berg, Blumea 49 (2004) 161.

Tree up to 25 m tall, sometimes with short stilt-roots. *Leafy twigs* 4–8(–12) mm thick, patent to extrorsely white appressed-puberulous and/or brown setose-hirsute with irritating hairs, sometimes with small nodal glands, hollow or solid (with copious pith); periderm persistent. *Leaves* spirally arranged; lamina cordiform to ovate to elliptic or to obovate, (8–)12–30(–45) by (4–)8–25(–35) cm, symmetric, chartaceous to subcoriaceous, apex (sub)acuminate, base cordate to subcordate (to rounded to obtuse), margin (serrate-)dentate; upper surface whitish puberulous to hirtellous to subhispid, ± scabrous, lower surface white puberulous to subtomentose and brown setose-hirtellous to -subhirsute, whitish strigose to strigillose or whitish subtomentose to hirtellous to subhispid on the veins; cystoliths only beneath; lateral veins 6–11 pairs, the basal pair branched, up to 1/3–1/2 the length of the lamina, the other lateral veins often

Fig. 71. *Ficus pungens* Reinw. ex Blume. Fig-bearing branchlets, Papua New Guinea. Photo R.D. Hoogland.

branched or furcate far from the margin, tertiary venation scalariform, ± prominent beneath; waxy glands in the axils of (nearly) all lateral veins, those of the basal ones on the midrib and/or the basis of the lateral veins, moreover, small ones in furcations of the lateral veins; petiole 2–22 cm long, white puberulous and/or brown setose-hirsute with irritating hairs or densely white puberulous to subtomentose and brownish hirtellous, the epidermis flaking off; stipules 3–7 cm long, white appressed-puberulous and/or brown setose-hirsute, often only on the midrib, caducous or subpersistent, the old stipules recurved/hanging down. *Figs* cauliflorous (to flagelliflorous), clustered on up to 1 cm long short-shoots of leafless, branched or unbranched, (sub)pendulous, up to 2.5 m long, sometimes rooting branchlets with the internodes 1–2 cm long, borne on the (base of the) trunk or also on the main branches; with a peduncle up to 0.8(–2) cm long or subsessile; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose, 0.4–0.8 cm diam. when dry, 0.6–1.2 cm diam. when fresh, brownish puberulous, often with conspicuous lenticels, without lateral bracts, at maturity red, apex ± convex, ostiole 1–1.5 mm diam., ± prominent to flat, surrounded by 5 or 6 incurved to erect apical bracts; internal hairs abundant. — **Fig. 71; Map 9.**

Distribution — *Malesia*: Celebes, Moluccas, New Guinea (incl. New Britain).

Habitat — Forest and secondary growth, at altitudes up to 1700 m.

Notes — 1. For lectotypification of *F. petrotica* see Blumea 49 (2004) 161.

2. Aspects of pollination and dispersal in this species are treated by Dumont & Weiblen (J. Trop. Ecol. 20 (2004) 233–238).

Section Dammaropsis

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Dammaropsis* (Warb.) C.C. Berg, Blumea 49 (2004) 160. — *Dammaropsis* Warb., Bot. Jahrb. Syst. 13 (1891) 296. — *Ficus* L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Dammaropsis* (Warb.) Corner, Gard. Bull. Singapore 18 (1960) 38.

Ficus L. sect. *Pseudopalma* Elmer, Leafl. Philipp. Bot. 1 (1908) 283; 9 (1937) 3431; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 318. — *Ficus* L. subg. *Ficus* sect. *Ficus* subsect. *Ficus* ser. *Pseudopalmeae* (Elmer) Corner, Gard. Bull. Singapore 17 (1960) 418.

Ficus L. subg. *Ficus* sect. *Ficus* subsect. *Ficus* ser. *Rivulares* Corner, Gard. Bull. Singapore 17 (1960) 418.

Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Auriculisperma* Corner ser. *Theophrastoides* Corner, Gard. Bull. Singapore 18 (1960) 38.

Trees or shrubs, monocaul or sparingly branched with pachycladous branches. Nodal glands absent. *Leaves* spirally arranged, ± tufted; lamina symmetric, coriaceous to chartaceous; margin lobate to entire; cystoliths on both sides or only beneath; waxy glands in the axils of the basal lateral veins, additional ones in axils of branches or furcations of lateral veins; stipules often subpersistent. *Figs* axillary and/or cauliflorous or axillary; basal bracts 3 (or more), subverticillate to scattered or indistinct; lateral bracts present or absent; internal hairs absent. *Staminate flowers* subtended by 2 bracteoles; stamens 1 or 2. *Tepals* of the pistillate flowers connate (or free), glabrous; style glabrous. *Fruits* lenticular, simply keeled, smooth, whitish.

Distribution — From the Philippines to the Solomon Islands; 5 species of which 2 Melanesian (*F. solomonensis* Rech. and *F. theophrastoides* Seem.).

Notes — 1. The section is characterized by monocaul or sparingly branched pachycladous trees with large leaves in tufts. The small-leaved form *F. theophrastoides* var. *angustifolia* Corner (1972) 432 indicates that the difference in leaf size as found between *F. pseudopalma* and *F. rivularis* can even be found within a species.

2. The variation in the degree of fusion of the tepals of the pistillate flowers is mentioned above.

3. Species of *Ceratosolen* subg. *Strepitus* are pollinators of the species of this section.

25. Ficus dammaropsis Diels

Ficus dammaropsis Diels, Flora 128 (1933) 32, t. 2A, B; Bot. Jahrb. Syst. 67 (1935) 204; Doct. v. Leeuwen, Trop. Natuur 15 (1926) 179, f. 3, 4; Corner, Gard. Bull. Singapore 21 (1965) 84. — *Dammaropsis kingiana* Warb., Bot. Jahrb. Syst. 13 (1891) 296; K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 268; Renner, Bot. Jahrb. Syst. 39 (1907) 298.

Ficus dammaropsis Diels var. *obtusa* Corner, Gard. Bull. Singapore 18 (1960) 42.

Unbranched or sparingly branched shrub or tree up to 10 m tall, latex white. *Leaf twigs* 10–15 mm thick, white puberulous to subglabrous, solid or hollow; periderm

Fig. 72. *Ficus dammaropsis* Diels. Leafy twig and collectors Duncan Poore (left) and E.J.H. Corner, Papua New Guinea. Photo L. Mattsson, UNESCO.

flaking off. *Leaves* spirally arranged; lamina elliptic, 40–90 by 25–60 cm, symmetric, (sub)coriaceous (brittle when dry), apex shortly acuminate, base cordate, margin sinuate to sublobate; upper surface glabrous or hispidulous, smooth or ± scabrous, lower surface white puberulous to hirtellous to subtomentose or hispidulous, smooth or ± scabrous; cystoliths only beneath; lateral veins 8–12 pairs, basal pair branched, the other lateral veins often branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins and in the axils of branches or furcations of the lateral veins; petiole 4–23 cm long, glabrous, white puberulous to hirtellous to substrigose, the epidermis flaking off; stipules 10–30 cm long, glabrous or white hirtellous to substrigose to subsericeous, caducous (or subpersistent on fig-bearing branchlets). *Figs* axillary and solitary or ramiflorous on stout unbranched up to 30 cm long leafless branchlets (with short internodes, prominent scars of the fig peduncles and at the top a cluster of subpersistent up to 8 cm long stipules), subsessile or with a peduncle up to 1 cm long; basal bracts indistinct, passing into the lateral bracts; receptacle obovoid to ellipsoid to subglobose, 4–8 cm diam. when dry, 6–13 cm diam. when fresh, subglabrous, with numerous red or yellow coriaceous lateral bracts, varying from narrowly to broadly ovate and up to 6 cm long or semicircular and up to 7 cm broad and up to 3.5 cm long, at maturity red (or purple brown), apex ± convex, ostiole c. 10 mm diam., prominent, surrounded by erect apical bracts, wall thick and with projections into the fig cavity; internal hairs absent. — **Fig. 72.**

Distribution — *Malesia*: New Guinea.

Habitat — Riverbanks and forest clearings, also planted in gardens, at altitudes up to 2300 m.

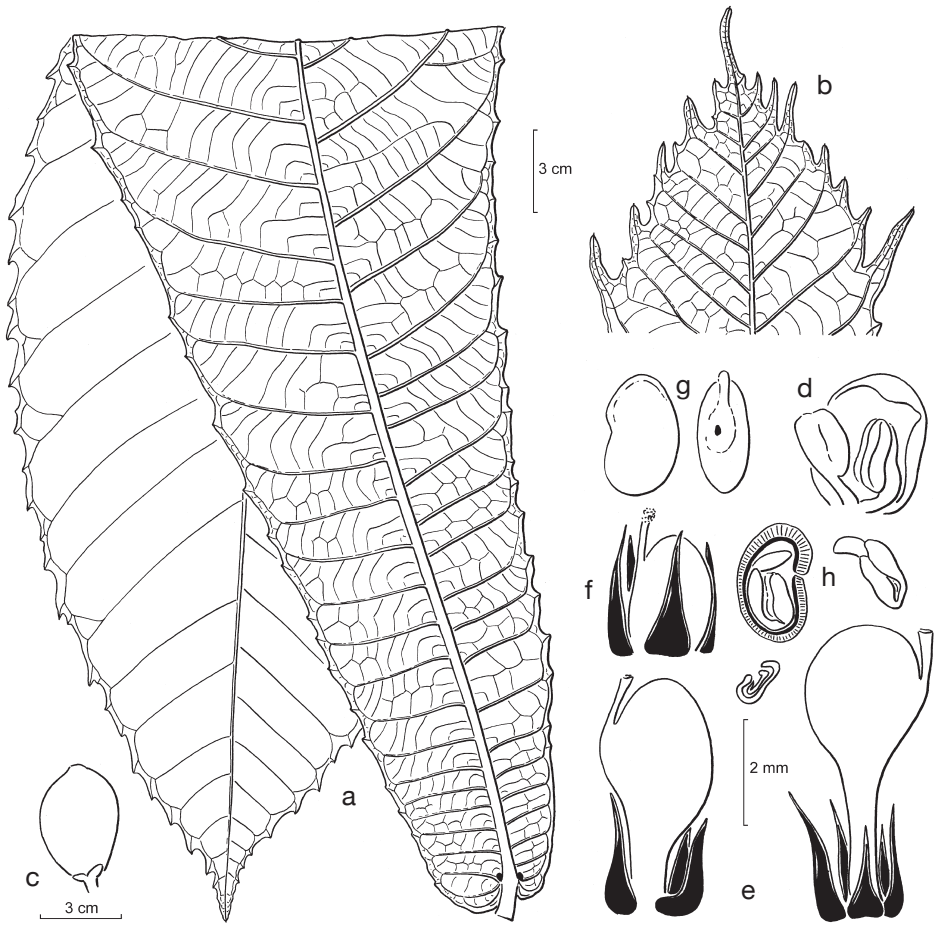


Fig. 73. *Ficus pseudopalma* Blanco. a. Leaf; b. apex of sapling lamina; c. fig; d. staminate flower; e. short-styled flowers; f. long-styled flower; g. fruits; h. embryos (a: *Bur. Sci. 983*; b: *PNH 18506*; c: collection used unknown; d, e: *PNH 16343*; f–h: *PNH 11723*). From Philos. Trans., Ser. B, 256 (1967) 294.

26. **Ficus pseudopalma** Blanco

Ficus pseudopalma Blanco, Fl. Filip. (1837) 680; ed. 2 (1845) 473; Náves in Blanco, Fl. Filip., ed. 3, 3 (1879) 84, t. 356; Náves & Fern.-Vill., Nov. App. (1880) 202; A. Usteri, Beitr. Kenntnis Philipp. (1904) 127, sphalm. — *Ficus palmifolia* Usteri, Publ. Gov. Lab. Philipp. 6 (1904) 9; 27 (1905) 80; Philipp. J. Sci., 1, Suppl. (1906) 44; Elmer, Leafl. Philipp. Bot. 1 (1906) 202; 1 (1907) 257; Renner, Bot. Jahrb. Syst. 39 (1907) 397; Elmer, Leafl. Philipp. Bot. 2 (1908) 540; Merr., Philipp. J. Sci., Bot. 4 (1911) 1316; 7 (1914) 2387; Sp. Blancoan. (1918) 127; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 220, f. 19; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 62; Herb., Philip. Agr. 13 (1924) t. 4; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 321; Corner, Gard. Bull. Singapore 21 (1965) 36.

Ficus haenkei Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 195.

Ficus blancoi Elmer, Leafl. Philipp. Bot. 1 (1908) 283; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 324.
Ficus blancoi Elmer var. *longegrandifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 324.
Ficus blancoi Elmer var. *oblanceifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 324.

Sparingly branched treelet or tree up to 8 m tall. *Leafy twigs* 7–12 mm thick, glabrous, hollow; periderm ± flaking off. *Leaves* spirally arranged, ± tufted; lamina sagittate-pandurate, 25–80 by 7–25 cm, symmetric, coriaceous, apex acuminate, base cordate, margin coarsely dentate to sublobate; both surfaces glabrous, smooth; cystoliths on both sides; lateral veins 20–24 pairs, most of them furcate far from the margin, the lower ones departing the midrib at right angles, tertiary venation (sub)scalariform; waxy glands in the axils of the basal lateral veins and smaller ones in furcations of the lateral veins; petiole 0.5–3 cm long, glabrous, the epidermis flaking off; stipules 2–5

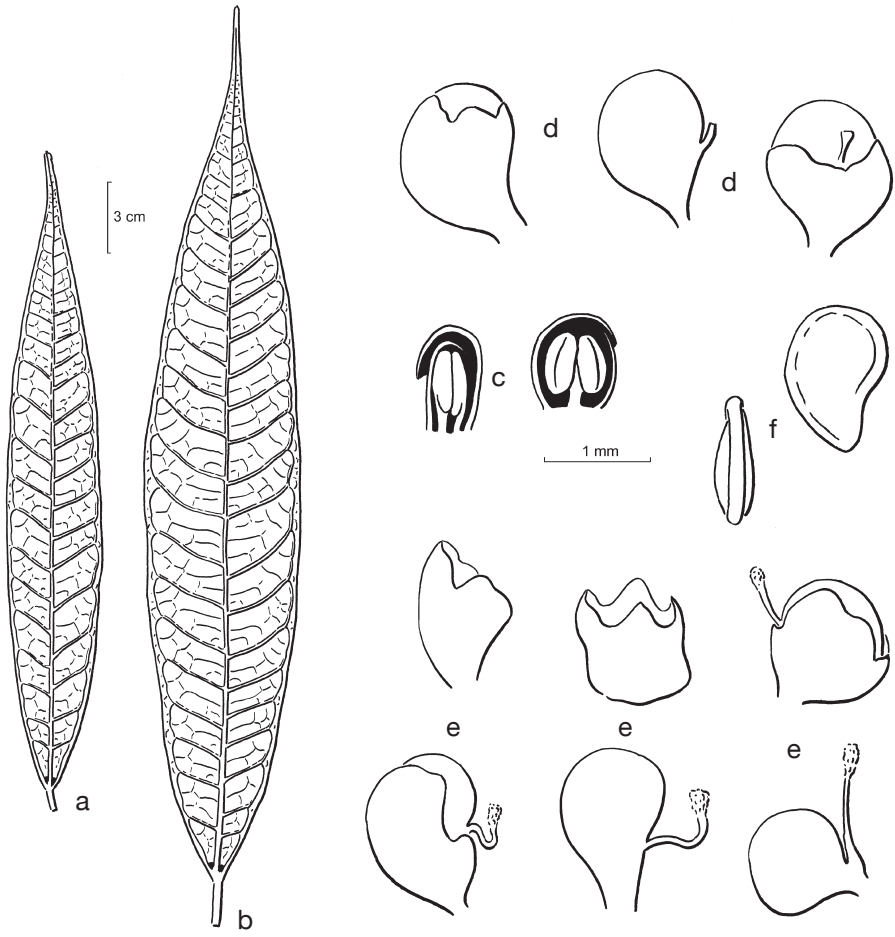


Fig. 74. *Ficus rivularis* Merr. a, b. Leaves; c. staminate flowers; d. short-styled flowers, e. long-styled flowers and perianths; f. fruits (a: *PNH 2270*; b: *Bur. Sci. 28875*; c, d: *Bur. Sci. 76850*; e, f: *Bur. Sci. 78576*). From Philos. Trans., Ser. B, 256 (1969) 327.

cm long, (usually) glabrous, (sub)persistent. *Figs* axillary, in pairs, with a peduncle up to 0.6 cm long or (sub)sessile; basal bracts 3, ± scattered 3–5 mm long, coriaceous, glabrous, persistent; receptacle ellipsoid, 3–4 by 2–3 cm when dry, glabrous, usually ± conspicuously pustulate-lenticellate, sometimes with a single or several lateral bracts, at maturity yellowish, apex slightly protracted, ostiole 5–7 mm diam., surrounded by erect apical bracts; internal bristles absent. — **Fig. 73.**

Distribution — *Malesia*: Philippines (Luzon).

Habitat — Forest and secondary growth, at altitudes up to 1300 m.

Note — This species shows close affinities to *F. theophrastoides* from the Solomon Islands.

27. Ficus rivularis Merr.

Ficus rivularis Merr., Philipp. J. Sci., Bot. 9 (1914) 272; Enum. Philipp. Flow. Pl. 2 (1923) 64; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 339; Corner, Gard. Bull. Singapore 21 (1965) 35.

Shrub up to 3 m tall. *Leafy twigs* 1.5–3.5 mm thick, puberulous, solid. *Leaves* (sub)-distichous; lamina linear-lanceolate, 9–24 by 1–2(–4.5) cm, slightly asymmetric at the base, coriaceous, apex subcaudate, base cuneate, margin entire, ± revolute; both surfaces glabrous, smooth; cystoliths only beneath; lateral veins 10–20 pairs, basal pair not distinct, tertiary venation reticulate; waxy glands in the axils of the basal lateral veins, inconspicuous; petiole 0.2–1 cm long, appressed-puberulous, the epidermis flaking off; stipules 1.2–2.5(–3.5) cm long, glabrous or at the base puberulous, caducous. *Figs* axillary, solitary; peduncle 0.5–1.5(–2.2) cm long; basal bracts 3, (sub)verticillate, c. 1.5 mm long, minutely puberulous, persistent; receptacle subglobose to obovoid, 1.2–1.8 cm diam. when dry, up to 0.6 cm long stipitate or non-stipitate, minutely puberulous, without lateral bracts, colour at maturity unknown, apex ± convex to flat, ostiole c. 3 mm diam., prominent (± umbonate); internal hairs absent. — **Fig. 74.**

Distribution — *Malesia*: Philippines (Luzon).

Habitat — Along streams, at low altitudes.

Section Hemicardia

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Hemicardia* C.C. Berg, Blumea 49 (2004) 158. — *Ficus* L. subg. *Ficus* sect. *Sycidium* Miq. subsect. *Sycidium* (Miq.) Corner ser. *Prostratae* Corner, Gard. Bull. Singapore 17 (1960) 444.

Trees dioecious. *Leaves* distichous and lamina asymmetric to symmetric on lateral branches, spirally arranged and lamina symmetric on the stem, chartaceous to subcoriaceous; cystoliths only (?) beneath; waxy glands unilateral in the axils of the lateral veins at the broad side of the lamina (or bilaterally); petiole short. *Figs* flagelliflorous (or axillary); basal bracts 3, verticillate; lateral bracts present or absent; internal hairs present. *Staminate flowers* subtended by 2 bracteoles; stamens 1 or 2. *Tepals* of the pistillate flowers 3–5, free, linear to subobovate, glabrous; styles glabrous. *Fruits* red-brown to whitish.

Distribution — Three species in the Sino-Himalayan region: *F. semicordata* extending to the Malay Peninsula; *F. koutumensis* Corner and *F. prostrata* (Wall. ex Miq.) Miq. are confined to the region.

Note — This subsection shows similarities to sect. *Sycomorus* in the characters of the perianth of the pistillate flowers, but in other features, such as the presence of lateral bracts and distichous leaves with asymmetric laminas it would fit in sect. *Sycocarpus*. Placing the entity as subsection in sect. *Sycomorus* could be considered.

28. Ficus semicordata Buch.-Ham. ex Sm.

Ficus semicordata Buch.-Ham. ex Sm. in Rees, Cycl. 14 (1810) Ficus 71; Corner, Gard. Bull. Singapore 17 (1960) 449; 21 (1965) 62.

Ficus cunia Buch.-Ham. ex Roxb., Fl. Ind., ed. Carey 3 (1832) 561 (‘*cunea* Buch.-Ham.’); Steud., Nomencl. Bot. ed. 2, 1 (1841) 635, ‘*cunea*’; Wight, Ic. 2 (1843) t. 648; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 282, 296; Kurz, Forest Fl. Burma 2 (1877) 461; King, Sp. Ficus 2 (1888) 101, t. 126; Fl. Brit. India 5 (1888) 523; Renner, Bot. Jahrb. Syst. 39 (1907) 397; Ridl., Fl. Malay Penins. 3 (1924) 341; Gagnep., Fl. Indo-Chine 5 (1928) 814; Hand.-Mazz., Symb. Sin. 7 (1929) 93; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 21, t. 8, 9; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1006; Corner, Wayside Trees (1940) 681; Puri, J. Ind. Bot. Soc. 26 (1947) 131; Kochummen, Tree Fl. Malaya 3 (1978) 156. — *Covellia cunia* (Buch.-Ham. ex Roxb.) Miq., London J. Bot. 7 (1848) 459.

Tremotis cordata Raf., Sylv. Tellur. (1838) 59.

Covellia inaequiloba Miq., London J. Bot. 7 (1848) 459.

Ficus hapalophylla Kurz, Forest Fl. Burma 2 (1877) 461.

Tree up to 15 m tall, with wide-spreading branches. *Leafy twigs* 2–4 mm thick, white puberulous and brown to whitish (sub)hirtellous to subvillous, without nodal glands; internodes hollow; periderm flaking off. *Leaves* distichous; lamina oblong to subobovate to lanceolate (or to elliptic), (4–)10–25(–45) by (3–)4–12(–17) cm, asymmetric on lateral branches, 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 puberulous to subhispidulous to strigillose, often scabridulous; cystoliths (only) beneath; lateral veins (4–)9–15 (in lanceolate leaves –26) pairs, some or most of then branched or furcate, the basal pair at the broad side up to 1/6–1/3(–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, on the keel to brown strigose or subhirtellous, caducous. *Figs* sometimes axillary, mostly cauliflorous on leafless branches hanging from the main branches or flagelliflorous on up to 2 m long stolons departing from the base of the trunk and with up to 4 cm long internodes; with a peduncle 0.2–1 cm long or subsessile; basal bracts 3, verticillate, 1–2.5 mm long; receptacle subglobose, 1–2 cm diam. when dry, 2–2.5 cm diam. when fresh, up to 0.5 cm long stipitate or non-stipitate, white to yellowish (sub)tomentose or (sub)glabrous, mostly with a few lateral bracts, at maturity red to red-brown, apex convex, ostiole c. 3 mm diam., surrounded by 5 apical bracts; internal hairs abundant to very sparse, white or brownish. *Tepals* of pistillate flowers free, linear to spathulate (to subobovate). *Fruits* whitish. — **Map 9.**

Distribution — From India to Myanmar, S China, Vietnam, Thailand, and Malesia; in *Malesia*: Malay Peninsula.

Habitat — Forest and secondary growth (India and China). Altitudes up to 1750 m.

Note — Young plants (in cultivation at Store Milde, May 2004) showed asymmetric leaves on the plagiotropic branches, but the leaves on the orthotropic branches are symmetric.

Section Papuasyce

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Papuasyce* (Corner) C.C. Berg, Blumea 49 (2004) 160. — *Ficus* L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Papuasyce* Corner, Gard. Bull. Singapore 19 (1962) 395.

Trees, monoecious or dioecious. Nodal glands absent. *Leaves* spirally arranged; lamina symmetric, coriaceous, margin entire; cystoliths only beneath; waxy glands in the axils of the basal lateral veins; stipules caducous. *Fig* cauliflorous; basal bracts 3, verticillate, persistent or caducous; lateral bracts absent; internal hairs absent. *Staminate flowers* subtended by 2 bracteoles; stamens 1 or 2 (or 3). *Tepals* of the pistillate flowers connate, glabrous; styles glabrous. *Fruits* (sub)lenticular, not or hardly keeled, smooth, whitish.

Distribution — New Guinea and Fiji; 3 species of which 2 Malesian and *F. pritchardii* Seem. endemic to Fiji.

Notes — 1. These three species included in this section show close affinities. In contrast to the situation in sect. *Sycomorus* (see p. 338), this group of monoecious species does not show evident morphological links to a group of dioecious species. The most likely link is with sect. *Adenosperma*.

2. The two Malesian species have species of *Ceratosolen* subg. *Strepitus* as pollinators but the Melanesian species a species of subg. *Ceratosolen*.

3. According to Weiblen (Syst. Biol. 53 (2004) 128–139) *F. itoana* is (gyno)dioecious, which is confirmed by re-examination of material. Seed-producing figs have neuter flowers as substitutes of staminate ones and the 'gall figs' have staminate flowers. In both the pistillate flowers are arranged as in monoecious species and the styles varies in length, accordingly. The situation in *F. itoana* may indicate how the transformation from monoecious state into the dioecious one (or the other way round?) could have happened.

29. Ficus itoana Diels

Ficus itoana Diels, Bot. Jahrb. Syst. 67 (1935) 219; Corner, Gard. Bull. Singapore 21 (1965) 85.

Tree up to 20 m tall, dioecious. *Leafy twigs* 2–6 mm thick, glabrous, hollow; periderm of older parts flaking off. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)obovate, (7–)10–28 by (3–)5–14 cm, often slightly asymmetric at the base, (sub)coriaceous, apex (shortly) acuminate, base subcuneate to rounded, margin entire; both surfaces glabrous, smooth; cystoliths only beneath; lateral veins (4–)6–10 pairs, basal pair often running ± parallel to the margin up to 1/6–1/4 the length of the lamina, unbranched, other lateral veins often furcate far from the margin, tertiary venation (sub)scalariform; waxy glands indistinct or only one distinct in the axils of the basal lateral veins; petiole 2–9 cm long, glabrous, the epidermis flaking off; stipules 1–2.5 cm long, glabrous, caducous. *Figs* cauliflorous on clustered stout branched or unbranched leafless branchlets on the trunk; peduncle 1.5–3.5 cm long; basal bracts 3, 2–4 mm

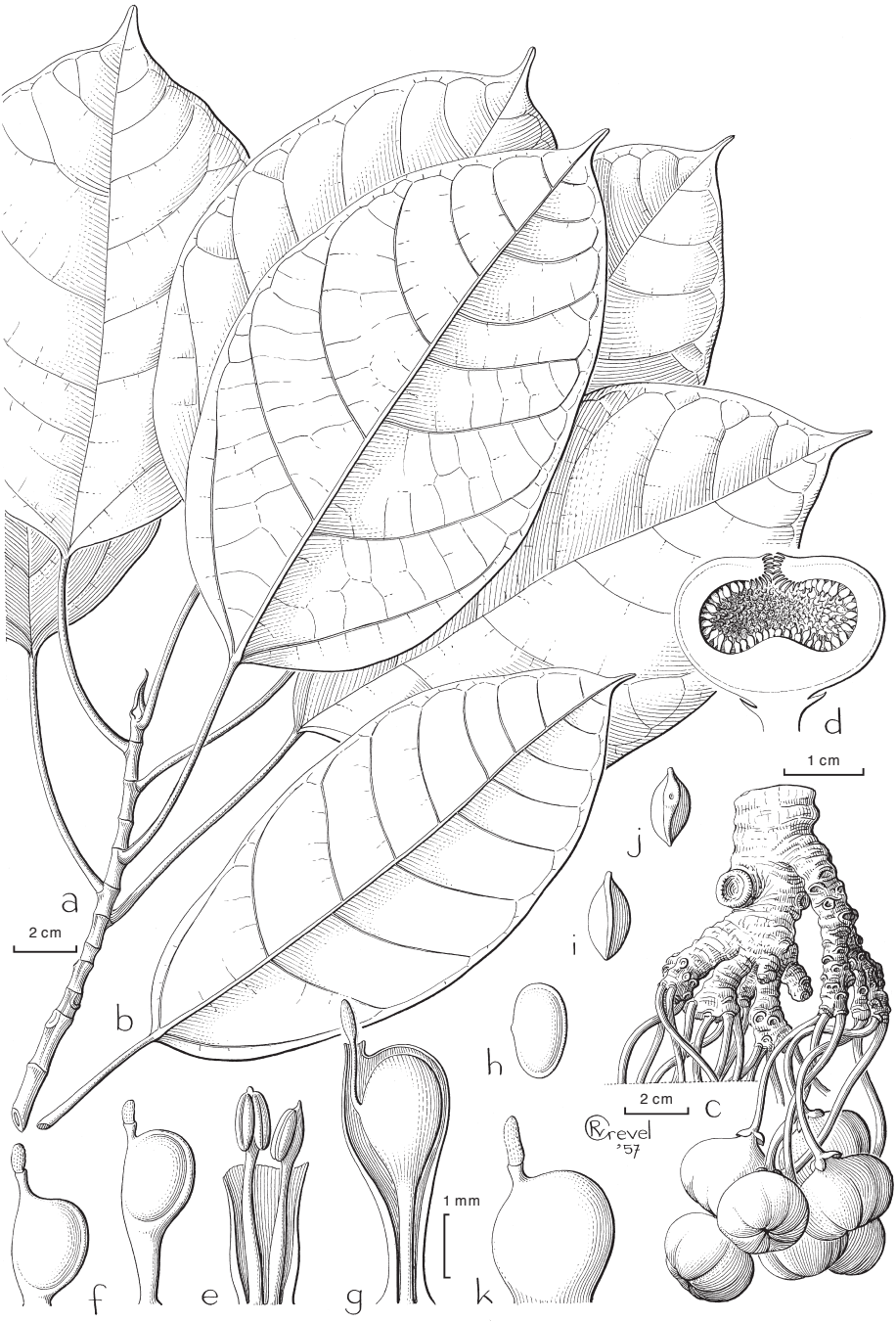


Fig. 75. *Ficus itoana* Diels. a. Leafy twig; b. leaf: c. fig-bearing branchlets; d. fig; e. staminate flower; f. seed-producing flowers; g, k. gall-producing flowers; h–j. fruits (a, c, d, g: *Carr 15444*; b, f, h–j: *Schlechter 18982*; e, k: *Carr 13162*).

Fig. 76. *Ficus itoana* Diels. Trunk with fig-bearing branchlets, Papua New Guinea. Photo R.D. Hoogland.

long, subverticillate, coriaceous, glabrous; receptacle depressed-globose to subpyriform, 1.5–3.5 by 1.5–4 cm when dry, up to 6 cm diam. when fresh, often up to 1.3 cm long stipitate, glabrous, without lateral bracts, reddish to purplish red at maturity, apex ± concave, ostiole 4–6 mm diam., ± prominent; internal hairs absent. — **Fig. 75, 76.**

Distribution — *Malesia*: New Guinea.

Habitat — Forest, at altitudes up to 1800 m.

30. Ficus microdictya Diels

Ficus microdictya Diels, Bot. Jahrb. Syst. 67 (1935) 229; Summerh., J. Arnold Arbor. 22 (1941) 106; Corner, Gard. Bull. Singapore 21 (1965) 85.

Tree up to 20 m tall, monoecious. *Leafy twigs* 2.5–5 mm thick, glabrous, hollow; periderm of older parts ± flaking off. *Leaves* spirally arranged; lamina elliptic to oblong, 4–16 by 1.5–8.5 cm, symmetric or slightly asymmetric, coriaceous, apex subacute to subacuminate, base cuneate, margin entire, often ± revolute towards the base; both surfaces glabrous, smooth; cystoliths only beneath; lateral veins 4–8(–10) pairs, basal pair straight or tending to run parallel to the margin, 1/4–1/3(–1/2) the length of the lamina, unbranched, tertiary venation reticulate; waxy glands in the axils of the basal lateral veins; petiole 1–6 cm long, glabrous, the epidermis flaking off; stipules 1–2(–3) cm long, glabrous, caducous. *Figs* axillary, solitary or in pairs or cauliflorous on stout branched or unbranched up to 10 cm long branchlets on the older wood; peduncle

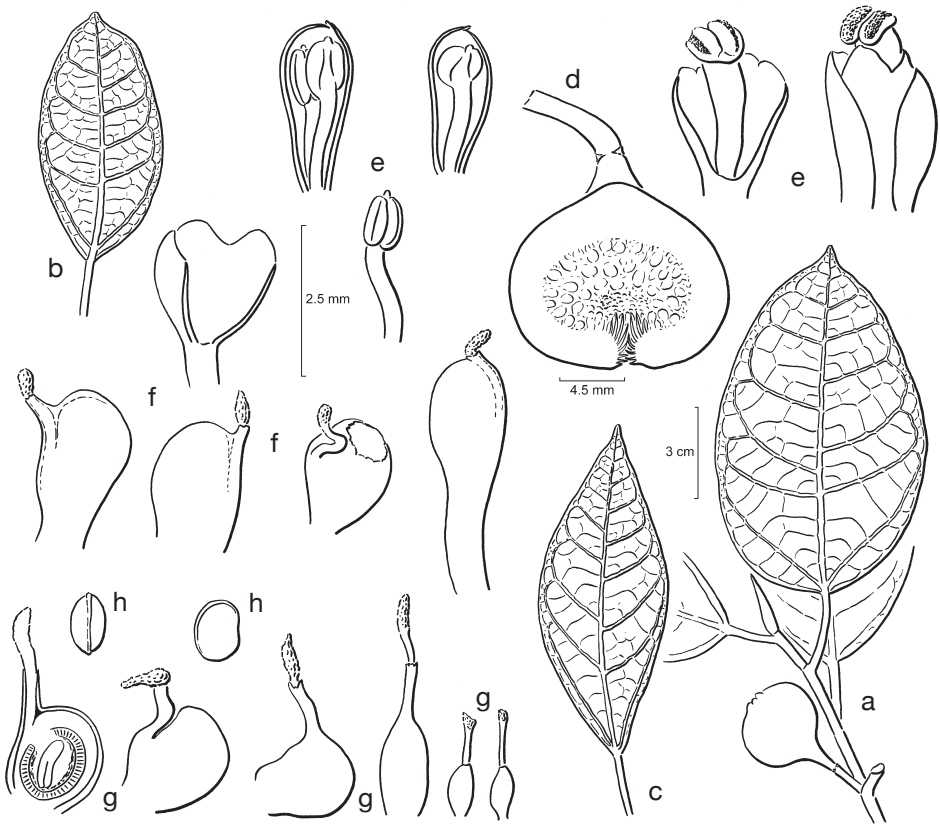


Fig. 77. *Ficus microdictya* Diels. a. Leafy twig with fig; b, c. leaves; d. fig; e. staminate flowers and stamen; f. short-styled flowers, perianth, and opened 'gall-fruit'; g. long-styled flowers; h. fruits (a, d–h: *Corner s.n.*; b: *Brass 4948*; c: *Carr 13785*). From Philos. Trans., Ser. B, 259 (1970) 399.

0.3–1.5 cm long; basal bracts 3, 1.5–3 mm long, verticillate or ± scattered, chartaceous, ciliolate, persistent; receptacle subglobose, 1–2 cm diam. when dry, 2–3.5 cm diam. when fresh, up to 0.3 cm long stipitate or non-stipitate, glabrous, without lateral bracts, red(dish) at maturity, apex convex, ostiole c. 4 mm diam., prominent (umbonate); internal hairs absent. — **Fig. 77.**

Distribution — *Malesia*: New Guinea (eastern).

Habitat — Montane forest, at altitudes between 2000 and c. 2600 m.

Section Sycocarpus

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Sycocarpus* Miq., Ann. Sci. Nat. Bot., Sér. 3, 1 (1844) 33; Fl. Ind. Bat. 1, 2 (1859) 322; Corner, Gard. Bull. Singapore 18 (1960) 36; 19 (1962) 394.

Gonusuke Raf., Sylv. Tellur. (1838) 58.

Sycomorphe Miq., Ann. Sci. Nat. Bot., Sér 3, 1 (Jan. 1844) 35. — *Ficus* L. sect. *Sycomorphe* (Miq.) Endl., Gen. Pl., Suppl. 4, 2 (1847) 34.

Cystogyne Gasp., Giorn. Bot. Ital. 2 (1844) 217. — *Ficus* L. sect. *Cystogyne* (Gasp.) Endl., Gen. Pl., Suppl. 4, 2 (1847) 35; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296. — *Covellia* Gasp. ex Miq. sect. *Cystogyne* (Gasp.) Miq., London J. Bot. 7 (1848) 468; Fl. Ind. Bat. 1, 2 (1859) 326.

Covellia Gasp. ex Miq., London J. Bot. 7 (1848) 458, non Gasp. 1844 (quoad nomen). — *Ficus* L. subg. *Covellia* (Gasp. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 282, 296. — *Ficus* L. sect. *Covellia* (Gasp.) Miq., Gen. Pl. 3 (1880) 369; King, Sp. Ficus 1 (1887) 2, 97; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 292, 375.

Covellia Gasp. ex Miq. sect. *Eucovellia* Miq., Fl. Ind. Bat. 1, 2 (1859) 322.

Covellia Gasp. ex Miq. sect. *Paracovellia* Miq., Fl. Ind. Bat. 1, 2 (1859) 325.

Dioecious trees or shrubs; internodes usually not distinctly different in length and leaves not tufted; nodal glands often present. *Leaves* spirally arranged, often partly (sub)opposite or (sub)distichous, often ± asymmetric, mostly chartaceous (to subcoriaceous), margin mostly dentate (to denticulate); cystoliths present in the epidermis of the lower surface of the lamina or also of the upper one; lateral veins (in medium-sized to large leaves) often branched or furcate far from the margin, basal pair usually not distinctly different from the other lateral veins, the lower lateral veins usually not distinctly loop-connected, tertiary venation usually scalariform; waxy glands often present on the lower surface of the lamina, rarely in the axils of the basal pair of lateral veins, commonly in the axils of some of the lateral veins of the middle part of the lamina, and then often in slit-shaped extensions of the axils, often smaller ones in the furcations of lateral veins, or these glands absent on the lamina. *Figs* axillary and solitary or in pairs, or on spurs, (ramiflorous) on spurs on the smaller branches, or (cauliflorous) on spurs, woody tubercles, or often on elongate leafless branchlets (but with (sub)persistent or caducous stipules) on the main branches and/or the trunk and then mostly with short internodes, or only on the base of the trunk, and then (flagelliflorous), mostly stolon-like, rooting and with long internodes; figs mostly pedunculate, often with 3 verticillate basal bracts, lateral bracts rather common; internal hairs mostly present. *Staminate flowers* subtended by 2 bracteoles; stamens 1 (or 2). *Tepals* of pistillate flowers connate, saccate (as common in short-styled flowers) or reduced, cupular to annular at the base of the ovary (as common in long-styled flowers) and glabrous (or hairy), or absent. *Style* of long-styled flowers often hairy. *Fruits* mostly brown to blackish, lenticular with a distinct margin (rim) and a ± prominent pseudohilum.

DISTRIBUTION

The section comprises at least 86 species of which 72 occur in the Malesian region, only six of them extend just or far outside this region. Eleven species (Corner, Philos. Trans., Ser. B, 253 (1967) 123–130, 136–157), related to Malesian ones, are endemics of the Solomon Islands. Six species are elements of the Sino-Himalayan region: *F. conglobata* King, *F. griffithii* (Miq.) Miq. and the rheophytic *F. squamosa* Roxb. are confined to this region; *F. obpyramidata*, *F. schwarzii*, and *F. scortechinii* extend to Malesia.

DELIMITATION AND SUBDIVISION

Delimitation — The section is characterized by the positions of the waxy glandular spots, mostly not present in the axils of the basal lateral veins. The indumentum, en-

tirely, largely or partly consists of bristly papillate hairs and more or less abundant submicroscopic capitate pluricellular trichomes, the mostly chartaceous lamina has a dentate margin. The majority of the species are cauliflorous or flagelliflorous. Similarities in the position of the waxy glandular spots and the figs and/or the features of the indumentum are the reasons that some species Corner (Gard. Bull. Singapore 18 (1960) 38, 39) did not include in subsect. *Sycocarpus* (which comprised the majority of the species currently regarded as members of sect. *Sycocarpus*. They are: 1) The two rheophytic species of which the styles of the long-styled flowers are very long, *F. macrostyla* and *F. squamosa*, for which Corner (Gard. Bull. Singapore 18 (1960) 39) created subsect. *Macrostyla*; 2) the Sino-Himalayan *F. griffithii*, for which Corner (Gard. Bull. Singapore 19 (1962) 396) created subsect. *Lepidotus*; and 3) the three species included in subsect. *Auriculisperma* ser. *Cynaroides* (Corner, Gard. Bull. Singapore 18 (1960) 38; Philos. Trans., Ser. B, 253 (1967) 123–130). The first set is placed in subsect. *Macrostyla* (p. 464) and the third set show clear affinities to the *F. calcarata*-group (see p. 393), in most of its features, but not in the fruits, lacking the prominent pseudohilum (see p. 47).

Subdivision — All species except for two truly rheophytic ones be readily accommodated in subsect. *Sycocarpus*. The epiphytic ones are placed in a separate section because of the peculiar features of ovaries and fruits. The rheophytic ones are placed in a separate subsection because of the peculiar features of the ovaries and fruits.

Section Sycocarpus subsection Sycocarpus

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Sycocarpus* Miq. subsect. *Sycocarpus* (Miq.) C.C. Berg, Blumea 49 (2004) 462; Corner, Philos. Trans., Ser. B, 253 (1967) 136; C.C. Berg, Blumea 49 (2004) 162.

Ficus L. sect. *Sycidium* Miq. ser. *Harlandifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 253, 255, 380.

Ficus L. sect. *Sycidium* Miq. ser. *Eusyceifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 257, 381.

Ficus L. sect. *Covellia* (Gasp.) Miq. subsect. *Communiflorae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 293, 382, as *Communisiiflora*.

Ficus L. sect. *Covellia* (Gasp.) Miq. subsect. *Communiflorae* Sata ser. *Longetuberculatae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 293, 382. — *Ficus* L. subg. *Ficus* sect. *Sycocarpus* Miq. ser. *Longetuberculatae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 294, 382; Corner, Gard. Bull. Singapore 17 (1960) 40.

Ficus L. sect. *Covellia* (Gasp.) Miq. subsect. *Communiflorae* Sata ser. *Tuberculifasciculatae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 293, 382. — *Ficus* L. subg. *Ficus* sect. *Sycocarpus* Miq. ser. *Tuberculifasciculatae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 298, 383; Corner, Gard. Bull. Singapore 17 (1960) 40. — *Ficus* L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Sycocarpus* (Miq.) Corner ser. *Tuberculifasciculatae* Sata subser. *Tuberculifasciculatae* Corner, Gard. Bull. Singapore 18 (1960) 41.

Ficus L. sect. *Pseudopalma* Elmer subsect. *Covelliae–pseudopalmae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 320, 384; Corner, Gard. Bull. Singapore 18 (1960) 39.

Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Auriculisperma* Corner, Gard. Bull. Singapore 18 (1960) 38. — *Ficus* L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Auriculisperma* Corner ser. *Cynaroides* Corner, Gard. Bull. Singapore 18 (1960) 38.

Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Sycocarpus* (Miq.) Corner ser. *Tuberculifasciculatae* Sata subser. *Axillares* Corner, Gard. Bull. Singapore 18 (1960) 40.
Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Sycocarpus* (Miq.) Corner ser. *Tuberculifasciculatae* Sata subser. *Calopilinae* Corner, Gard. Bull. Singapore 18 (1960) 40.
Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Sycocarpus* (Miq.) Corner ser. *Tuberculifasciculatae* Sata subser. *Congestae* Corner, Gard. Bull. Singapore 18 (1960) 40.
Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Sycocarpus* (Miq.) Corner ser. *Tuberculifasciculatae* Sata subser. *Hispidae* Corner, Gard. Bull. Singapore 18 (1960) 40.
Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Sycocarpus* (Miq.) Corner ser. *Tuberculifasciculatae* Sata subser. *Praestantes* Corner, Gard. Bull. Singapore 18 (1960) 40.
Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Sycocarpus* (Miq.) Corner ser. *Tuberculifasciculatae* Sata subser. *Fulvidulae* Corner, Gard. Bull. Singapore 18 (1960) 41.
Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Sycocarpus* (Miq.) Corner ser. *Tuberculifasciculatae* Sata subser. *Geocarpicae* Corner, Gard. Bull. Singapore 18 (1960) 41.
Ficus L. subg. *Ficus* sect. *Sycocarpus* Miq. subsect. *Lepidotus* Corner, Gard. Bull. Singapore 19 (1962) 396.

Trees or shrubs, if rheophytic, then facultatively so. *Leaves* spirally arranged, (sub)-distichous or (sub)opposite; lamina symmetric or asymmetric; cystoliths only beneath or also above; waxy glands in the axils of lateral veins in the middle of the lamina, also (or only) in the axils of the basal lateral veins, or additional ones in the axils of branches or furcations of lateral veins. *Figs* axillary, cauliflorous, or flagelliflorous; lateral bracts present or absent; internal hairs usually present. *Stamens* 1 (or 2). *Perianth* of pistillate flowers usually well developed, usually enclosing the ovary of short-styled flowers and at least the base of the ovary of long-styled flowers, rarely rudimentary or absent; ovary glabrous; styles of long-styled flowers, short (up to 3 mm long), mostly hairy, but the hairs not deflexed.

DISTRIBUTION

The subsection ranges from north-eastern India to northern Australia and the Solomon Islands. It comprises 84 species of which 72 found in Malesia; 10 species (see Corner 1967: 122, 137) are endemics of the Solomon Islands. The subsection is most speciose in New Guinea, with 28 species of which 22 endemic. Second in species richness is Borneo with 22 species of which 12 or 13 endemic (in the northern part of the island). The Philippines, Celebes, the Moluccas, and Sumatra are about equally rich, with 10–14 species, of which 4 or 5 species endemic in each of these areas. The section is poorly represented in Java and the Lesser Sunda Islands.

Ficus hispida and *F. septica* are found throughout the Malesian region (and extend outside); *F. fistulosa* and *F. lepicarpa* are found in the greater part of the Malesian region (and extend outside as well). The other species have (much) more restricted distribution.

The majority of the species are components of lowland vegetations, often riparian forest. Four species (*F. iodotricha*, *F. serraria*, *F. sublimbata*, and *F. tarennifolia*) are montane and 7 others (*F. decipiens*, *F. hypogaea*, *F. morobensis*, *F. parvibracteata*, *F. rubrosyce*, *F. scopulifera*, and *F. ternatana*) can be regarded as submontane species. At least 12 other species range to altitudes above 1500 m, even up to 2300 m. Several

species, in particular the most widespread ones, *F. fistulosa*, *F. hispida*, and *F. septica* are common in secondary vegetation (and open country).

MORPHOLOGY

Habit — The majority of the species are small to medium-sized understorey trees, most of them up to c. 15 m tall, some up to 20 m tall, few (*F. congesta* and *F. septica*) sometimes up to 25 m tall. About 12 species are shrubs or treelets becoming not taller than 5 or 6 m; some of them are monocaul or sparingly branched. The narrow-leaved *F. ixoroides* may be facultatively rheophytic, the same might be the case with the (broader-leaved) *F. albomaculata*. Flagelliflorous species may form satellite individuals by the apices of the stolons growing upwards and becoming leafy. Such individuals of co-occuring species often contribute to mixed collections.

Indumentum — The indumentum consists predominantly of bristly hairs, more or less clearly papillate and often with clearly swollen bases. These hairs are mostly brown, varying to purplish (or blackish as in *F. saurauioides*) or to whitish. They are patent to appressed, long to short, abundant to (very) sparse. These hairs can be intermixed with shorter and softer ones. Submicroscopic pluricellular and ellipsoid- to globose-capitate trichomes are present in all species, often abundant on the lower surface of the lamina. They are whitish, but on the (main) veins often dark brown.

The bristly hairs as described above also occur in other subgenera, clearly so in the *F. conocephalifolia*-group of sect. *Sycidium*, in which the hairs can also be purplish. But the characteristic submicroscopic capitate trichomes are lacking (or sparse).

Leaves — The phyllotaxy is variable in the section and often also within species. It varies from spirally arranged to subopposite to (sub)distichous, the latter state often on the ultimate branches. The variation of the symmetry of the lamina is to some extent related to the phyllotaxy. The symmetric lamina tend to be linked to the spirally arrangement of the leaves and the asymmetric one to distichous arrangement. But all combinations and variations occur within the section or within species. In species of small (monocaul or sparingly branched) trees, as *F. calcarata*, *F. cryptosyce*, *F. decipiens*, and *F. multistipularis*, the spirally arranged leaves are ± tufted and the lamina always symmetric.

The margin of the lamina is mostly dentate or denticulate, entire margins are found in only few species. The tertiary venation is scalariform in the majority of the species, transitions to subreticulate tertiary venation is found in some species, and clearly reticulate tertiary venation is found in *F. carpenteriana* and *F. ixoroides*.

The lamina is chartaceous in the majority of the species; in 20–25 species it can be or is subcoriaceous. The lamina is coriaceous in *F. macrostyla* and is mostly so in *F. septica*. In c. 40% of the species the lamina is scabrous only above or on both sides.

Waxy glandular spots — Waxy glands are always present in the majority (c. 70%) of the species. Waxy glands are absent on the leaves of six (or possibly eight) species. They are present or absent on the leaves of 17 species, with a tendency to be present on relatively large leaves. If present on the lamina, they occur in the axils of the lateral veins of (or above) the middle part of the lamina. These axils can have slit-shaped

extensions which contain the glands. In some species, they also occur in the axils of the basal lateral veins, bilaterally or unilaterally. In species of which the lateral veins are branched or furcate, small waxy glands are also found in the axils of the branches and/or in the furcations.

Position of the figs — In the majority of the species, the figs are not borne in the leaf axils. However, in a relatively small number of species the figs are only borne axillary or in some predominantly so. In the other species the figs are only borne below the leaves, on the branches and the trunk, but in some of these species (such as *F. hispida*) the figs also occur axillary. In this group two major categories can be distinguished: a) essentially cauliflorous species; and b) essentially flagelliflorous (or geocarpic) species. In the former group the figs are borne on branchlets which are leafless or may in some species form terminally (usually small) leaves. However, stipules are present, and often (sub)persistent. The internodes of the fig-bearing branchlets can be very short, forming spurs or by branching woody tubercles, with clusters of figs. The fig-bearing branches can be elongate with short internodes. In these cases the fig-bearing branches are borne on the older wood, often only on the main branches and/or the trunk. In some species (*F. cereicarpa* and *F. francisci*, and possibly also *F. porrecta*) such branches are (always or mostly?) confined to the base of the trunk and end in the soil or litter. In some species the fig-bearing branches get longer internodes when reaching the soil and become trailing. In the group of flagelliflorous species the fig-bearing branches are formed at the base of the trunk and have long internodes. They are stolon-like and can become many meters long; the figs are more or less hidden in the litter. In some of the species with this kind of fig-bearing branches, slender branches with long internodes may also be formed on the trunk and main branches. The stolons may bear the figs solitary or in pairs on the nodes or (also) on short lateral branchlets with short or very short internodes. In (some) flagelliflorous species the stolons may become ± orthotropic and form normal leaves, as often in *F. uncinata*. Due to scarcity of material and lack of (precise) label data it is often not possible to get an accurate perception of the way the figs are borne and infer infraspecific variation with regard to this character. Moreover, it is not always certain whether leafy parts of a collection and parts of stolons belong to the same individual.

Fig receptacle — The majority of the species (c. 35) have receptacles between 1 and 2 cm diam. when dry. In c. 10 species the receptacle is smaller, up to 1 cm diam., and in c. 20 species it is between 2 and 3 cm diam.; in *F. cassidyana* it is 3–5 cm diam. when dry.

The colour of mature syconia is often yellowish or reddish, it is less commonly purplish, but generally with a brownish hue. There are remarkably many species for which the colour is not noted.

The internal (or interfloral) hairs vary from abundantly to sparsely present to absent. The latter two states are often found in the same species.

Flowers — The perianth of the pistillate flower is colourless and the ovary red-brown. The tepals are connate. The perianth may be tubular and enclose the ovary or also with

a narrow tubular extension enveloping the lower part of the style, it may cover only part of the ovary, it may be a small collar-like structure at the base (of the stipe) of the ovary, or even absent as in *F. uncinata* (Fig. 20i). The dimensions of the perianth may vary within species. In the perianth of the short-styled flowers the reduction in size is often less or less common. Dimorphy of flowers as described is characteristic for the subsection. The ovaries are often stipitate. The style can be hairy or glabrous, even in the same species. The staminate flowers mostly have a single stamen, but two stamens occur, as in *F. calopilina*.

Fruits — The fruits are lenticular, often ± tuberculate on the sides. They mostly have a prominent pseudohilum and a distinct keel.

DELIMITATION AND SUBDIVISION

Delimitation — This section lacks the adaptations of the fruits to the rheophytic life-form as found in subsect. *Macrostyla*.

Subdivision — Corner (Gard. Bull. Singapore 18 (1960) 36) proposed a subdivision of subsection, currently section *Sycocarpus* into two series: ser. *Longetuberculatae*, comprising a limited number of species having cystoliths both on the upper and lower surface of the lamina, including *F. botryocarpa*, *F. cassidyana*, and *F. ribes*, and ser. *Tuberculifasciculatae*, comprising the majority of the species having cystoliths only on the lower surface. The group of species with amphigenous cystoliths is not homogeneous and shows in various characters a wide range of features with *F. ribes* and *F. cassidyana* at the extremes of the spectrum. On the other hand, *F. ribes* shows such clear affinities to *F. arfakensis* and *F. scortechinii*, two taxa with hypogenous cystoliths, that one could consider to reduce them to subspecies. *Ficus vrieseana* may sometimes have cystoliths also present on the upper surface. The cystolith character appears not to reflect natural relationships and can hardly be regarded as constant, even not within species. The group with hypogenous cystoliths was subdivided into 8 subseries (Corner 1960) based on a number of characters such as the arrangement of the leaves, the length of the petiole, the presence of certain types of hairs, the colour of hairs, the position of the figs, the presence/absence of lateral bracts on the fig receptacle, the presence/absence and abundance of internal hairs, etc., in general characters which are variable, often even within species. It appears not to be possible to propose a satisfactory subdivision of the section *Sycocarpus* because of the lack of clear discontinuities in the variation. A practical grouping of the species is possible on the basis of the position of the figs on the tree:

A. 'Axillares' with the figs only or predominantly axillary;
B. 'Flagelliflorae' with the figs only or predominantly flagelliflorous (or geocarpic); and
C. 'Cauliflorae' with the figs only cauliflorous or partly cauliflorous (in combination with flagelliflory and/or axillary position of the figs).

These groups partly comprise assemblages of related species, partly species which are more or less clearly related to those of other 'practical' categories. It is noteworthy that vegetative characters can often be used to key out the taxa in the groups A and B, whereas for keying out the taxa of group C characters of the figs are more often needed.

A. 'Axillares' — Two groups of species with the figs confined to the leaf axils or with the figs only occasionally cauliflorous can be recognized.

A1. *Ficus calcarata*-group — This group comprises species with small and usually sparingly branched trees, the stipules are relatively long and (sub)persistent, the hairs are often (dark) brown and stiff, often ± setose, and the figs are axillary and sessile or short-pedunculate. It includes: *F. biakensis*, *F. calcarata*, *F. carpenteriana*, *F. cryptosyce*, *F. decipiens*, *F. latimarginata*, *F. multistipularis*, and *F. nana*. This group may constitute a natural entity. In *F. cryptosyce* the figs are borne on short spurs, indicating a link to cauliflory. The small number of collections could indicate that these species are rare (or generally overlooked?) and/or have small ranges of distribution. *Ficus calcarata* is locally common. This group is concentrated in the central part of the Malesian region, from the Philippines to western New Guinea.

A2. *Ficus lepicarpa*-group — This group consists of four related species, *F. benguetensis*, *F. ixoroides*, *F. lepicarpa*, and *F. ternatana*. They produce small to medium-sized trees with caducous or subpersistent stipules, are less conspicuously hairy than those of the former group, have prominent scars of the leaves and persistent small conical axillary 'buds' (consisting of free or fused prophylls?). This group might be related to the main group of the 'Axillares' through *F. carpenteriana*. On the other hand it shows weak tendencies towards cauliflory and can, therefore, also be linked to the *F. congesta*-group, in particular to *F. fistulosa*, which also has the persistent axillary 'buds'. The distribution of this group can be linked to the main group of the 'Axillares'. Only *F. lepicarpa* is widely distributed, extending to the western part of the Malesian region.

The 'Axillares' group largely coincides, in a broad sense, with subseries *Axillares* Corner (1960). These species (and some other species, as *F. fistulosa* and *F. septica*), being essentially cauliflorous species, but with the figs also in the leaf axils.

B. 'Flagelliflorae' — This group is certainly not a natural entity but consists of several assemblages of presumably related taxa. In some groups flagelliflory (geocarpy) is apparently obligatory, all individuals producing the figs on rooting stolons departing from the base of the trunk, in others flagelliflory occurs in combination with cauliflory; in this case the fig-bearing branches are long and relatively slender, or parts reaching the soil become slender. Flagelliflory may also occur in combination with cauliflory on short branches and even with an axillary position of the figs. The species have small ranges of distribution. The assemblages of (presumably) related species are:

B1. *Ficus stolonifera*-group — This group comprises species of shrubs to medium-sized trees of which the leaves vary from small to large, the base of the lamina may be very asymmetric and the apex caudate, part of the tertiary venation runs perpendicular to the midrib (veins running horizontally), the petiole is short, and the fig receptacle is small and bears lateral bracts. All or most individuals are entirely or predominantly flagelliflorous. This group comprises: *F. beccarii*, *F. geocharis*, *F. megaleia*, *F. stolonifera*, and *F. uncinata*. The group is concentrated in N Borneo and extends to the Malay Peninsula (with *F. uncinata*).

B2. *Ficus geocarpa*-group — This group comprises species of small to medium-sized trees, the lamina is medium-sized to large, often slightly unequal-sided to equal-sided and scabrous above, the petiole is short to long (up to 9 cm), variable in length, all or most individuals are flagelliflorous, the figs receptacle is medium-sized to small, without or with few lateral bracts. This group includes: *F. geocarpa*, *F. hypogaea*, *F. sulcata*, and *F. vrieseana*. The group is more widespread than the previous one and found in the western and central part of the Malesian region: Sumatra, Java, Philippines, Celebes. The cauliflorous *F. gilapong* (from the Malay Peninsula and Sumatra) is closely related to *F. hypogaea* (from Sumatra).

B3. *Ficus ribes*-group — This group comprises species of small to medium-sized trees, the lamina is small, mostly 5–15 cm long, several species have cystoliths above and beneath, the fig receptacle is small, mostly 0.5–1 cm diam., without lateral bracts. Flagelliflory varies from occasional to frequent, the fig-bearing branches are slender. The group includes: *F. arfakensis*, *F. cuneata*, *F. pleyteana*, *F. ribes*, *F. scopulifera*, and *F. serraria*. The group occurs throughout the Malesian region. A more natural assemblage of species comprises the cauliflorous *F. scortechinii* and *F. schwarzii* as well and is readily linked up with the next group.

B4. *Ficus subterranea*-group — This group comprises species of shrubs or small trees with (rather) small laminas, the stipules and various other parts are glabrous, the fig receptacle is (rather) small, and internal hairs are absent or sparse. This group includes: *F. rubrosyce*, *F. subterranea*, and *F. tarennifolia*. The group is found in Borneo and Sumatra, and is partly associated with montane habitats. *Ficus subterranea* is distinct by the presence of lateral bracts on the fig receptacle. A more natural assemblage includes *F. fistulosa* and *F. schwarzii* and appears to be part of a larger group of taxa with small leaves and figs (*F. ribes*-group).

Various species — The flagelliflorous species *F. iodotricha* and *F. subcongesta*, both occurring in the eastern(-most) part of the Malesian region, are systematically more isolated and affiliated to the cauliflorous *F. pachyrrhachis*-group and *F. congesta*-group, respectively. They are related to several flagelliflorous taxa from the Solomon Islands (see Corner, Philos. Trans., Ser. B, 253 (1967) 136–157). The fig receptacles of *F. iodotricha* are larger than those of the other Malesian flagelliflorous species.

C. 'Cauliflorae' — Two major assemblages of related species can be recognized. Other species can be grouped in small entities, are more or less intermediate, or are linked to groups of flagelliflorous species.

C1. *Ficus pachyrrhachis*-group — This group is a prominent entity of species with small to medium-sized trees. The lamina is mostly medium-sized to large (up to c. 40 cm) and scabrous above, the petiole is in most species relatively long and on the same twig mostly variable in length, the stipules are often relatively long and subpersistent. The fig receptacle is often relatively large, and has in some species lateral bracts. The indumentum is often dark brown, and in some species (as *F. praestans*) setose. The group comprises the following cauliflorous Malesian species: *F. adelpha*, *F. bernaysii*, *F. calopilina*, *F. d'albertisii*, *F. hahliana*, *F. morobensis*, *F. novahibernica*, *F. pachyrrhachis*, *F. papuana*, *F. porrecta*, *F. praestans*, and *F. sublimbata*. For a more natural group the flagelliflorous *F. iodotricha* and some species from the Solomon Islands (see Corner, Philos. Trans., Ser. B, 253 (1967) 136–157) are to be included. The *F. pachyrrhachis*-group, is concentrated in the eastern-most part of the Malesian region (eastern New Guinea, New Britain, and New Ireland), and extends to the Solomon Islands. The ranges of distribution of the species are small. The coherence of features indicates that the *F. pachyrrhachis*-group is a natural one. Many species of this group are represented by too few collections to prepare reliable descriptions and several collections of representatives of this group could not yet be named. The majority of the species of this group have been ranked in subser. *Calopilinae* by Corner (1960, 1965). The flagelliflorous species with small figs, *F. vrieseana* (from Java and Sumatra), was placed in the same subseries (Corner 1960, 1965), but is currently clustered with some other West Malesian flagelliflorous species. *Ficus praestans* was placed in subser. *Praestantes* by Corner (1960, 1965). Some species in the western part of the Malesian region, *F. cassidyana* (Philippines), *F. limosa* (Borneo), *F. nota* (Philippines), and *F. obpyramidata* (Malay Peninsula to Myanmar), show more or less pronounced affinities to representatives of the *F. pachyrrhachis*-group, such as in the dimensions of the fig receptacle, the indumentum, and the persistent stipules. *Ficus cassidyana* is distinct by the presence of cystoliths in the epidermis of the upper surface of the lamina. On the other hand, these species, as well as some of the *F. pachyrrhachis*-group, such as *F. adelpha* and *F. hahliana*, can also be linked to the *F. congesta*-group. Corner (1960, 1965) ranked these two species of this intermediate group in subser. *Calopilinae*, and *F. cassidyana* in ser. *Longetuberculatae*.

C2. *Ficus congesta*-group — This group comprises species of shrubs to medium-sized trees with medium-sized to small laminas. The indumentum is less conspicuous than in the *pachyrrhachis*-group, brown to whitish, the stipules are also smaller and mostly caducous, the fig receptacles are medium-sized and mostly without lateral bracts. The group includes: *F. botryocarpa*, *F. dimorpha*, *F. fistulosa*, *F. satterthwaitei*, *F. subcongesta*, and less closely *F. hispida* and *F. septica*. *Ficus botryocarpa* is distinct in the amphigenous cystoliths. *Ficus hispida* is distinct in the predominantly (sub)opposite arrangement of the leaves. The *F. congesta*-group is associated with central and western parts of the Malesian region, some species have small ranges of distribution, others, *F. botryocarpa*, *F. fistulosa*, *F. hispida*, and *F. septica*, large(r) ones. The majority of the species of this group have been ranked in subser. *Congestae* by Corner (1960, 1965), but *F. botryocarpa* in ser. *Longetuberculatae* and *F. hispida* in subser. *Hispidae*.

Various species — *Ficus cereicarpa* and *F. francisci*, both from Borneo, constitute a rather distinct group, partly because of the villous indumentum. The leaves are large to medium-sized, the petioles and stipules long. The construction of the fig-bearing branchlets, stout and terminally much-branched, is characteristic, but similar to that of *F. porrecta* of the *F. pachyrrhachis*-group. Corner (1960) ranked the two species in subser. *Fulvidulae*, together with *F. gilapong* (clearly related to the flagelliflorous *F. hypogaea*), the flagelliflorous *F. treubii*, and *F. virescens* (from Borneo). Several features, as the type of fig-bearing branches, the long petiole, and the smooth upper surface of the lamina suggest that *F. virescens* is related to *F. cereicarpa* and *F. francisci*, but it is less evident for the other two species. *Ficus scortechinii* and *F. schwarzii*, two species with small leaves and small figs, are related to the flagelliflorous *F. ribes*-group.

31. **Ficus adelpha** Lauterb. & K. Schum.

Ficus adelpha Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 284; Diels, Bot. Jahrb. Syst. 67 (1935) 213; Corner. Gard. Bull. Singapore 21 (1965) 87.
Ficus platysycia Diels, Bot. Jahrb. Syst. 67 (1935) 213.

Tree up to 15 m tall. *Leafy twigs* 2–4 mm thick, brown hirtellous or strigose, the longer stiff hairs intermixed with shorter and softer white hairs, with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* (sub)distichous to spirally arranged (or subopposite); lamina oblong to subobovate, (4–)8–28 by (1.5–)3.5–9 cm, asymmetric, chartaceous, apex acuminate, base rounded to subcordate at the broad side, cuneate to obtuse at the narrow side, margin denticulate to subentire, often ± revolute; upper surface puberulous to hispidulous, scabrous, lower surface brown hirtellous to subhispid on the veins, the longer stiff hairs intermixed with (sparse) shorter and softer white hairs, ± scabrous, cystoliths only beneath; lateral veins (5–)7–11 pairs, sometimes furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of some lateral veins in the middle part of the lamina; petiole 0.5–1.5(–2) cm long, brownish hirtellous to subhirsute, the longer stiff hairs intermixed with shorter and softer white hairs, the epidermis persistent; stipules 0.5–1.8 cm long, brown strigose, caducous. *Figs* ramiflorous on up to 20 cm long branched branchlets, cauliflorous on the trunk and main branches, the internodes up to 1 cm long, the nodes with short brown strigillose stipules; peduncle 0.2–2 cm long; basal bracts 3, verticillate, 1.5–2 mm long; receptacle subglobose to depressed-globose, often 1–2 mm long stipitate, 0.8–1.2 cm diam. when dry, c. 2.5 (?) cm diam. when fresh, whitish to dark brown subhispid, ± scabrous, without (or with some) lateral bracts, hardly ribbed, colour at maturity unknown, apex convex to flat; ostiole 2–4 mm diam., surrounded by 5 apical bracts, slightly prominent; internal hairs sparse to abundant, white to brown.

Distribution — *Malesia*: New Guinea.

Habitat — Forest, at altitudes up to c. 1350 m.

Note — This species can be readily recognized by the dark-hairy small figs on branchlets with short internodes and brown strigillose stipules.

32. Ficus albomaculata C.C. Berg

Ficus albomaculata C.C. Berg, Blumea 49 (2004) 165.

Tree up to 8 m tall. *Leafy twigs* 3–4 mm thick, whitish to slightly brownish villous to sericeous, with small nodal waxy glands; internodes hollow, up to 1 cm long; periderm persistent. *Leaves* spirally arranged, ± tufted; lamina oblong to subobovate to oblanceolate, 14–22 by 3.5–6.5 cm, almost symmetric, chartaceous, often drying pale brown beneath, apex acuminate, base cuneate to obtuse, margin (sub)entire; upper surface sparsely white villous on the midrib glabrescent or glabrous, smooth, lower surface white (sub)sericeous to appressed-puberulous on the veins, cystoliths only beneath, smooth; lateral veins 7–12 pairs, none of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands absent (or obscure?); petiole (1.5–)2–7 cm long, whitish (sub)villous, the epidermis persistent; stipules 2–2.5 cm long, whitish villous to subsericeous, caducous or subpersistent. *Figs* cauliflorous on up to 7 cm long branched stout branchlets on the trunk; peduncle 0.8–1.2 cm, densely brown puberulous to tomentose, the epidermis flaking off; basal bracts 3, verticillate, 3–5 mm long; receptacle turbinate to obovoid to subglobose, 1–1.3 cm diam. when dry, brown puberulous, glabrescent or glabrous, with some conspicuous (whitish) lenticels, without lateral bracts, towards the apex 5- or 6-ribbed, yellow-brown at maturity, apex ± convex, ostiole c. 3 mm diam., surrounded by 5 or 6 raised and hairy apical bracts; internal hairs abundant, whitish to pale brown.

Distribution — *Malesia*: Borneo (Sarawak).

Habitat — Lowland streamside forest.

Note — Many features of this species suggest close relationship to *F. virescens*. It differs clearly in the indumentum. The short internodes might prove to be another consistent differentiation character. The indumentum and figs also show affinities to *F. cereicarpa*, from which it is clearly distinct in the base of the lamina and the absence of waxy glands.

33. Ficus arfakensis King

Ficus arfakensis King, Sp. Ficus 2 (1888) 104, t. 133; Diels, Bot. Jahrb. Syst. 67 (1935) 215; Summerh., J. Arnold Arbor. 22 (1941) 100; Corner, Gard. Bull. Singapore 21 (1965) 94.

Ficus aruensis King, Sp. Ficus 2 (1888) 175, t. 222 (p.p. *foliorum*, alt. p. = *F. wassa* Roxb.); Diels, Bot. Jahrb. Syst. 67 (1935) 188; Corner, Gard. Bull. Singapore 21 (1965) 97. — Type: *Beccari s.n.* (R. Ist. Fir. *9316*, *9316A*, *9316B*) (FI n.v.), Indonesia, Moluccas, Aru Islands, consists of leaves of *F. arfakensis* King (1888) and figs of *F. wassa* Roxburgh (1832), as evident from the plate; the latter element is here designated as lectotype.

Ficus hylophila Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 283; Diels, Bot. Jahrb. Syst. 67 (1935) 211; Summerh., J. Arnold Arbor. 22 (1941) 98.

Ficus stenothyrsa Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 285; Diels, Bot. Jahrb. Syst. 67 (1935) 188.

Ficus palustris Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 288; Diels, Bot. Jahrb. Syst. 67 (1935) 211.

Ficus tristipula Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 249; Diels, Bot. Jahrb. Syst. 67 (1935) 195.

Ficus macrothyrsa Corner var. *lancifolia* Corner, Philos. Trans., Ser. B, 253 (1967) 156, t. 69.

Tree up to 10 m tall. *Leafy twigs* 1.5–3 mm thick, brown(ish) to whitish appressed-puberulous to strigillose, sometimes with small nodal waxy glands; internodes hollow or solid with ample pith; periderm persistent. *Leaves* (sub)distichous, sometimes subopposite; lamina (ob)lanceolate to subobovate to oblong, 3–16(–25) by (0.5–)2–6(–9.5) cm, slightly to distinctly asymmetric, chartaceous, apex acuminate to caudate, base cuneate to obtuse, margin denticulate (at least) towards the apex; upper surface strigillose on the whole surface or only the midrib or subglabrous, smooth, lower surface sparsely to rather densely brown(ish) or whitish strigillose on the (main) veins, smooth, cystoliths only beneath; lateral veins (4–)6–10(–12) pairs, none of them branched or furcate far from the margin, the basal ones weakly developed, 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 0.4–1.2(–2) cm long, brown(ish) strigillose, the epidermis flaking off; stipules 0.4–1.5 cm long, brown(ish) strigillose, caducous or subpersistent. *Figs* cauliflorous to flagelliflorous, mostly on (dense) clusters of rather slender to stout leafless branchlets up to 5 cm long on the trunk (and main branches), those on the base of the trunk becoming up to 3 m long stolons, sometimes on woody tubercles (very short branched leafless branchlets); peduncle 0.2–1.5 cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose to depressed-globose to subpyriform to (sub)ovoid, dry 0.7–1.3 cm diam. when dry, 1–2(–2.5) cm diam. when fresh, (sub)glabrous, non-stipitate (or up to 0.2 cm long stipitate), (faintly) ribbed, without lateral bracts, yellow or red-brown at maturity, apex flat to concave, ostiole 2–3 mm diam., surrounded by 5 (or 6) erect apical bracts; internal hairs absent.

Distribution — Solomon Islands; in *Malesia*: Moluccas (Aru Islands), New Guinea.

Habitat — Forest; at altitudes up to 1600 m.

Notes — 1. This species, *F. scortechinii* and *F. ribes* constitute a cluster of very closely related taxa, currently treated as species, but they could be regarded as subspecies. *Ficus arfakensis* slightly differs from *F. scortechinii* in commonly exfoliating epidermis of the petioles and the mostly caducous stipules, and the often longer fig-bearing branchlets. *Ficus ribes* is distinct by the presence of cystoliths in the epidermis of both the upper and the lower surface of the lamina, and not only on the lower surface as in the other two species. The fact that for these three entities three different pollinators have been recorded (Wiebes, The Indo-Australian Agaoninae (pollinators of figs), 1994) supports the (provisional) treatment of these three taxa at the specific level.

2. The species is clearly related to *F. macrothyrsa* Corner from the Solomon Islands, which is distinct, e.g., in the larger and broader lamina in which the lateral veins are often furcate far from the margin.

34. Ficus beccarii King

Ficus beccarii King, Sp. Ficus 2 (1888) 102, t. 130; Merr., Enum. Born. (1921) 221; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 20; Wayside Trees (1940) 280; Gard. Bull. Singapore 21 (1965) 92; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 261.

Ficus beccarii King var. *asymmetrica* Corner, Gard. Bull. Singapore 18 (1960) 60.

Ficus beccarii King var. *latifolia* Corner, Gard. Bull. Singapore 18 (1960) 60.

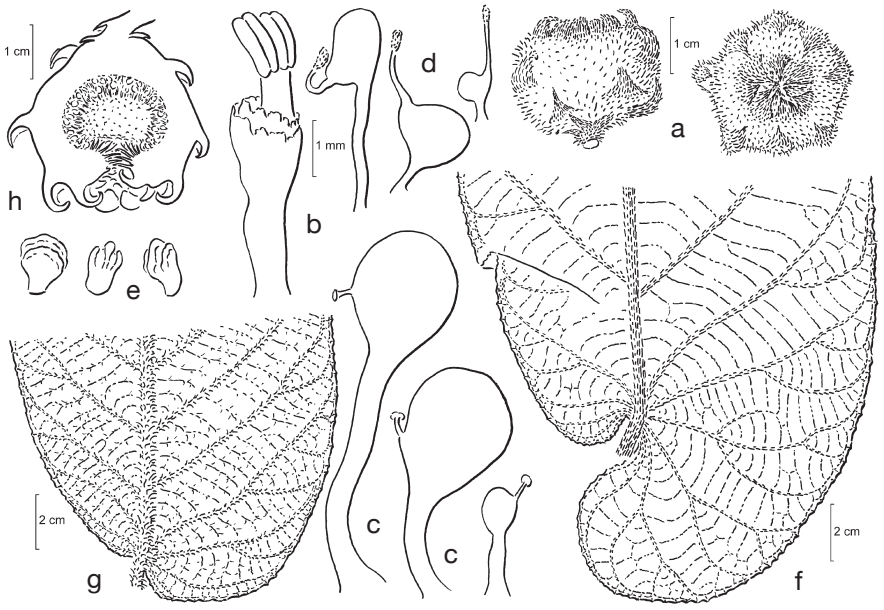


Fig. 78. a–e: *Ficus beccarii* King. a. Figs; b. staminate flower; c. short-styled flowers; d. long-styled flowers; e. fruits. — f. *Ficus megaleia* Corner. Base of leaf. — g, h: *Ficus uncinata* (King) Becc. g. Base of leaf; h. fig (all: collections used unknown). From Philos. Trans., Ser. B, 281 (1978) 393.

Shrub or treelet up 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–)15–35(–40) by (1.5–)3–11 cm, ± asymmetric (to almost symmetric), chartaceous, apex caudate (the apex of the acumen often filiform), base cuneate to subcordate (to cordate), margin entire; upper surface glabrous (also the midrib), smooth, lower surface yellowish strigose to strigillose on the veins, smooth, cystoliths only beneath; lateral veins 5–13 pairs (in the lower part more closely together than more upwards), none of them branched or furcate far 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 0.5–1 cm long, yellowish strig(ill)ose, the epidermis persistent; stipules 2–4 cm long, caudate and margin often inflexed, yellowish strigose to subsericeous, (sub)persistent. *Figs* flagelliflorous on up to 3 m long slender stolons with up to 10 cm long internodes; subsessile or with a peduncle up to 0.5 cm long; basal bracts 3 and verticillate or up to 6 and subverticillate, 3–4 mm long; receptacle subglobose, 1–2 cm diam. when dry, brown hirtellous, with ± inflexed lateral bracts, reddish at maturity, apex convex to flat, ostiole 3–4 mm diam., surrounded by a rosette of apical bracts; internal hairs absent. — **Fig. 78a–e.**

Distribution — *Malesia*: Malay Peninsula (Trengganu and Johore) and Borneo.

Habitat — Primary and disturbed forest; at altitudes up to 1300(–2000) m.

Note — This species is rather uniform in most features, but it has two forms with regard to the shape of the lamina: one relatively narrow (up to c. 5 cm broad), the other up to 10 cm broad (var. *latifolia*).

35. Ficus benguetensis Merr.

Ficus benguetensis Merr., Publ. Gov. Lab. Philipp. 29 (1905) 10; Elmer, Leafl. Philipp. Bot. 1 (1906) 54, 191; 1 (1907) 250; 2 (1908) 542; 4 (1911) 1256; 7 (1914) 2414 (as *F. carpenteriana* Elmer); Merr., Enum. Philipp. Flow. Pl. 2 (1923) 46; Elmer, Leafl. Philipp. Bot. 9 (1937) 3467; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 268; Corner, Gard. Bull. Singapore 21 (1965) 89. — *Ficus fistulosa* Reinw. ex Blume forma *benguetensis* (Merr.) Tang S. Liu & J.C. Liao, Bull. Exp. Forest Natl. Taiwan Univ. 114 (1974) 68.

Ficus benguetensis Merr. var. *leytensis* Elmer, Leafl. Philipp. Bot. 1 (1906) 194. — *Ficus benguetensis* Merr. forma *leytensis* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 269.

Ficus benguetensis Merr. var. *negrosensis* Elmer, Leafl. Philipp. Bot. 2 (1908) 542. — *Ficus benguetensis* Merr. forma *negrosensis* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 269.

Ficus cuernosensis Elmer, Leafl. Philipp. Bot. 2 (1908) 545; 4 (1911) 1265; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 50; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 313.

Ficus peabodyi Elmer, Leafl. Philipp. Bot. 4 (1912) 1267; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 61; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 312.

Ficus laevicarpa Elmer, Leafl. Philipp. Bot. 4 (1912) 1395; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 271.

Ficus wenzelii Merr., Philipp. J. Sci., Bot. 8 (1913) 367; Enum. Philipp. Flow. Pl. 2 (1923) 68; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 270.

Ficus miyagii Koidz., Bot. Mag. Tokyo 27 (1913) 184.

Ficus urdanetensis Elmer, Leafl. Philipp. Bot. 7 (1914) 2413. — *Ficus benguetensis* Merr. forma *urdanetensis* (Elmer) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 269.

?*Ficus ochobiensis* Hayata, Ic. Pl. Formos. 7 (1918) 36; 8 (1919) 127, f. 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 61.

Ficus kotoensis Hayata, Ic. Pl. Formos. 8 (1919) 126, f. 35. — *Ficus harlandii* Benth. var. *kotoensis* (Hayata) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 29.

Ficus maquilingensis Elmer, Leafl. Philipp. Bot. 8 (1919) 3094.

Ficus harlandii Benth. var. *grandifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 31.

Ficus cuernosensis Elmer var. *elongata* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 313.

Ficus harlandii auct. non Benth.: F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 461; Sata, J. Soc. Trop. Agr. Taiwan 6 (1934) 21, incl. var. *kotoensis* (Hayata) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 29.

Ficus coronata auct. non Blume: Sasaki, List Pl. Formos. (1928) 152; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 30.

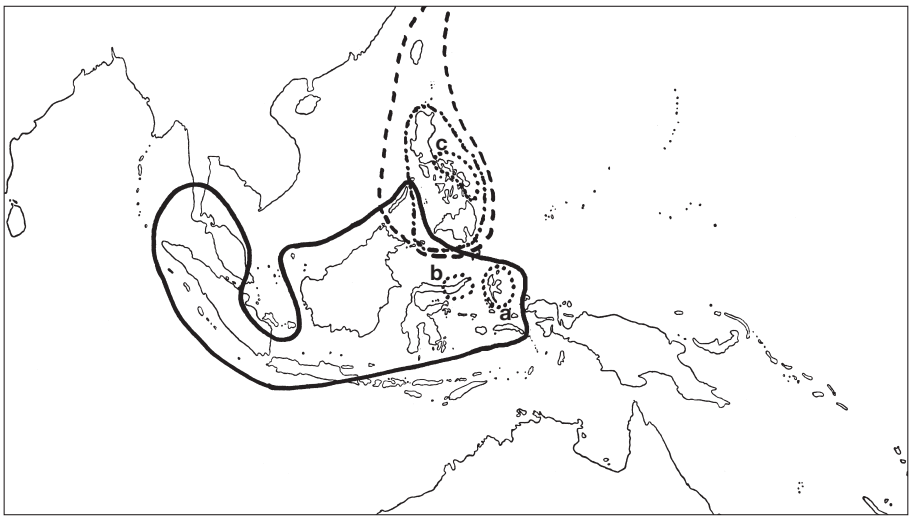
Shrub or tree up to 15 m tall. *Leafy twigs* 2–4 mm thick, brown to whitish hirtellous to strigillose (or glabrous), nodal waxy glands usually absent, occasionally present; internodes hollow; periderm ± flaking off; older twigs usually with prominent scars of leaves and figs; often small conical 'buds' in the leaf axils and on the nodes below the leaves. *Leaves* spirally arranged, (sub)opposite or (sub)distichous; lamina oblong to subobovate (to elliptic or to subovate), (3.5–)8–15(–28) by (1.5–)3–8(–17) cm, ± asymmetric (to almost symmetric), chartaceous to subcoriaceous, apex (sub)acuminate, base cuneate to rounded (to subcordate), margin entire or ± faintly and irregularly denticulate (or dentate) towards the apex; upper surface sparsely hairy on the main veins (or glabrous), smooth, lower surface ± sparsely brownish to whitish strigillose on the veins (or glabrous), smooth, cystoliths only beneath; lateral veins (5–)7–9 pairs, occasionally branched or furcate far from the margin, tertiary venation scalariform; waxy glands usually absent, present in occasional furcations of lateral veins (of relatively large leaves); petiole 0.5–2(–4) cm long, brown to whitish hirtellous to strigillose, the

Fig. 79. *Ficus benguetensis* Merr. a. Leafy twig with figs; b. fig-bearing branchlets (a: *Sulit 14351*; b: *Pancho 605*).

epidermis ± flaking off; stipules 0.8–2 cm long, glabrous or brown appressed-puberulous to strigillose, caducous (or subpersistent). *Figs* axillary, in pairs or solitary, often on minute spurs (also below the leaves, to cauliflorous?); peduncle 0.2–1.2 cm long; basal bracts 3, verticillate, 2–3(–5) mm long, ± deflexed; receptacle subglobose to ellipsoid to ovoid to obovoid, 1–2 cm diam. when dry, non-stipitate, ± sparsely puberulous (or glabrous), often with some rather conspicuous lenticels, without lateral bracts, reddish brown at maturity, apex ± convex, ostiole c. 2 mm diam., surrounded by 5 (often ± swollen) apical bracts; internal hairs sparse or absent. — **Fig. 79; Map 10.**

Distribution — Ryukyu Islands, Taiwan, and Malesia; in *Malesia*: Philippines (incl. Palawan).

Habitat — Lowland and montane forest, at altitudes up to 1800 m.



Map 10. Distribution of some species of subg. *Sycomorus* subsect. *Sycocarpus* with axillary figs: *F. benguetensis* Merr. (broken line); *F. calcarata* Corner (dotted line a); *F. carpenteriana* Elmer (dot-dash line); *F. decipiens* Reinw. ex Blume (dotted line b); *F. lepicarpa* Blume (continuous line); *F. multi-stipularis* Merr. (dotted line c).

Notes — 1. This species can be distinguished from the least hairy form of *F. congesta* by the absence of furcations of the lateral veins, the absence of waxy glandular spots on the lamina beneath, and the tendency to form minute spurs in the leaf axils. It is distinct from the more hairy form of *F. congesta* in the smooth lamina with a flat margin.

2. It can be distinguished from *F. carpenteriana* by the exfoliating periderm of the leaf twigs and epidermis of the petiole as well as by the normally caducous stipules.

3. In Taiwan, the axillary spurs often become up to 2 cm long.

36. Ficus bernaysii King

Ficus bernaysii King, J. Asiat. Soc. Bengal, Pt. 2, 4 (1886) 406; Sp. Ficus 2 (1889) 7, t. 230B; K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 279; Summerh., J. Arnold Arbor. 10 (1929) 148; Diels, Bot. Jahrb. Syst. 67 (1935) 213; Summerh., J. Arnold Arbor. 22 (1941) 99; Corner, Gard. Bull. Singapore 21 (1965) 87.

Tree up to 15 m tall. *Leafy twigs* 2.5–5 mm thick, (dark) brown hirtellous to subhirsute, the longer stiff hairs intermixed with shorter and softer white hairs, with nodal waxy glands; internodes hollow; periderm (of the older parts) flaking off. *Leaves* (sub)distichous (or subopposite); lamina oblong to subobovate, (2–)7–28 by (1–)3.5–12 cm, asymmetric, chartaceous, apex acuminate, base rounded to subcordate at the broad side, cuneate to rounded at the narrow side, margin denticulate to dentate; upper surface hirtellous to hispidulous, ± scabrous, lower surface brown hirtellous to subhirsute on the veins, the longer stiff hairs intermixed with shorter and softer white hairs, smooth, cystoliths only beneath; lateral veins (4–)8–13 pairs, often furcate far from the margin, 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; petiole 0.5–2

cm long, brown hirtellous to subhirsute, the longer stiff hairs intermixed with shorter and softer white hairs, the epidermis persistent; stipules 0.5–2 cm long, white to brown appressed-puberulous to subsericeous, caducous (or subpersistent). *Figs* cauliflorous on up to c. 20 cm long branched branchlets, on the (base of the) trunk, the lateral fig-bearing branchlets often slender, with small (0.1–0.2 cm long) persistent stipules; peduncle 3–8 cm long, slender; basal bracts 3, verticillate, 1.5–2 mm long; receptacle subglobose to ovoid or to depressed-globose, 0.8–1.2 cm diam. when dry, c. 2.5 cm diam. when fresh, non-stipitate or with stipes 0.1–0.6 mm long, (sub)glabrous, lenticellate, without lateral bracts, red, dark red to blackish or purple-brown at maturity, apex convex, ostiole c. 3 mm diam., prominent; internal hairs abundant, brown.

Distribution — Malesia and the Solomon Islands; in *Malesia*: New Guinea.

Habitat — Forest and secondary growth, often along streams, at altitudes up to 1500(–1800) m.

37. Ficus biakensis C.C. Berg

Ficus biakensis C.C. Berg, Blumea 49 (2004) 168.

Shrub up to 5 m tall, sparingly branched. *Leafy twigs* 5–9 mm thick, (sub)glabrous, with nodal glands; internodes hollow; periderm flaking off. *Leaves* spirally arranged, ± tufted; lamina elliptic, 10–25 by 4.5–13 cm, (almost) symmetric, chartaceous to subcoriaceous, apex acuminate, base (sub)cordate, margin (sub)entire; upper surface very sparsely brownish strigillose, glabrescent, smooth, lower surface brown strigose to strigillose on the main veins, smooth, cystoliths only beneath; lateral veins 5–10 pairs, some of them furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of some of the lateral veins in the middle part of the lamina or also small one in furcations of lateral veins or absent; petiole 0.3–1 cm long, glabrous, the epidermis flaking off; stipules 1–3 cm long, glabrous, (sub)persistent. *Figs* axillary, clustered on up to 0.5 cm long spurs, ± concealed by the stipules, subsessile or with a peduncle up to 0.8 cm long; basal bracts 3, subverticillate, 1.5–2.5 mm long; receptacle subglobose, 1.6–1.8 cm diam. when dry, glabrous, without lateral bracts, colour at maturity unknown, apex ± convex, ostiole c. 4 mm diam., including 5 erect apical bracts; internal hairs sparse.

Distribution — *Malesia*: New Guinea (Bird's Head Peninsula).

Habitat — Young secondary forest on strongly humified limestone silt, at low altitudes.

Note — The absence of indumentum on various parts suggests that this species is related to *F. septica*. It is clearly distinct in the very short petiole, the narrowly cordate base of the lamina, and the subpersistent stipules. In its habit, as in the size of the plant and the ± tufted leaves, it resembles the group of species related to *F. calcarata*.

38. Ficus boanensis C.C. Berg

Ficus boanensis C.C. Berg, Blumea 49 (2004) 168.

Treelet c. 5 m tall. *Leafy twigs* 1–3 mm thick, sparsely whitish strigillose, without nodal waxy glands; internodes solid with ample pith; periderm flaking off. *Leaves* sub-

distichous or subopposite; lamina oblong, (3–)7–18 by (1.2–)3–7 cm, ± asymmetric, chartaceous, apex acuminate, base cuneate to rounded, margin subentire; upper surface sparsely white strigillose or glabrous, smooth, lower surface sparsely whitish strigillose or glabrous, smooth, drying greenish, upper surface brown, cystoliths only beneath; lateral veins (4–)7–10 pairs, unbranched or in large leaves one or some furcate far from the margin, tertiary venation (sub)scalariform; waxy glands in the axils of two or more lateral veins in the middle to upper part of the lamina; petiole 0.5–2.5 cm long, sparsely whitish strigillose, the epidermis flaking off; stipules 0.5–1.5 cm long, sparsely (dark) brown strigillose at the base, subpersistent, reflexed. *Figs* axillary, solitary; peduncle 0.3–0.5 cm long; basal bracts 3, verticillate, 1–1.5 mm long; receptacle subglobose to depressed-globose or to ovoid, 1–1.3 cm diam. when dry, up to 0.8 cm long stipitate, glabrous, without lateral bracts, colour at maturity unknown, faintly ribbed, apex concave to flat, ostiole 2–2.5 mm diam.; internal hairs absent.

Distribution — *Malesia*: New Guinea (Morobe and Southern Highland Provinces).

Habitat — Forest, at altitudes between c. 300 and 800 m.

Note — This species might be related to *F. hispida*, from which it can be distinguished by the reflexed subpersistent stipules, the glabrous upper surface of the lamina, the short petiole, and the absence of cauliflory.

39. Ficus botryocarpa Miq.

Ficus botryocarpa Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 233, 296; King, Sp. Ficus 2 (1888) 107, t. 138; Koord., Minah. (1898) 597; Corner, Gard. Bull. Singapore 21 (1965) 86.

Tree up to 14 m tall. *Leafy twigs* 2–4 mm thick, brown strigose to hirtellous, the longer stiff hairs intermixed with shorter and softer white hairs, or with hairs of about equal length and whitish appressed-puberulous to strigillose or to whitish (to brownish) hirtellous, often with nodal glands; internodes hollow or solid; periderm persistent. *Leaves* (sub)distichous or (sub)opposite; lamina oblong to subobovate to elliptic or oblanceolate, 8–20(–26) by 3–7(–12) cm, ± asymmetric, chartaceous, drying greyish or brown, apex acuminate to subacute, base cuneate to obtuse (to rounded), margin (sub)entire or towards the apex denticulate; upper surface rather densely to very sparsely whitish strigillose to subhispidulous or (sub)glabrous, ± scabrous or smooth, lower surface brownish strigose to hirtellous on the main veins, the longer stiff hairs intermixed with shorter and softer white hairs, white, appressed- to patent-puberulous on the smaller veins or the hairs of about equal length and whitish appressed-puberulous to strigillose on the veins or whitish to brownish hirtellous to puberulous on the veins, smooth or scabridulous, cystoliths above and beneath; lateral veins (4–)6–10 pairs, none or some of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of 1 or 2 lateral veins in the middle part of the lamina, or also small ones in the axils of the basal lateral veins, or the glands absent; petiole 0.4–2(–2.5) cm long, brown to whitish hirtellous or whitish appressed-puberulous to strigillose, the epidermis persistent; stipules (0.6–)1–2.5(–2.8) cm long, brown hirtellous or partly white appressed-puberulous or entirely whitish to yellowish to brownish appressed-puberulous to subsericeous, caducous (or subpersistent). *Figs* cauliflorous on up to 1 m long branched branchlets with caducous or subpersistent

stipules, on the older wood; peduncle 0.4–2.5 cm long; basal bracts 3, verticillate (or scattered), 1–2.5 mm long; receptacle subglobose to obovoid to subpyriform to depressed-globose, 1–2.5 cm diam. when dry, 2–4 cm diam. when fresh, non-stipitate or sometimes up to 0.4 cm long stipitate, brownish to whitish puberulous to hirtellous, without lateral bracts, faintly (6–20-)ribbed, greenish or whitish (with yellowish spots) at maturity, apex flat to concave or to slightly convex, ostiole (2.5–)3–6 mm diam., flat or ± prominent; internal hairs abundant, brownish or whitish, longer than the flowers.

Note — Three rather distinct subspecific entities can be recognized.

KEY TO THE SUBSPECIES

1a. Hairs on the leafy twigs and the lamina beneath whitish; fig receptacle 1–1.5(–2.2) cm diam. when dry, ostiole 3–4(–5) mm diam. — Philippines, Celebes, Moluccas . . . . . **c.** subsp. **subalbidoramea**

b. Hairs on the leafy twigs and the lamina beneath whitish brown(ish) or partly whitish; fig receptacle 1.2–2.5 cm diam. when dry 2

2a. Hairs on the leafy twigs brown, intermixed with shorter white hairs; fig ostiole c. 3 mm diam. — Philippines, Celebes, Moluccas . . . . . **a.** subsp. **botryocarpa**

b. Hairs on the leafy twigs whitish (or brownish); fig ostiole 3–6 mm diam. — New Guinea . . . . . **b.** subsp. **hirtella**

a. subsp. **botryocarpa**

Ficus caulocarpa Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 235, 297.

Ficus miquelii King, J. Asiat. Soc. Bengal, Pt. 2, 4 (1886) 405; Sp. Ficus 2 (1888) 106, quoad typus Celebes.

Ficus barnesii Merr., Publ. Gov. Lab. Philipp. 17 (1904) 12; Philipp. J. Sci., 1, Suppl. (1906) 46; Elmer, Leafl. Philipp. Bot. 1 (1906) 58, 198; 7 (1912) 2391; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 46; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 309.

Ficus endothrix Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 200.

Ficus sordidissima Elmer, Leafl. Philipp. Bot. 4 (1911) 1268; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 65; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 310.

Ficus sorsogonensis Elmer, Leafl. Philipp. Bot. 9 (1937) 3439; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 310.

Leafy twigs brown strigose to hirtellous, the longer stiff hairs intermixed with shorter and softer white hairs. *Lamina* drying brown (or greyish); upper surface rather densely to very sparsely whitish strigillose to subhispidulous, ± scabrous to smooth, lower surface brownish strigose to hirtellous on the main veins, the longer stiff hairs intermixed with shorter and softer white hairs, white appressed- to patent-puberulous on the smaller veins, smooth or scabridulous; lateral veins (4–)6–8 pairs, some or none branched or furcate far from the margin; waxy glands in slit-shaped extensions of the axils of 1 or 2 lateral veins in the middle part of the lamina or also in the axils of the basal lateral veins; petiole 0.4–1(–1.2) cm long, brown to whitish hirtellous (to substrigillose); stipules 1.2–2.5(–2.8) cm long, brown hirtellous or partly white appressed-puberulous. *Fig peduncle* 0.3–1.2(–1.7) cm long; basal bracts 3, verticillate, 2–2.5 mm long; receptacle subglobose to depressed-globose, 1.2–2.5 cm when dry, 2–4 cm diam. when fresh, non-

stipitate or sometimes up to 0.2 cm long stipitate, brownish puberulous to hirtellous, faintly (6–15-)ribbed, with or without conspicuous lenticels, ostiole c. 3 mm diam., flat.

Distribution — *Malesia*: Philippines (Luzon, Mindoro, Samar, Leyte, Siargao, Mindanao), Celebes (Sangi and Talaud Islands, Minahassa), Moluccas (Ceram, Ternate).

Habitat — Forest, at low altitudes.

Note — This variety is rather variable. Most specimens from Celebes and the Moluccas are morphologically closer to the other varieties than to most of those from the Philippines and the Sangi and Talaud Islands.

b. subsp. **hirtella** (King) C.C. Berg

Ficus botryocarpa Miq. subsp. *hirtella* (King) C.C. Berg, Blumea 49 (2004) 171.
Ficus conora King, Sp. Ficus 2 (1888) 103, t. 131.
Ficus botryocarpa Miq. var. *subalbidoramea* (Elmer) Corner forma *scabrida* Corner, Gard. Bull. Singapore 18 (1960) 44.

Leafy twigs whitish (to brownish) partly puberulous to hirtellous, partly with appressed hairs, hairs of different length. *Lamina* drying greyish; upper surface (sub)-glabrous, smooth, lower surface whitish to brownish hirtellous to puberulous on the veins, often with ± retrorse hairs, smooth; lateral veins (4–)6–10 pairs, none of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of 1 or 2 lateral veins in the middle part of the lamina; petiole 0.4–1.5 cm long, whitish hirtellous; stipules 0.6–1.6 cm long, whitish to yellowish to brownish appressed-puberulous to subsericeous, caducous. *Fig peduncle* 0.8–1.8 cm long; basal bracts 3, verticillate (or scattered), 1–2.5 mm long; receptacle depressed-globose, (1–)1.5–2 cm diam. when dry, c. 2.5 cm diam. when fresh, non-stipitate or sometimes up to 0.3 cm long stipitate, sparsely whitish puberulous, without lateral bracts, finely, 15(–20-)ribbed, with conspicuous lenticels, ostiole 5–6 mm diam., ± prominent.

Distribution — *Malesia*: New Guinea (incl. New Britain).

Habitat — Forest, at altitudes up to 1000 m.

Note — This variety is quite uniform.

c. subsp. **subalbidoramea** (Elmer) C.C. Berg

Ficus botryocarpa Miq. subsp. *subalbidoramea* (Elmer) C.C. Berg, Blumea 49 (2004) 172. — *Ficus subalbidoramea* Elmer, Leafl. Philipp. Bot. 7 (1914) 2389; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 309. — *Ficus botryocarpa* Miq. var. *albidoramea* (Elmer) Corner, Gard. Bull. Singapore 18 (1960) 44.
Ficus mindorensis Merr., Publ. Gov. Lab. Philipp. 17 (1904) 12; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 225, f. 24; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 58; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 308.
Ficus trichantha Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 201.
Ficus conora auct. non King: Elmer, Leafl. Philipp. Bot. 4 (1912) 1376; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 50; Diels, Bot. Jahrb. Syst. 67 (1935) 218; Summerh., J. Arnold Arbor. 22 (1941) 101; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 267, 308.

Leafy twigs whitish appressed-puberulous to strigillose, with hairs of different length. *Lamina* drying greyish; upper surface appressed-puberulous to strigillose to (sub)glabrous, smooth, lower surface whitish appressed-puberulous to strigillose on the veins, smooth; lateral veins (3–)6–10 pairs, none of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of 1 or 2 lateral veins in the middle part of the lamina; petiole 0.5–2(–2.5) cm long, whitish appressed-puberulous to strigillose; stipules 0.6–2 cm long, whitish to yellowish to brownish appressed-puberulous to subsericeous, caducous (or subpersistent). *Fig peduncle* 0.4–2.5 cm long; basal bracts 3, verticillate (or scattered), 1–2 mm long; receptacle obovoid to subpyriform to subglobose or ± depressed-globose, 1–1.5(–2.2) cm diam. when dry, c. 2.5 cm diam. when fresh, finely, 15(–20-)ribbed, with or without conspicuous lenticels, ostiole 3–4(–5) mm diam., ± prominent.

Distribution — *Malesia*: Philippines (Luzon, Mindoro, Palawan, Luzon, Mindanao), Celebes, Moluccas (Ternate? and Ambon).

Habitat — Forest, at low altitudes.

Note — The material from Celebes and the Moluccas differs somewhat from that from the Philippines in the relatively large (c. 2 cm diam. when dry) and ± depressed-globose fig receptacle tending to have a wider ostiole and to be more conspicuously lenticellate, thus in fig characters approaching var. *conora* (from New Guinea).

40. Ficus calcarata Corner

Ficus calcarata Corner, Gard. Bull. Singapore 18 (1960) 55.
Ficus pungens auct. non Reinw. ex Blume: King, Sp. Ficus 2 (1888) 107, t. 139.

Tree up to 6(–10) m tall. *Leafy twigs* 5–7 mm thick, (dark) brown (sub)hirsute or whitish strigose, without nodal waxy glands; internodes hollow; periderm persistent. *Leaves* spirally arranged, ± tufted; lamina elliptic to obovate (or oblong to subobovate), (9–)12–30 by (1–)5–18 cm, (almost) symmetric, chartaceous, apex acuminate, base truncate to subcordate or to subcuneate, margin denticulate; upper surface strigose to hispid(ulous), ± scabrous, lower surface brown hirsute or whitish strigose to subhispidulous on the veins, ± scabrous, cystoliths only beneath; lateral veins 7–10 pairs, often branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of the basal pair and some other lateral veins and in furcations of lateral veins; petiole 1–3 cm long, brown hirsute or white strigose, the epidermis persistent; stipules 1.5–3 cm long, partly brown (sub)hirsute or whitish strigose, (sub)persistent. *Figs* axillary, in pairs or solitary, sessile; basal bracts 3, verticillate, 4–10 mm long; receptacle subglobose, 1.5–2.2 cm diam. when dry, (dark) brown (sub)hirsute, usually with a few lateral bracts, yellow (or red?) at maturity, apex flat, ostiole c. 4 mm diam., slightly prominent; internal hairs sparse and white or brownish, or absent. — **Map 10.**

Distribution — *Malesia*: Moluccas (Morotai, Halmahera, Ternate), Celebes (?).

Habitat — Forest and secondary growth, at low altitudes; locally common.

Notes — 1. *Pleyte 286* from Halmahera differs somewhat from the other collections by the relatively small and narrow laminas.

2. A sterile collection from C Celebes (Malili) probably represents this species.

41. **Ficus calopilina** Diels

Ficus calopilina Diels, Bot. Jahrb. Syst. 67 (1935) 212; Gard. Bull. Singapore 21 (1965) 87.
Ficus setistyla Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 284, non Warb. in Feddes Repert. Spec. Nov. Regni Veg. 1 (20 Sept. 1905) 77; Summerh., J. Arnold Arbor. 10 (1929) 149.
Ficus hispidioides S. Moore var. *flavescens* Corner, Gard. Bull. Singapore 18 (1961) 96.
Ficus hispidioides S. Moore var. *succosa* Corner, Gard. Bull. Singapore 18 (1961) 96.
Ficus grandis auct. non King: Diels, Bot. Jahrb. Syst. 67 (1935) 214, p.p.; Summerh., J. Arnold Arbor. 22 (1941) 99; Corner, Gard. Bull. Singapore 21 (1965) 87.

Tree up to 15 m tall. *Leafy twigs* 2–8 mm thick, white hirtellous (to puberulous), with nodal waxy glands, hollow; periderm sooner or later flaking off, often starting below the leaves. *Leaves* spirally arranged to subopposite or on ultimate twigs distichous; lamina (broadly) elliptic to obovate, (7–)12–26(–35) by (4.5–)7–15(–21) cm, ± asymmetric to almost symmetric, chartaceous, apex shortly acuminate (to rounded), base cordate to obtuse, margin denticulate (to subentire); upper surface hirtellous to hispidulous, ± scabrous, lower surface whitish to brownish hirtellous on the veins, smooth, cystoliths above and beneath; lateral veins 6–10(–12) pairs, often furcate far from the margin, tertiary venation scalariform, ± prominent; waxy glands in the axils of lateral veins and in furcations of lateral veins; petiole (0.5–)2–6(–11) cm long, hirtellous, the epidermis sooner or later flaking off; stipules 1–3 cm long, white to brown hirtellous to subsericeous, caducous. *Figs* cauliflorous (or axillary) mostly in clusters on stout up to 30 cm long branchlets, on the trunk and the main branches; peduncle 0.5–2(–3) cm long (or subsessile); basal bracts 3, (sub)verticillate or ± scattered, 2–6 mm long, stiff, often lanceolate; receptacle subglobose to pyriform to obovoid, (1.5–)2–4 cm diam. when dry, 3–6 cm diam. when fresh, sometimes shortly stipitate, sparsely to densely whitish to brownish puberulous, without lateral bracts, orange to reddish or brownish at maturity, apex ± concave to convex, ostiole 4–6 mm diam., surrounded by 5 or 6 or a rosette of erect apical bracts; internal hairs sparse to abundant, white to brownish.

Distribution — *Malesia*: New Guinea (incl. New Britain).

Habitat — Forest and secondary growth, often along streams; at altitudes up to 2400 m.

Notes — 1. The species is rather variable. It might include *F. papuana* (see p. 440). The differentiating characters between *F. calopilina* and *F. pachyrrhachis* are also rather weak. The species is not only morphologically quite variable, but also occupies a wide altitudinal range.

2. The syconia are edible.

42. **Ficus carpenteriana** Elmer

Ficus carpenteriana Elmer, Leafl. Philipp. Bot. 1 (1906) 197; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 47; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 269; Corner, Gard. Bull. Singapore 21 (1965) 89.
Ficus weberi Merr., Philipp. J. Sci., Bot. 9 (1914) 274. — *Ficus wenzelii* Merr. var. *weberi* (Merr.) Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 270.
Ficus castanea Elmer, Leafl. Philipp. Bot. 9 (1937) 3441; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 270.

Shrub or tree up to 5(–8) m tall. *Leafy twigs* 2.5–5 mm thick, ± densely brown hirtellous to subhirsute to white pilose, usually with nodal waxy glands; internodes hollow or solid; periderm persistent. *Leaves* spirally arranged, (sub)opposite or (sub)distichous; lamina oblong to subobovate to subovate to elliptic, (5–)10–20(–33) by (2–)5–8(–14) cm, mostly ± asymmetric, chartaceous to subcoriaceous, apex (sub)acuminate, base rounded to subcordate or to cuneate, margin entire or ± faintly and irregularly denticulate to subcrenate (towards the apex); upper surface sparsely pilose on the main veins, smooth, lower surface brown to whitish hirtellous to pilose on the veins, smooth, cystoliths only beneath; lateral veins (5–)6–11(–13) pairs, occasionally branched or furcate far from the margin, tertiary venation reticulate; waxy glands small, in the axils of lateral veins in the middle part of the lamina or absent; petiole 1–3.5 cm long, brown to whitish hirtellous to pilose, the epidermis persistent; stipules (1–)1.5–4 cm long, brown to whitish substrigose to pilose or glabrous, (sub)persistent. *Figs* axillary, in pairs or solitary, occasionally cauliflorous on up to 7 cm long branched branchlets with short internodes; sessile or with a peduncle up to 0.7 cm long; basal bracts 3, verticillate, 1.5–3 mm long; receptacle subglobose to ellipsoid to obovoid, 1–1.8 cm diam. when dry, brown pilose, without lateral bracts, reddish (or purple?) at maturity, apex ± convex, ostiole c. 2.5 mm diam., surrounded by 5 ± swollen apical bracts; internal bristles sparse or absent. — **Map 10.**

Distribution — *Malesia*: Philippines (Samar, Leyte, Mindanao).

Habitat — Forest, at altitudes up to c. 1700 m

Note — The syconia are eaten by civet cats.

43. Ficus cassidyana Elmer

Ficus cassidyana Elmer, Leafl. Philipp. Bot. 1 (1906) 200; 4 (1911) 1265; 7 (1914) 2393; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 48; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 318; Corner, Gard. Bull. Singapore 21 (1965) 86.

Ficus casiguranensis Quisumb. & Merr., Philipp J. Sci. 37 (1928) 141; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 306; Corner, Gard. Bull. Singapore 21 (1965) 86. — *Ficus cassidyana* Elmer var. *casiguranensis* (Quisumb. & Merr.) Corner, Gard. Bull. Singapore 21 (1965) 86.

Tree up to 6 m tall. *Leafy twigs* 4–6 cm thick, brown setose-hirtellous to hirsute, the longer hairs intermixed with shorter and softer white hairs, with nodal glands; internodes solid with ample pith or hollow; periderm flaking off below the leaves. *Leaves* spirally arranged; lamina elliptic to obovate to subcordiform or to subpandurate, (11–)16–36 by (6–)9–22 cm, symmetric, chartaceous, apex acuminate, base (sub)cordate, margin denticulate; upper surface (sub)hispidulous, scabrous, lower surface brown hirtellous to subhirsute on the veins, the longer hairs intermixed with shorter and softer white hairs, smooth, cystoliths above and beneath; lateral veins 6–9 pairs, most of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of the basal and other lateral veins and often smaller ones in furcations of lateral veins; petiole 2–8(–11) cm long, brown setose-hirtellous to subhirsute, the longer hairs intermixed with shorter and softer white hairs, the epidermis persistent; stipules 1.5–2.5 cm long, whitish subsericeous and brown setose-strigose, caducous. *Figs* cauliflorous on stout unbranched up to 14 cm long branchlets with prominent scars of the fig pedun-

cles; peduncle 1.2–1.7 cm long; basal bracts 3, verticillate, 3–4 mm long; receptacle depressed-globose to pyriform, 3.5–5 cm diam. when dry, brown hispidulous, without lateral bracts, with numerous weak ribs, colour at maturity unknown, apex concave, ostiole 5–8 mm diam., umbonate; internal hairs abundant, white to brownish.

Distribution — *Malesia*: Philippines.

Habitat — Forest and secondary growth, at altitudes up to 1000 m.

44. **Ficus cereicarpa** Corner

Ficus cereicarpa Corner, Gard. Bull. Singapore 18 (1960) 57; 21 (1965) 91.
Ficus cereicarpa Corner var. *ashtonii* Kochummen, Gard. Bull. Singapore 50 (1998) 213.

Tree up to 9 m tall. *Leafy twigs* 4–9 mm thick, whitish to brown villous to subhirsute or to substrigose, with nodal glands; internodes hollow; periderm persistent; scars of leaves conspicuous. *Leaves* spirally arranged; lamina subobovate to subpandurate to oblong to elliptic to subovate, 13–30(–50) by 6.5–13(–30) cm, (almost) symmetric, chartaceous to subcoriaceous, apex (sub)acuminate, base (sub)cordate, margin entire or denticulate towards the apex; upper surface (sparsely) whitish to brown villous on the midrib, for the rest (or entirely) subglabrous, glabrescent, smooth, lower surface whitish hirsute to hirtellous on the veins, smooth, cystoliths only beneath; lateral veins 8–18 pairs, some or most of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins (sometimes on the midrib) and in the furcations of lateral veins; petiole (2–)5–18 cm long, white to brown villous, glabrescent, the epidermis persistent; stipules (1.5–)2.5–5 cm long, whitish to brown villous to subsericeous to subhirsute, caducous or subpersistent. *Figs* cauliflorous clustered on unbranched or branched lateral branches (with short internodes and up to 1 cm long subpersistent stipules) of stout up to 30 cm long branchlets, on the base of the trunk (and ending in the soil); peduncle 0.5–1(–4) cm long; basal bracts ± scattered or 3 and verticillate, (3–)5–12 mm long; receptacle pyriform to obovoid to subglobose, 2–5 cm diam. when dry, 3–8 cm diam. when fresh, villous to glabrous or glabrescent, with some or numerous up to 1.5 cm long curved lateral bracts scattered or (if some, then often) in a whorl at the apex of the receptacle (or without lateral bracts), often faintly ribbed, orange at maturity, apex flat to ± concave, ostiole (5–)8–12 mm diam. (including the rosette of bracts around the orifice); internal hairs abundant; wall thick. — **Fig. 80.**

Distribution — *Malesia*: Borneo (northern).

Habitat — Lowland and montane forest, often on rocks or cliffs along rivers, at altitudes up to 1600 m.

Notes — 1. This species is quite variable in shape and dimensions of the fig receptacle, length of the peduncle, and presence of lateral bracts.

2. *Chin 2843* (Sabah) is distinct from the others in the up to 4 cm long fig peduncle with a narrow fig receptacle (up to 1.5 cm diam.) without lateral bracts and small (c. 3 mm long) basal bracts.

3. The figs are edible, also when green.

Fig. 80. *Ficus cereicarpa* Corner. a. Leafy twig; b. fig-bearing branchlet; c. fig; d. long-styled flowers; e. fruits (a: *Clemens 29585*; b–e: *SF 266131*).

45. **Ficus congesta** Roxb.

Ficus congesta Roxb., Fl. Ind., ed. Carey 3 (1832) 560; Wight, Ic. 2 (1843) t. 644; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; King, Sp. Ficus 2 (1888) 180; Corner, Gard. Bull. Singapore 18 (1960) 51; 21 (1965) 88. — *Covellia congesta* (Roxb.) Miq., London J. Bot. 7 (1848) 463; Fl. Ind. Bat. 1, 2 (1859) 324, t. 23B.

Ficus menadana Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 233, 296; King, Sp. Ficus 2 (1888) 182. — *Ficus congesta* Roxb. var. *menadana* (Miq.) Corner, Gard. Bull. Singapore 18 (1960) 52; 21 (1965) 88.
Ficus fasciculata F. Muell. ex Benth., Fl. Austral. 6 (1873) 177, incl. var. *opposita* Benth.; F.M. Bailey, Queensl. Fl. 5 (1902) 1478; Compr. Cat. Qld. Pl. (1913) 504; Domin, Bibl. Bot. 89 (1921) 570.
Ficus chalmersii King, J. Asiat. Soc. Bengal, Pt. 2, 4 (1886) 406; Sp. Ficus 2 (1888) 6, t. 230A; Summerh., J. Arnold Arbor. 10 (1929) 148; Diels, Bot. Jahrb. Syst. 67 (1935) 215. — *Ficus congesta* Roxb. var. *chalmersii* (King) Corner, Gard. Bull. Singapore 18 (1960) 52; 21 (1965) 88.
Ficus caulothyrsa Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 286.
Ficus trichostyla Warb., Feddes Repert. Spec. Nov. Regni Veg. 1 (1905) 77.
Ficus serraria auct. non Miq.: Koord., Minah. (1898) 597.
Ficus fistulosa auct. non Reinw. ex Blume: Koord., Minah. (1898) 599.
Ficus glomerata auct. non Roxb.: Hiern, J. Bot. 39 (1901) 4.

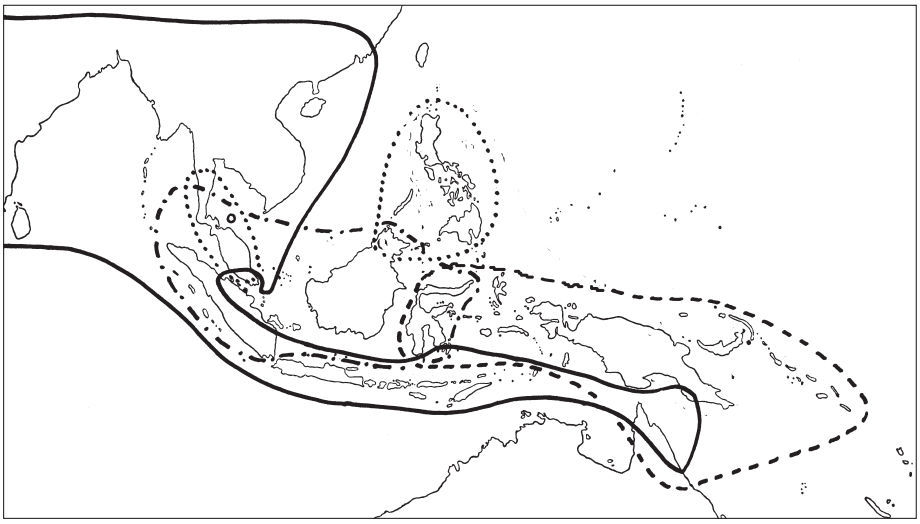
Tree up to 25 m tall. *Leafy twigs* 1.5–3.5 mm thick, densely to rather sparsely brown to whitish appressed- (to patent-)puberulous to strigillose, with (small) nodal waxy glands; internodes hollow; periderm flaking off (often starting below the leaves). *Leaves* spirally arranged, subdistichous or (sub)opposite; lamina oblong to elliptic to subobovate, (4–)10–20(–26) by (1.5–)4–9(–14) cm, usually slightly asymmetric, chartaceous to subcoriaceous, apex acuminate, base obtuse to cuneate or to rounded (to subcordate), margin ± irregularly crenate-dentate to -denticulate (towards the apex) or (sub)entire, ± revolute or flat; upper surface sparsely white appressed-puberulous, smooth, lower surface sparsely whitish appressed- (to patent-)puberulous to strigillose on the (main) veins, scabridulous or smooth, cystoliths only beneath; lateral veins (4–)7–9(–10) pairs, none or some of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands small, sometimes present in the axils of some of the lateral veins in the middle part of the lamina, often absent; petiole 1–2(–2.5) cm long, densely (to rather sparsely) whitish appressed- (to patent-)puberulous to strigillose, the epidermis flaking off; stipules 0.5–1 cm long, sparsely to densely brownish to whitish strigillose, caducous. *Figs* cauliflorous on up to 50 cm long branched branchlets on the older wood; peduncle 0.5–2.5 cm long; basal bracts 3, (usually) verticillate, 1.5–2.5 mm long; receptacle subglobose to pyriform to depressed-globose, 1.3–3 cm diam. when dry, 2–4 cm diam. when fresh, non-stipitate or up to 0.2(–0.6) cm long stipitate, (sub)glabrous, without lateral bracts, often finely ribbed, reddish at maturity, red-brown or brownish yellow, apex convex to flat to deeply concave, ostiole 3–6 mm diam.; internal hairs absent. — **Map 11.**

Distribution — *Malesia*: Celebes, Moluccas (Buru, Ceram, Ambon, Tanimbar Islands), New Guinea (incl. New Britain).

Habitat — Forest, often near streams, mostly at low altitudes, in New Guinea up to c. 2300 m.

Notes — 1. Two forms can be recognized:

1) Plant parts (rather) sparsely hairy with white appressed hairs; lamina smooth beneath; lateral veins often furcate (even in relatively small leaves); leaf margin flat; material included in var. *congesta*.
2) Plant parts more densely hairy, with whitish or brownish appressed or patent hairs; lamina often scabridulous beneath; lateral veins (even in relatively large leaves) rarely furcate; leaf margin often ± revolute (when dry); material included in var. *chalmersii* (New Guinea) and var. *menadana* (Celebes).



Map 11. Distribution of some species of subg. *Sycomorus* subsect. *Sycocarpus*: *F. congesta* Roxb. (broken line); *F. hispida* L.f. (continuous line); *F. nota* (Blanco) Merr. (dotted line, eastern); *F. obpyramidata* King (dotted line, western); *F. schwarzii* Koord. (dot-dash line).

2. The sparsely hairy form 1) is relatively rare in New Guinea. Without figs, this form cannot be distinguished from (the allopatric?) *F. fistulosa*. Material with figs can usually be distinguished by the (mostly) larger figs borne on elongate, rather slender leafless branchlets. The link between the sparsely hairy material and *F. fistulosa* is so strong that one may wonder whether the two morphological forms should be kept in a single species or the sparsely hairy entity should be included in *F. fistulosa* as a subspecies.

3. The fig receptacle tend to increase in size from West to East.

4. The material from Australia (referred to this species) is ± aberrant in the indumentum, the regular presence of axillary figs, and the epidermis of the petiole flaking off in large flakes. It may represent a distinct taxon, at least at the subspecific level. Names based on Australian material, *F. setistyla* Warb. (1905) = *F. chaetostyla* Diels (1935), are not included as synonyms in the current treatment.

46. Ficus cryptosyce Corner

Ficus cryptosyce Corner, Blumea 18 (1970) 409, t. 11.

Shrub, c. 1.5 m tall, sparingly branched. *Leafy twigs* 5–8 mm thick, dark brown strigose, without (?) nodal glands; internodes hollow; periderm flaking off below the leaves. *Leaves* spirally arranged, ± tufted; lamina subobovate to oblanceolate, 6–23 by 3–8 cm, (almost) symmetric, chartaceous to subcoriaceous, apex shortly acuminate, base (sub)cordate, margin (sub)entire; upper surface sparsely strigillose, glabrescent, smooth, lower surface brown strigillose to appressed-puberulous on the main veins, smooth, cystoliths only beneath; lateral veins 5–10 pairs, some or none of them furcate far from the margin, tertiary venation loosely scalariform; waxy glands in the axils of

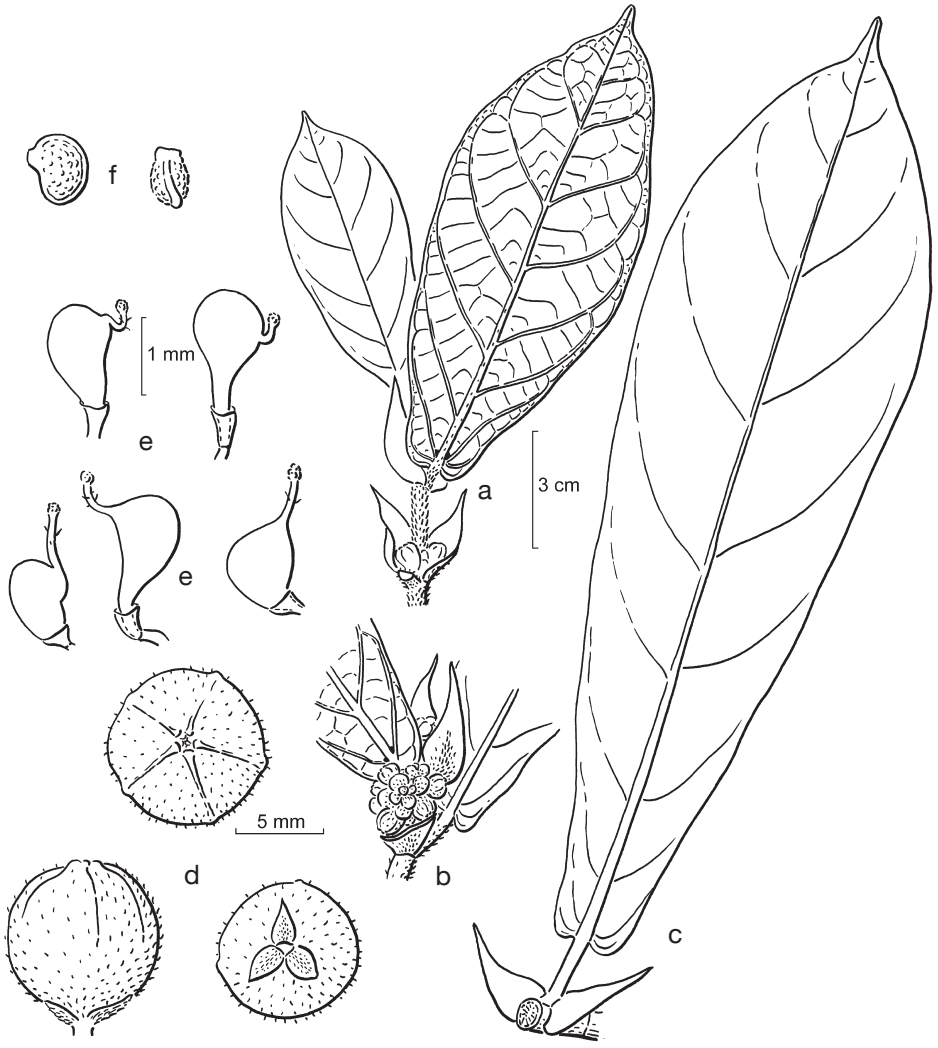


Fig. 81. *Ficus cryptosyce* Corner. a, b. Leafy twig with figs; c. leaf and stipules; d. figs; e. long-styled flowers; f. fruits (all: *BW 15392*). From Blumea 18 (1970) 410.

(one of) the basal lateral veins or small ones also in furcations of lateral veins; petiole 0.4–1.8 cm long, brown strigillose, the epidermis persistent; stipules 1.5–3.5 cm long, brown strigillose, (sub)persistent. *Figs* axillary, clustered on up to 0.5 cm long spurs, ± concealed by the stipules, subsessile or with a peduncle up to 0.2 cm long; basal bracts 3, subverticillate, 1.5–2.5 mm long; receptacle subglobose to obovoid, 0.7–0.9 cm diam. when dry, brown strigillose, without lateral bracts, slightly ribbed, colour at maturity unknown, apex ± convex, ostiole c. 3 mm diam., including 5 thickened apical bracts, umbonate; internal hairs absent. — **Fig. 81.**

Distribution — *Malesia*: New Guinea (Bird's Head Peninsula).

Habitat — In young secondary forest on strongly humified limestone silt, at low altitudes.

Note — The species shows in its vegetative characters striking similarities to *F. multistipularis*. It is quite distinct in the way the figs are borne.

47. Ficus cuneata (Miq.) Miq.

Ficus cuneata (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 297, non Blume 1825; King, Sp. Ficus 2 (1888) 110, t. 145A; Renner, Bot. Jahrb. Syst. 39 (1907) 398. — *Covellia cuneata* Miq., London J. Bot. 7 (1848) 466, t. 8B; Fl. Ind. Bat. 1, 2 (1859) 326. — *Ficus ribes* Reinw. ex Blume var. *cuneata* (Miq.) Corner, Gard. Bull. Singapore 18 (1960) 44; 21 (1965) 85.

Covellia microcarpa Miq., London J. Bot. 7 (1848) 466, t. 9A; Pl. Jungh. (1851) 66, non *F. microcarpa* L.f. 1782.

Ficus ribes Reinw. ex Blume var. *cuneata* (Miq.) Corner forma *stenophylla* Corner, Gard. Bull. Singapore 18 (1960) 44.

Tree up to 10 m tall. *Leafy twigs* 1.5–3 mm thick, whitish appressed-puberulous to strigillose, without nodal waxy glands; internodes hollow or solid; periderm (usually) persistent. *Leaves* (sub)distichous, sometimes subopposite; lamina oblong to subobovate to (ob)lanceolate to (sublinear), (1.5–)4–14 by (0.5–)1–4.5 cm, slightly to distinctly asymmetric, chartaceous, apex (sub)acuminate to subacute, base cuneate, margin (sub)entire (or faintly and irregularly denticulate); upper surface (sub)glabrous or very sparsely whitish strigillose, smooth, lower surface sparsely (to rather densely) whitish strigillose to puberulous on the veins, smooth, cystoliths above and beneath; lateral veins (4–)6–10 pairs, none of them branched or furcate far from the margin, tertiary venation subreticulate to loosely scalariform; 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 cm long, whitish strigillose to appressed-puberulous, the epidermis flaking off; stipules 0.5–1 cm long, whitish appressed-puberulous, caducous. *Figs* cauliflorous to flagelliflorous (?) on (rather) slender branchlets (or stolons?) up to 1.5 m long (and with caducous stipules) on the trunk; peduncle 0.4–1.5 cm long; basal bracts 3, verticillate, c. 1 mm long; receptacle subglobose, 0.4–1 cm diam. when dry, white or whitish appressed-puberulous, non-stipitate or up to 0.3 cm long stipitate, (faintly) 5- or 6-ribbed, without lateral bracts, colour at maturity unknown, apex ± convex to flat, ostiole 2–3 mm diam., surrounded by 5 or 6 short apical bracts; internal bristles ± abundant, white to brownish, longer than the flowers.

Distribution. — *Malesia*: Philippines (Luzon, Mindoro, Samar, Mindanao).

Habitat — Forest, at low altitudes.

Notes — 1. This species is closely related to *F. ribes* from which it differs in the whitish indumentum on the leafy twigs and the whitish puberulous figs. Corner (1960) treated this taxon as a variety of *F. ribes*. It is also closely related to *F. linearifolia* from which it can be distinguished by the whitish indumentum of the figs and the leafy twigs and the smaller dimensions of the lamina.

2. A narrow-leaved form is quite common; such a form is also found in the related *F. linearifolia*.

48. Ficus d'albertisii King

Ficus d'albertisii King, J. Asiat. Soc. Bengal, Pt. 2, 4 (1886) 64; Sp. Ficus 2 (1888) 172, t. 216; Diels, Bot. Jahrb. Syst. 67 (1935) 212; Corner, Gard. Bull. Singapore 21 (1965) 87.
Ficus pachythyrsa auct. non Diels: Summerh., J. Arnold Arbor. 22 (1941) 100.

Tree up to 10 m (or more?) tall. *Leafy twigs* 3–5 mm thick, brown hirtellous to strigillose, with nodal waxy glands, internodes hollow; periderm flaking off. *Leaves* spirally arranged or (sub)opposite; lamina (broadly) elliptic to (sub)obovate, 15–24 by 8–12.5 cm, symmetric, chartaceous, apex acuminate, base obtuse to subcordate, margin denticulate to dentate; upper surface hispidulous to strigillose, scabrous, lower surface (rather) densely whitish to brownish hirtellous on the veins, scabridulous to smooth; cystoliths only beneath; lateral veins 7–10 pairs, some of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of lateral veins in the middle of the lamina; petiole 1.5–4.5 cm long, hirtellous, the epidermis persistent; stipules c. 2–3 cm long, brown strigose, caducous. *Figs* cauliflorous on stout spine-like unbranched (or sparingly branched) up to 50 cm long branchlets, on the trunk and on the main branches (?), the nodes prominent; peduncle 1–2 cm; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose to pyriform, c. 1.2–1.5 cm diam. when dry, glabrous, without lateral bracts, ribbed, colour at maturity unknown, apex flat, ostiole 3–4 mm diam., including a rosette of small apical bracts; internal hairs abundant, brown.

Distribution — *Malesia*: New Guinea (eastern).

Habitat — Forest, at low altitudes.

Note — The species shows clear affinities to *F. pachyrrhachis* from which it differs in the less frequent branched or furcate lateral veins and in the shorter basal bracts.

49. Ficus decipiens Reinw. ex Blume

Ficus decipiens Reinw. ex Blume, Bijdr. (1825) 479; Miq., Fl. Ind. Bat. 1, 2 (1859) 297; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291; King, Sp. Ficus 2 (1888) 93, t. 121; Koord., Minah. (1898) 598; Corner, Gard. Bull. Singapore 21 (1965) 90.

Sparingly branched shrub or treelet up to 3 m tall. *Leafy twigs* 7–10 mm thick, brown setose-hirsute, without nodal waxy glands; internodes hollow; periderm persistent. *Leaves* spirally arranged, ± tufted; lamina pandurate, 25–50 by 10–22 cm, symmetric, chartaceous, apex acuminate, base cordate, margin ciliate with brown hairs, coarsely dentate, towards the apex sublobate; upper surface whitish strigose, ± scabrous, lower surface whitish hirtellous and on the (main) veins also subsetose-hirsute, smooth, cystoliths only beneath; lateral veins 7–10 pairs, most of them furcate far from the margin, tertiary venation reticulate to subscalariform; waxy glands in the axils of the basal pair and of some other lateral veins and in furcations of lateral veins; petiole 1–2.5 cm long, brown subhirsute, the epidermis persistent; stipules 3–7.5 cm long, subglabrous or sparsely appressed-puberulous and on the keel and the apex brown subsetose-hirsute, (sub)persistent. *Figs* axillary, solitary (?), sessile; basal bracts 3, subverticillate, 8–10(–15?) mm long; receptacle subglobose, when dry 1.5–2.5 cm diam., brown hirsute, glabrescent, without lateral bracts, yellow at maturity, apex slightly convex,

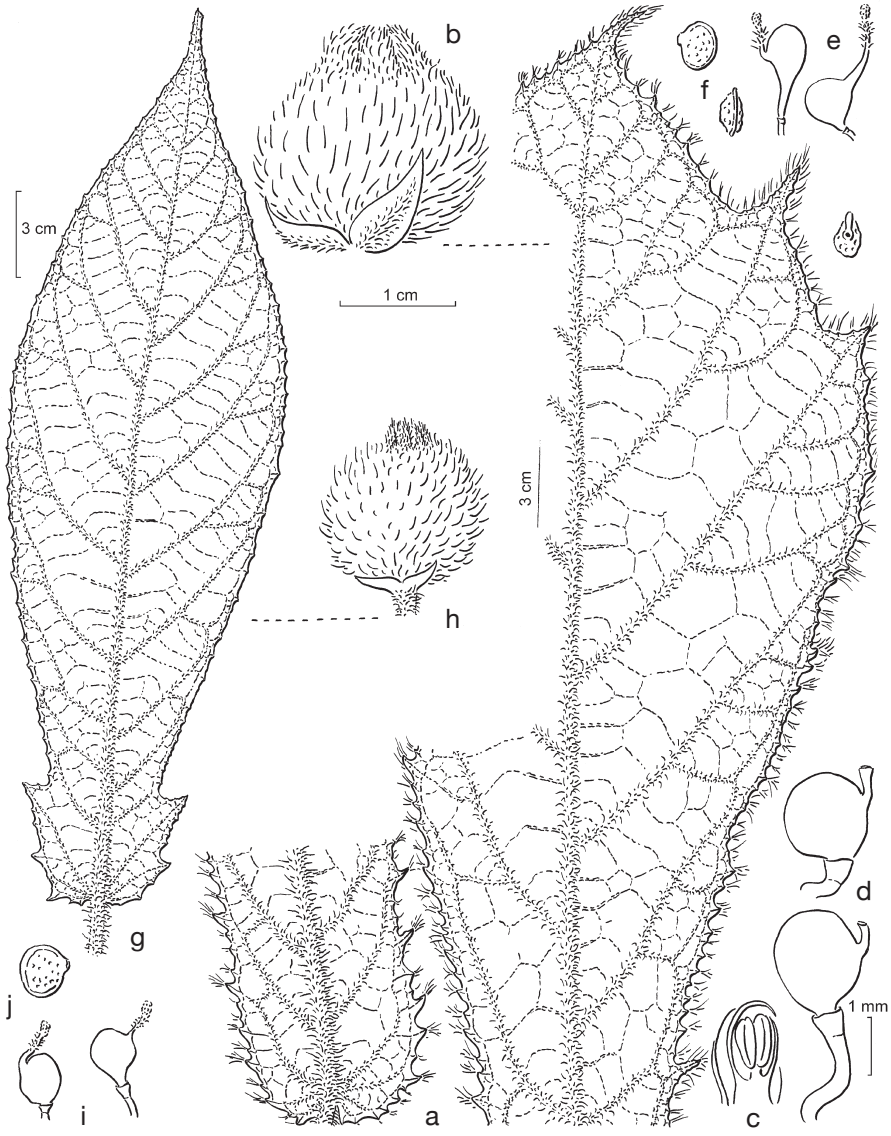


Fig. 82. a–f: *Ficus decipiens* Reinw. ex Blume. a. Lamina; b. fig; c. staminate flower; d. short-styled flowers; e. long-styled flowers; f. fruits. — g–j: *Ficus saurauioides* Diels. g. Leaf; h. fig; i. long-styled flowers; j. fruit (a: *Koorders 19172*; b–f: collections used unknown; g: *Docters van Leeuwen 9095*; h–j: *Ledermann 7224*). From Philos. Trans., Ser. B, 281 (1978) 399.

ostiole c. 5 mm diam., surrounded by 2 or 3 rows of ± erect apical bracts; internal hairs absent. — **Fig. 82a–f; Map 10.**

Distribution — *Malesia*: Celebes (Minahassa).

Habitat — Submontane forest, at altitudes between 600 and 1600 m.

Note — This species shows close affinities to *F. saurauioides*.

50. **Ficus dimorpha** King

Ficus dimorpha King, Sp. Ficus 2 (1888) 111, t. 145B; Corner, Gard. Bull. Singapore 21 (1965) 93.
Ficus dimorpha King var. *scabra* Corner, Gard. Bull. Singapore 18 (1960) 62.

Tree up to 10 m tall. *Leafy twigs* 3–7 mm thick, whitish patent-puberulous to subglabrous, with nodal waxy glands; internodes hollow; periderm flaking off. *Leaves* spirally arranged to subdistichous or (partly) (sub)opposite; lamina elliptic to oblong, 7–25 by 4–16 cm, (almost) symmetric to ± asymmetric, subcoriaceous, apex acuminate, base subcordate to rounded (or to subcuneate), margin ± irregularly (and faintly) dentate, usually slightly revolute (towards the base); upper surface (sub)glabrous or sparsely puberulous (on the midrib) or hispidulous, smooth or scabrous, lower surface patent-puberulous to subhispidulous on the veins, ± scabrous, cystoliths only beneath; lateral veins 6–8(–9) pairs, most or some of them branched or furcate far from the margin, tertiary venation loosely scalariform; waxy glands in the axils of some of the lateral veins in the middle part of the lamina and in furcations of lateral veins; petiole 1–6(–8) cm long, patent-puberulous to subglabrous, the epidermis flaking off; stipules 0.8–2(–2.8) cm long, sparsely to rather densely appressed-puberulous to strigillose (or subglabrous), caducous. *Figs* cauliflorous on woody tubercles or on up to 4(–10) cm long branched branchlets, on the older wood down to the trunk; peduncle (0.4–)1–2.5 cm long, densely puberulous; basal bracts 3, (usually) verticillate, 0.5–1 mm long; receptacle subglobose to ± depressed-globose, 1.2–2 cm diam. when dry, up to 3 cm diam. when fresh, mostly 0.1–0.8 cm long stipitate, ± densely puberulous, without lateral bracts, yellowish at maturity, apex ± convex to concave, ostiole c. 3 mm diam.; internal hairs absent.

Distribution — *Malesia*: Sumatra (incl. Mentawei Islands).

Habitat — Forest, at altitudes up to c. 1100 m.

Notes — 1. This species is probably very closely related to *F. fistulosa*, and might merit only recognition at the subspecific level. It can be readily distinguished from *F. fistulosa* by the patent indumentum on the leafy twigs, on the lamina beneath, and on the fig peduncle and receptacle. The lamina is ± scabrous beneath or above as well.

2. The figs of the type material differ from those of the other collections by the very long peduncle (up to 5 cm long) and the ostiole of c. 4.5 mm diam., possibly abnormally (teratologically) developed.

51. **Ficus fistulosa** Reinw. ex Blume

Ficus fistulosa Reinw. ex Blume, Bijdr. (1825) 470; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 284, 296; Kurz, Forest Fl. Burma 2 (1877) 459; King, Sp. Ficus 2 (1888) 114, t. 150, 151; Fl. Brit. India 5 (1888) 525; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 24 (1899) 459; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 205; Renner, Bot. Jahrb. Syst. 39 (1907) 398; Koord., Atlas Baumart. Java 4 (1918) t. 765; Merr., Enum. Born. (1921) 223; Ridl., Fl. Malay Penins. 3 (1924) 343; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 570; Gagnep., Fl. Indo-Chine 5 (1928) 817; Ochse & Bakh., Veg. Dutch East Indies (1931) 496; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 26, f. 12, 13; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1009; Corner, Wayside Trees (1940) 684; Backer & Bakh.f., Fl. Java 2 (1965) 28, 29, 32; Corner, Gard. Bull. Singapore 21 (1965) 93; Kochummen, Tree Fl. Malaya 3 (1978) 146; Tree Fl. Sabah & Sarawak 3 (2000) 274.

Covellia subopposita Miq., Pl. Jungh. (1851) 66; Fl. Ind. Bat. 1, 2 (1859) 327; Fl. Ind. Bat., Suppl. (1861) 435; Choix Pl. Buitenzorg (1864) t. 15.

Covellia tuberculata Miq. in Zoll., Syst. Verz. 2 (1854) 94, 99; Fl. Ind. Bat. 1, 2 (1859) 325. — *Ficus tuberculata* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 283, 296, non Roxb. 1832.

?*Ficus millingtonifolia* Griff., Notul. Pl. Asiat. 4 (1854) 396; Ic. Pl. Asiat. 4 (1854) t. 556 (1).

Ficus harlandii Benth., Fl. Hongk. (1861) 330; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; King, Sp. Ficus 2 (1888) 113, t. 148; Gagnep., Fl. Indo-Chine 5 (1928) 772.

Ficus tengerensis Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 283, 296. — *Ficus fistulosa* Reinw. ex Blume var. *tengerensis* (Miq.) Kuntze, Rev. Gen. Pl. 1 (1891) 626; Corner, Gard. Bull. Singapore 21 (1965) 93; Kochummen, Tree Fl. Malaya 3 (1978) 147.

Ficus fistulosa Reinw. ex Blume var. *angustifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 284; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 28; Gard. Bull. Singapore 21 (1965) 93; Kochummen, Tree Fl. Malaya 3 (1978) 147.

Ficus fistulosa Reinw. ex Blume var. *obliqua* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 284.

Ficus condensa King, Sp. Ficus 2 (1888) 113, t. 149; Merr., Enum. Born. (1921) 222; Corner, Gard. Bull. Singapore 21 (1965) 93.

Ficus repandifolia Elmer, Leafl. Philipp. Bot. 1 (1906) 58; 1 (1907) 256; 4 (1911) 1321; 7 (1914) 2392; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 63; Elmer, Leafl. Philipp. Bot. 9 (1937) 3448; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 315.

Ficus rubrovenia Merr., Philipp. J. Sci., 1, Suppl. (1906) 44; Philipp. J. Sci., Bot. 2 (1907) 270; Sp. Blancoan. (1918) 127.

Ficus lucbanensis Elmer, Leafl. Philipp. Bot. 1 (1907) 254; 2 (1908) 541; 4 (1911) 1254; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 56; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 272. — *Ficus fistulosa* Reinw. ex Blume var. *lucbanensis* (Elmer) Corner, Gard. Bull. Singapore 18 (1960) 62; 21 (1965) 93.

Ficus curranii Merr., Philipp. J. Sci., Bot. 5 (1910) 343; Enum. Philipp. Flow. Pl. 2 (1923) 51.

Ficus grandidens Merr., Philipp. J. Sci., Bot. 9 (1914) 271; Enum. Philipp. Flow. Pl. 2 (1923) 53; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 316.

Ficus polysyce Ridl., J. Straits Branch Roy. Asiat. Soc. 82 (1920) 195 p.p.; Fl. Malay Penins. 3 (1924) 342; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 42. — Syntypes: *Alvins 927*, *Cantley 1882*, *Curtis 1749*, *Goodenough 1945*, *Kunstler 10196*, *Ridley, 1175*, *1892*, *7202*, *7627*, *11035*. all in K and from various places in Peninsular Malaysia and Singapore, representing a mixture of *F. fistulosa*, *F. schwarzii* Koord., *F. scortechinii* King, and *F. variegata* Blume, fide Corner (1965) 98; as the description is largely matching *F. fistulosa*, *Ridley 1175*, Malaysia, Pahang, Pekan, is here designated as lectotype.

Ficus fistulosa Reinw. ex Blume var. *cincta* Hochr., Candollea 2 (1925) 331.

Tree up 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, on ultimate branches distichous; lamina oblong to subobovate to (ob)lanceolate (to elliptic), (4–)8–22(–34) by (1.5–)4–9(–17) cm, symmetric or ± asymmetric, subcoriaceous, apex acuminate to caudate, base cuneate to rounded (to subcordate), margin entire or (in particular towards the apex) ± 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 beneath; 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 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 cauliflorous on up to 4(–10) cm long branchlets (or elongating to 40 cm or more?), on the older wood down to the trunk; peduncle (0.2–)1–4(–6) cm long; basal bracts 3, (usually) verticillate, 0.5–1 mm long; receptacle subglobose to obovoid to subpyriform, 0.6–1.5(–2.5?) cm diam. when dry, 1–2(–4?) cm diam. when fresh, mostly 0.1–1 cm long stipitate, (sub)glabrous, lateral bracts absent, sometimes obscurely to distinctly ribbed, without lateral bracts, yellowish (or red) at maturity, apex ± convex to concave, ostiole 1.5–3 mm diam.; internal hairs absent. — **Map 12.**

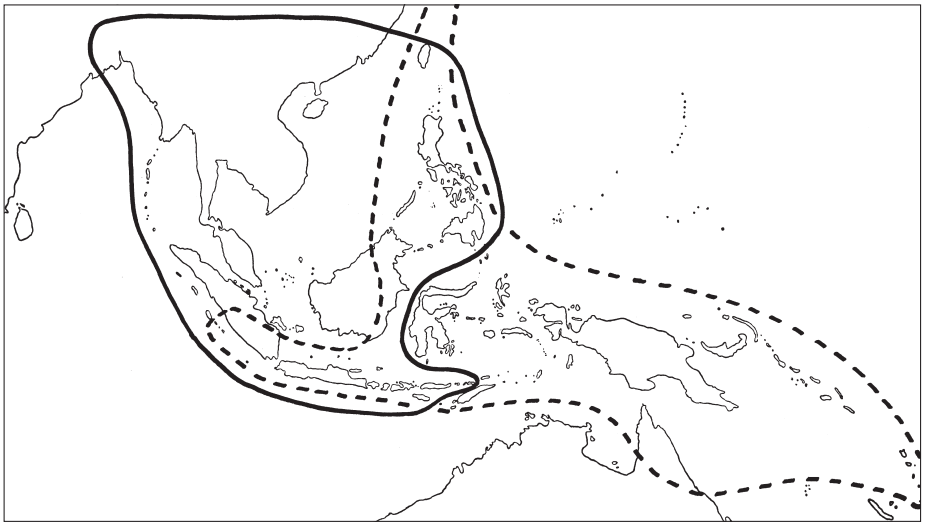
Distribution — NE India to S China, Taiwan, and Malesia; in *Malesia*: Malay Peninsula, Sumatra, Java, Borneo, Philippines, Celebes, Lesser Sunda Islands (Bali, Lombok, Sumba, Sumbawa, Flores, Alor), New Guinea (near Sukarnapura, near Madang).

Habitat — Forest, at altitudes up to 2000 m.

Notes — 1. The species is very variable in size and shape of the lamina and in the shape and position of the figs. It is not quite clear whether the presence of figs in the leaf axils is linked to their presence (on woody tubercules) on the older wood, or whether it is a matter of early stages of development, or whether it is to some extent related to occurrence at high altitudes.

2. The sparsely hairy form of *F. congesta* resembles very much *F. fistulosa*, in particular, in the western part of its range of distribution, where the figs tend to match the dimensions of those of *F. fistulosa*. It is in its vegetative parts often more or less distinct in the relatively large lamina of which the base varies from cuneate to subcordate. It is clearly distinct in the fig-bearing branches, which are slender and at least 10 cm long, but may elongate to at least 40 cm.

3. In material with axillary figs the petiole is mostly relatively short, on average longer in material with cauliflorous figs.



Map 12. Distribution of some species of subg. *Sycomorus* subsect. *Sycocarpus: F. fistulosa* Reinw. ex Blume (continuous line); *F. septica* Burm.f. (broken line).

4. In the Philippines, the leaf margin can be lobate.

5. Plants can start flowering as a sapling.

6. Corner (1965) regarded some material from Borneo placed in *F. condensa* as distinct from *F. fistulosa* largely on the basis of the fig receptacle turning red at maturity and some features of the long-styled flower: the presence of hairs on the style and a very short perianth. However, these flower characters are variable in *F. fistulosa* and even in material referred to *F. condensa*. The difference in colour seems not to be a character strong enough to justify recognition at species level.

7. A single collection from New Guinea, near Sukarnapura, thus occurring clearly isolated from the known (main) range of distribution, belongs without doubt to this species.

52. Ficus flagellaris Diels

Ficus flagellaris Diels, Bot. Jahrb. Syst. 67 (1935) 216; Corner, Gard. Bull. Singapore 21 (1965) 94.

Tree up to 6 m tall. *Leafy twigs* 2.5–4 mm thick, glabrous or strigillose on the nodes, without nodal waxy glands; internodes hollow (?); periderm flaking, persistent. *Leaves* laxly spirally arranged to (sub)distichous; lamina oblong to elliptic, 5–13–16 by 2.5–6 cm, slightly asymmetric, chartaceous, apex acuminate, base obtuse to cuneate, margin crenate-denticulate; upper surface sparsely brownish strigillose, smooth, lower surface rather sparsely brownish strigillose on the main veins, smooth, cystoliths only beneath; lateral veins (4 or) 5 or 6 pairs, in the middle part of the lamina often branched or furcate far from the margin, tertiary venation loosely scalariform; waxy glands in the axils of some lateral veins in the middle part of the lamina; petiole 1.5–3 cm long, glabrous, the epidermis persistent; stipules 0.5–1 cm long, glabrous, caducous (or subpersistent?). *Figs* cauliflorous on up to c. 1 m long branched leafless branchlets (with up to 10 cm long internodes and up to 1.5 cm long persistent stipules) on the trunk; peduncle 0.3–0.4 cm long; basal bracts 3, verticillate, 1.5–2 mm long; receptacle subglobose, 0.8–1.5 cm diam. when dry, glabrous, pulverulent, non-stipitate, without lateral bracts, colour at maturity unknown, apex slightly convex to flat, ostiole 2.5–3 mm diam.; internal hairs absent.

Distribution — *Malesia*: New Guinea (eastern)

Habitat — Forest, at altitudes of 2000–2100 m.

Note — This species has been included in *F. ternatana* by Corner (1965), but it is currently treated as distinct, being clearly different in the cauliflory, the smaller figs, the glabrous stipules, and the presence of waxy glandular spots.

53. Ficus francisci H.J.P. Winkl.

Ficus francisci H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 362; Corner, Gard. Bull. Singapore 21 (1965) 91; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 276.

Tree up to 8 m. *Leafy twigs* 3–5 mm thick, whitish to pale brown (sub)hirsute to subvillous, with hairs often ± retrorse, without nodal glands; internodes hollow; periderm persistent; scars of leaves conspicuous. *Leaves* spirally arranged; lamina subobovate to oblong, (5–)10–22(–33) by (2.5–)4–8(–14) cm, (almost) symmetric, chartaceous,

Fig. 83. *Ficus francisci* H.J.P. Winkl. a. Leafy twig; b. fig-bearing branchlet; c. fig; c'. ostiole; d. long-styled flowers; e. fruits (all: *Endert 4723*).

apex acuminate, base rounded to subcordate, margin denticulate towards the apex; upper surface whitish substrigose, smooth, lower surface rather densely to sparsely whitish to brown villous on the (main) veins, smooth, cystoliths only beneath; lateral veins 10–17 pairs, some or most of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins and furcations of lateral veins; petiole (1–)5–13 cm long, whitish (sub)hirsute, the epidermis persistent; stipules 1.5–2.5 cm long, brownish subhirsute to strigose on (and along) the keel or also whitish appressed-puberulous, subpersistent (or caducous). *Figs* cauliflorous on stout branched up to 40 cm long branchlets with short internodes, prominent scars, and up to 0.5 cm long subpersistent stipules, on the base of the trunk (and ending in the soil); peduncle 0.2–0.5 cm long; basal bracts, verticillate, 2–5 mm long; receptacle pyriform to obovoid, 1.5–2.5 cm diam. when dry, up to 5 cm diam. when fresh, (sub)glabrous, without lateral bracts, ribbed, distinctly so at the apex of the receptacle, yellow or brown at maturity, apex flat to slightly concave, ostiole 4–5 mm diam.; internal hairs abundant white or brownish; wall thick. — **Fig. 83.**

Distribution — *Malesia*: Borneo.

Habitat — Forest, often near streams and on cliffs, at altitudes up to 1400 m.

54. Ficus geocarpa Teijsm. ex Miq.

Ficus geocarpa Teijsm. ex Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 231, 296; Koord., Minah. (1898) 600; Corner, Gard. Bull. Singapore 21 (1965) 91.
Ficus dichrothrix Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 272.
Ficus geocarpa auct. non Teijsm. ex Miq.: King; Merr. = *F. uncinata* Becc.

Tree up to 15 m tall. *Leafy twigs* 3–6 mm thick, brown hirsute, the longer stiff hairs intermixed with shorter and softer white hairs, with nodal glands; internodes hollow; periderm persistent. *Leaves* distichous; lamina oblong to subobovate, (13–)20–50 by (4.5–)9–17 cm, asymmetric (to nearly symmetric), chartaceous, apex acuminate, base rounded to subcordate at the narrow side, cordate at the broad side, but lobe not covering the petiole, margin (towards the apex) denticulate to dentate; upper surface strigose, ± scabrous, on the midrib hirtellous, lower surface brown(ish) hirsute, the longer stiff hairs intermixed with shorter and softer white hairs, ± scabrous, cystoliths only beneath; lateral veins (6–)7–12 pairs, some or most of them furcate far from the margin, tertiary venation (rather loosely) scalariform, in the upper part of the lamina reticulate; waxy glands in the axils of some lateral veins in the middle part of the lamina and in furcations of the lateral veins, sometimes also a single large one in the axil of the basal lateral vein at the broad side of the lamina; petiole 0.5–2(–3) cm long, brown hirsute, the longer stiff hairs intermixed with shorter and softer white hairs, the epidermis persistent; stipules 1.5–4 cm long, white appressed-puberulous to subsericeous, partly (on the keel) brown strigose to subhirsute, caducous. *Figs* flagelliflorous on up to 8 m long, sparsely branched stolons with up to 3.5 cm long internodes; peduncle 0.5–1.5 cm long; basal bracts 3(–7), verticillate (or not), c. 3 mm long; receptacle depressed-globose to turbinate, 1.2–1.6 cm diam. when dry, brown hirtellous, (faintly) ribbed towards the ostiole, with few short lateral bracts, at maturity yellow, apex ± concave; ostiole c. 2 mm diam., flat; internal hairs absent.

Distribution — *Malesia*: Celebes (Minahassa, Menado), possibly also Java.

Habitat — Lowland forest.

Note — This species is probably closely related to *F. gilapong*, the major difference being the length of the petiole.

55. Ficus geocharis Corner

Ficus geocharis Corner, Gard. Bull. Singapore 18 (1960) 60; 21 (1965) 92; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 277.

Tree up to 13 m tall. *Leafy twigs* 2–3 mm thick, brown hirsute to subvillous, the longer stiff hairs intermixed with shorter and softer white hairs, with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* distichous; lamina oblong to lanceolate, (6–)10–38 by (2–)3–9 cm, asymmetric, chartaceous, apex caudate, the acumen denticulate, base cuneate to cordate on the narrow side, cordate-auriculate on the broad side, margin obscurely denticulate to subentire, upper surface puberulous to hirtellous on the midrib, smooth (or ± scabrous), lower surface brown (sub)hirsute on the veins, the longer stiff hairs intermixed with shorter and softer white hairs, smooth, cystoliths only beneath; lateral veins 6–10 pairs, none of them branched or furcate far from the margin, tertiary venation scalariform, partly running perpendicular to the midrib; waxy glands in the axils of some lateral veins in the middle part of the lamina; petiole 0.3–1 cm long, white puberulous and brown hirsute, the epidermis persistent; stipules 1.5–4 cm long, caudate, white puberulous and brown hirsute, subpersistent. *Figs* flagelliflorous on up to 3 m (or more) long stolons with up to c. 10 cm long internodes; peduncle up to 0.5 cm long or subsessile; basal bracts 3–5, ± scattered, gradually passing into the lateral bracts, 3–5 mm long; receptacle subglobose, when dry 1.5–2 cm diam., brown hirsute to hirtellous, with numerous lateral bracts, up to 10 mm long, the upper ones ± incurved, red-purple at maturity, apex ± convex, ostiole 5–6 mm diam., flat to slightly prominent, surrounded by erect apical bracts; internal hairs absent.

Distribution — *Malesia*: Borneo.

Habitat — Lowland forest.

56. Ficus gilapong Miq.

Ficus gilapong Miq., Fl. Ind. Bat., Suppl. (1861) 426; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292 (sub *F. serraria* Miq.); Corner, Gard. Bull. Singapore 21 (1965) 91.

Tree up to 10 m. *Leafy twigs* 2–8 mm thick, pale brown to whitish hirtellous, the longer stiff hairs intermixed with sparse shorter and softer white hairs, with nodal glands; internodes hollow; periderm persistent. *Leaves* spirally arranged or (sub)-opposite; lamina oblong, 15–35 by 6–12.5 cm, (almost) symmetric to ± asymmetric, chartaceous, apex acute to subacuminate, base cuneate to subcordate, margin dentate to denticulate; upper surface strig(ill)ose and hirtellous on the midrib, scabrous, lower surface hirtellous to puberulous on the veins, ± scabrous, cystoliths only beneath; lateral veins 8–10 pairs, some or most of them branched or furcate far from the margin, basal pair (faintly) branched, tertiary venation scalariform; waxy glands in the axils of some lateral veins in the middle part of the lamina and also in furcations of lateral veins; petiole 1–9 cm long, whitish to pale brown hirtellous, the epidermis persistent;

stipules 0.8–1.2 cm long, whitish to brownish strig(ill)ose to subsericeous to subhirsute, caducous. *Figs* cauliflorous on unbranched or branched leafless with up to 60 cm long branchlets, with up to 6 cm long internodes, but on the branches the internodes very short, stipules caducous; peduncle 0.5–2 cm long; basal bracts, verticillate or ± scattered, c. 2 mm long; receptacle subglobose to subpyriform to depressed-globose, 1.5–2.8 cm diam. when dry, up to 4 cm diam. when fresh, often up to c. 0.5 cm long stipitate, rather densely puberulous, with some lateral bracts, hardly ribbed, yellowish at maturity, apex slightly convex to concave, ostiole 3–4 mm diam.; internal hairs absent.

Distribution — *Malesia*: Sumatra (Atjeh) and Malay Peninsula.

Habitat — Forest, along streams, at low altitudes.

Notes — 1. This species resembles *F. hypogaea* in the features of the leaves and indumentum; it differs in the shorter stipules and the presence of waxy glands in the axils of lateral veins in the middle part of the lamina. *Ficus gilapong* is apparently not geocarpic, in contrast to *F. hypogaea*. The hairy and non-ribbed fig receptacle of *F. gilapong* is much larger than that of *F. hypogaea*, which is glabrous and distinctly ribbed.

2. Corner (1965) combined these two species: but Miquel's description of *F. gilapong* (1861) and the features of the sterile collection on which it was based justify recognition as a distinct species.

57. Ficus hahliana Diels

Ficus hahliana Diels, Bot. Jahrb. Syst. 67 (1935) 211; Summerh., J. Arnold Arbor. 22 (1941) 99; Corner, Gard. Bull. Singapore 21 (1965) 87.

Treelet up to 6 m tall. *Leafy twigs* 2–4 mm thick, dark brown (sub)hirsute, with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* spirally arranged to (sub)opposite; lamina oblong to subobovate or to elliptic, 12–28 by 5–9 cm, asymmetric, chartaceous, apex acuminate, base rounded to subcordate at the broad side, cuneate to obtuse (to rounded) at the narrow side, margin (towards the apex) denticulate; upper surface strigillose to subhispidulous, ± scabrous, lower surface brown subhirsute to hirtellous on the veins, ± scabrous, cystoliths only beneath; lateral veins (3–)6–10 pairs, none of them, but in larger leaves sometimes one or some furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of some lateral veins in the middle part of the lamina; petiole 0.5–1.5 cm long, brown subhirsute to hirtellous, the epidermis persistent; stipules 1.5–2.5 cm long, brown strigose to hirtellous, partly whitish strigillose to appressed-puberulous, subpersistent. *Figs* cauliflorous, clustered on short, ± tuberculate branchlets on main branches and the trunk; peduncle 0.5–1 cm long; basal bracts 3, verticillate, 2–3 mm long; receptacle subglobose to obovoid to depressed-globose, 1.3–1.8 cm diam. when dry, often 1–2 mm long stipitate, glabrous, 10-ribbed, without lateral bracts, colour at maturity unknown, apex flat to slightly concave, ostiole 2–3 mm diam., surrounded by 5 short apical bracts; internal hairs abundant, brown.

Distribution — *Malesia*: New Guinea.

Habitat — Lowland forest, along streams (on rocks).

58. Ficus hispida L.f.

Ficus hispida L.f., Suppl. Pl. (1782) 442; Lam., Encycl. 2, 2 (1788) 499; Blume, Bijdr. (1825) 469; Benth., Fl. Hongk. (1861) 329; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 282, 296; Benth., Fl. Austral. 6 (1873) 176; Kurz, Forest Fl. Burma 2 (1877) 460; King, Sp. Ficus 2 (1888) 116, t. 154, 155; Fl. Brit. India 5 (1888) 522; Watt, Dict. Econ. Prod. India 3 (1890) 354; Kuntze, Rev. Gen. Pl. 1 (1891) 627; Trimen, Fl. Ceyl. 4 (1898) 94; Koord., Teijsmannia 11 (1900) 558; F.M. Bailey, Queensl. Fl. 5 (1902) 1478; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 208; Renner, Bot. Jahrb. Syst. 39 (1907) 398; F.M. Bailey, Compr. Cat. Qld. Pl. (1913) 504; Koord., Atlas Baumart. Java 4 (1918) t. 766, 767; Merr., Enum. Born. (1921) 224; Ridl., Fl. Malay Penins. 3 (1924) 342; Hochr., Candollea 2 (1925) 331; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 572; Gagnep., Fl. Indo-Chine 5 (1928) 810; Hand.-Mazz., Symb. Sin. 7 (1929) 94; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 31, f. 16, 17; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1010; Alston, Kandy Fl. (1938) 34, f. 173; Corner, Wayside Trees (1940) 685, f. 252; M.F. Barrett, Am. Midl. Nat. 45 (1951) 147; Worth., Ceylon Trees (1959) f. 409; Backer & Bakh.f., Fl. Java 2 (1965) 28; Corner, Gard. Bull. Singapore 21 (1965) 89; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 154, t. 27; Kochummen, Tree Fl. Malaya 3 (1978) 149. — *Gonusuke hispida* (L.f.) Raf., Sylv. Tellur. (1838) 58. — *Covellia hispida* (L.f.) Miq., London J. Bot. 7 (1848) 462; Pl. Jungh. (1851) 67; Fl. Ind. Bat. 1, 2 (1859) 323.

Ficus symphytifolia Lam., Encycl. 2, 2 (1788) 498; Miq., Fl. Ind. Bat. 1, 2 (1859) 301.

Ficus scabra Jacq., Plant. Rar. Hort. Caes. Schoenbr. 3 (1798) 36, t. 315, non G. Forst. 1786. — *Gonusuke scabra* (Jacq.) Raf., Sylv. Tellur. (1838) 58.

Ficus mollis Willd., Acta Acad. Berol. (1798) 103, t. 5.

Ficus oppositifolia Roxb., Pl. Coromandel 2 (1799) 14, t. 124; Willd., Sp. Pl. 4 (1806) 1151; Roxb., Fl. Ind., ed. Carey 3 (1832) 561; Wight, Ic. 2 (1843) t. 638; Griff., Ic. Pl. Asiat. 4 (1854) t. 560. — *Covellia oppositifolia* (Roxb.) Gasp., Rendiconti Reale Accad. Sci. Fis. 25 (1845) 85, t. 8, f. 36–42; Dalzell & A. Gibson, Bombay Fl. (1861) 243.

Ficus perinteregam Pennant, Outl. Globe 4 (1800) 313; [*Perin-teregam* Rheede, Hort. Mal. 3 (1682) 81, t. 61]; Merr., J. Arnold Arbor. 29 (1948) 189.

Ficus daemonum J. König ex Vahl, Enum. Pl. 2 (1805) 198; Wight, Ic. 2 (1843) t. 641. — *Gonusuke daemonum* (J. König ex Vahl) Raf., Sylv. Tellur. (1838) 58. — *Covellia daemonum* (J. König ex Vahl) Miq., London J. Bot. 7 (1848) 462; Dalzell & A. Gibson, Bombay Fl. (1861) 244.

Ficus fecunda Blume, Cat. (1823) 36.

Ficus goolereea Roxb., Fl. Ind., ed. Carey 3 (1832) 538.

Sycomorphe roxburghii Miq., Ann. Sci. Nat. Bot., Sér. 3, 1 (1844) 35.

Ficus prominens Wall. ex Miq., London J. Bot. 7 (1848) 236; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 291.

Covellia setulosa Miq., London J. Bot. 7 (1848) 462.

Covellia courtallensis Miq., London J. Bot. 7 (1848) 463. — *Ficus courtallensis* (Miq.) Baill., Hist. Pl. 6 (1875) 176.

Covellia wightiana Miq., London J. Bot. 7 (1848) 463.

Covellia assamica Miq., London J. Bot. 7 (1848) 464.

Covellia dasycarpa Miq., London J. Bot. 7 (1848) 464.

Ficus hispida L.f. forma *borneensis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 282.

Ficus hispida L.f. var. *incana* Kuntze, Rev. Gen. Pl. 1 (1891) 627.

Ficus hispida L.f. var. *viridis* Kuntze, Rev. Gen. Pl. 1 (1891) 627.

Ficus setistyla Warb., Feddes Repert. Spec. Nov. Regni Veg. 1 (1905) 77 (p.p. *fructuum*; alt. p. = *F. congesta* Roxb.).

Ficus letacqui H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8 (1910) 550; H. Lév., Fl. Kouy-Tchéou (1915) 531; Rehder, J. Arnold Arbor. 17 (1936) 82.

Ficus sambucixylon H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 9 (1911) 444.

Ficus hispidioides S. Moore, J. Bot. 61 (1923) 51; Diels, Bot. Jahrb. Syst. 67 (1935) 212.

Ficus hispida L.f. forma *obovifolia* Hochr., Candollea 2 (1925) 331.

Ficus poilanei Gagnep., Notul. Syst. (Paris) 4 (1927) 93; Fl. Indo-Chine 5 (1928) 820, f. 93, 94.

Shrub or tree up to 15 m tall. *Leafy twigs* 3–10 mm thick, brownish to whitish (sometimes retrorsely) strigose to hirtellous to strigillose to appressed-puberulous or to brown hirsute, usually with pairs of nodal waxy glands at the bases of the petioles; internodes hollow; periderm flaking off (often starting below the leaves). *Leaves* (sub)opposite or spirally arranged (or distichous); lamina oblong to elliptic to subobovate or to subovate, 5–25(–35) by 2.5–10(–16) cm, symmetric or slightly asymmetric, chartaceous, (lower surface often drying much paler than the upper surface), apex acuminate, base cuneate to subcordate, margin (often) crenate-dentate to denticulate (or to subserrate) or subentire; upper surface sparsely to rather densely strigillose to hispidulous to appressed-puberulous, ± scabrous or smooth, lower surface (rather) densely brownish to whitish strigose to hirtellous or to appressed-puberulous on the smaller veins, smooth, cystoliths only beneath; lateral veins (4–)6–10 pairs, the basal pair usually branched, short or up to 1/2 the length of the lamina, other lateral veins often branched or furcate far from the margin, tertiary venation scalariform, ± 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 1–10(–14) cm long, whitish strigose to brownish hirtellous to appressed-puberulous or hirsute, the epidermis flaking off; stipules (0.5–)1–2.5 cm long, whitish to brownish appressed-puberulous to strigose to hirtellous to subhirsute, caducous. *Figs* axillary, solitary (or in pairs), or cauliflorous to flagelliflorous on up to 1.5 m long branchlets arising in clusters from the main branches or trunk, sometimes trailing on the ground; peduncle 0.5–1.5(–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.

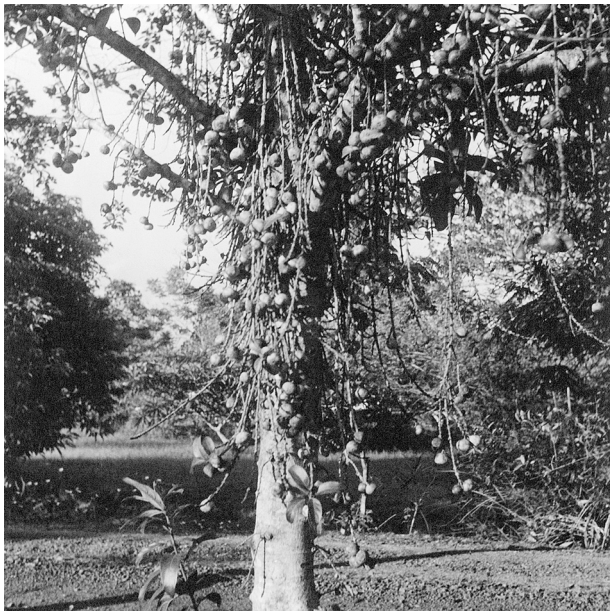


Fig. 84. *Ficus hispida* L.f. Trunk and lower branches with fig-bearing branchlets, Kedah, Peninsular Malaysia. Photo E.J.H. Corner.

when dry, up to 3.5 cm diam. when fresh, up to 0.6 cm long stipitate or non-stipitate, often ribbed, brownish to whitish puberulous or brown hirtellous, usually with a few lateral bracts, sometimes none, pale yellow (to brownish) at maturity, apex convex to flat or to concave, ostiole 2–4 mm diam., surrounded by 5 or 6 apical bracts; internal hairs absent. — **Fig. 84; Map 11.**

Distribution — Sri Lanka to India, S China, Andaman Islands, Australia (Queensland), and Malesia; in *Malesia*: Malay Peninsula (except the southern part), Sumatra, Java, Borneo (incl. Anambas & Natoena Islands), Celebes, Lesser Sunda Islands (Timor), Moluccas (Tanimbar Islands), New Guinea (eastern: Kanosia).

Habitat — Along rivers or in swamp edges, common in secondary growth, in drier climates; at low altitudes.

59. Ficus hypogaea King

Ficus hypogaea King, Sp. Ficus 2 (1888) 100, t. 125, excl. sched. born. quae est *F. uncinata*; Corner, Gard. Bull. Singapore 18 (1960) 56; 21 (1965) 91 (sub *F. gilapong*).

Tree up to 12 m. *Leafy twigs* 3–7 mm thick, white strigose or brownish hirtellous, the longer stiff hairs intermixed with shorter and softer white hairs, with nodal glands; internodes hollow; periderm flaking off. *Leaves* spirally arranged, sometimes subopposite; lamina oblong, (18–)26–38 by (7–)13–20 cm, slightly asymmetric, chartaceous, apex acute to subacuminate, base cuneate to subcordate, margin denticulate; upper surface strig(ill)ose or on the main veins also minutely puberulous, scabridulous (to smooth), lower surface strig(ill)ose and hirtellous to puberulous, the longer stiff hairs intermixed with shorter and softer white hairs, ± scabrous, cystoliths only beneath; lateral veins 10–12 pairs, some or most of them furcate far from the margin, the basal pair (faintly) branched, tertiary venation scalariform; waxy glands in the axils of the lateral veins (also the basal ones); petiole (1.5–)3–9 cm long, white to brown strigose to hirtellous, the epidermis persistent; stipules (1.5–)2.5–3 cm long, whitish to brownish subsericeous to subhirsute only on and along the keel, the whole surface minutely puberulous, caducous. *Figs* flagelliflorous on stolons with up to 6 cm long internodes; peduncle 0.3–0.7 cm long; basal bracts 3, verticillate, c. 2 mm long; receptacle subglobose, 0.8–1.5 cm diam. when dry, sparsely puberulous to subglabrous, without lateral bracts, ribbed towards the ostiole, orange to pinkish red at maturity, apex flat to ± convex, ostiole c. 3 mm diam.; internal hairs sparse, short.

Distribution — *Malesia*: Sumatra.

Habitat — Forest, at altitudes between 1000 and 1500 m.

Note — *Ficus hypogaea* and the related cauliflorous *F. gilapong* can be distinguished from other large-leaved stoloniferous species, such as *F. geocarpa*, by their long petioles. This species was reduced to a synonym of *F. gilapong* (Corner 1960, 1965).

60. Ficus iodotricha Diels

Ficus iodotricha Diels, Bot. Jahrb. Syst. 67 (1935) 216; Corner, Gard. Bull. Singapore 21 (1965) 88.

Tree up to 10 m tall. *Leafy twigs* 2.5–6 mm thick, dark brown hirsute to hirtellous, the longer hairs intermixed with (very) sparse white short and softer hairs, with nodal

waxy glands; usually with some ± conspicuous lenticels just below the scar of the stipules; internodes hollow; periderm persistent. *Leaves* spirally arranged to subdistichous (to subopposite); lamina elliptic to oblong to (sub)obovate, 9–29 by 3.5–12 cm, ± asymmetric to almost symmetric, chartaceous to subcoriaceous, apex acuminate, base cordate to subcordate to rounded, margin denticulate; upper surface whitish hirtellous to strigose to hispidulous, ± scabrous, lower surface brown hirsute to hirtellous on the veins, smooth (or scabridulous), cystoliths only beneath; lateral veins 4–9 pairs, mostly branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of some lateral veins in the middle part of the lamina; petiole 1–5 cm long, brown hirsute to hirtellous, the epidermis persistent; stipules (0.7–)1–2(–3) cm long, white puberulous and along the keel brown strigose to hirtellous, caducous. *Figs* cauliflorous to flagelliflorous on branched rather stout up to 40 cm long branchlets on the trunk and/or on up to 4 m long stolons with up to 6 cm long internodes; peduncle 0.5–2.3 cm long; basal bracts 3, verticillate (or ± scattered), 3–6 mm long; receptacle subglobose to obovoid to pyriform, (1–)1.5–3 cm diam. when dry, 4–5 cm diam. when fresh, non-stipitate or sometimes up to 2.5 cm long stipitate, densely (dark) brown hirtellous to subvelutinous to puberulous, glabrescent and the epidermis flaking off, lenticellate, often (faintly) ribbed, without lateral bracts, brown to purple-red at maturity, apex convex to flat, ostiole 5–9 mm diam., surrounded by 5 stiff apical bracts, prominent; internal hairs abundant, brown.

Distribution — *Malesia*: New Guinea.

Habitat — Montane forest (as *Nothofagus* and *Quercus* forest) or secondary growth, at altitudes between (700–)1500 and 2900 m.

Notes — 1. This species is mostly flagelliflorous but can be cauliflorous.

2. Waxy glands occasionally occur on the axils of the basal lateral veins.

61. Ficus ixoroides Corner

Ficus ixoroides Corner, Gard. Bull. Singapore 18 (1960) 63; 21 (1965) 94; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 281.

Ficus pseudotarennifolia Kochummen, Gard. Bull. Singapore 50 (1998) 210; Tree Fl. Sabah & Sarawak 3 (2000) 296.

Shrub or tree up to 6 m tall. *Leafy twigs* 1.5–2.5 mm thick, sparsely and minutely whitish puberulous to glabrous, with waxy nodal glands; internodes hollow; periderm flaking off. *Leaves* spirally arranged to subopposite; lamina linear-oblanceolate, 7–22 by 1–2.2 cm, almost symmetric, (sub)coriaceous, apex acuminate to acute, base cuneate, margin (sub)entire; both surfaces glabrous, smooth; cystoliths only beneath; lateral veins 7–13 pairs, unbranched, tertiary venation reticulate; waxy glands in the axils of some lateral veins in the middle part of the lamina; petiole 0.7–2 cm long, minutely puberulous, the epidermis flaking off; stipules 1–2 cm long, glabrous, caducous. *Figs* axillary and solitary or cauliflorous on up to 1 cm long spurs on the main branches; peduncle 0.2–0.4 cm long; basal bracts 3, verticillate, c. 0.5 mm long; receptacle subglobose to ellipsoid, 0.7–1 cm diam. when dry, non-stipitate or up to 0.2 cm long stipitate, glabrous, without lateral bracts, colour at maturity unknown, apex concave, ostiole 1.5–2 mm diam., surrounded by a low rim; internal hairs absent.

Distribution — *Malesia*: Borneo (Sarawak and N and C Kalimantan).

Habitat — Riverside forest, at altitudes up to c. 1000 m; sometimes (?) rheophytic.

Note — This species shows affinities to *F. fistulosa*.

62. Ficus latimarginata Corner

Ficus latimarginata Corner, Gard. Bull. Singapore 18 (1960) 55; 21 (1965) 91.

Sparingly branched shrub or treelet up to 4 m tall. *Leafy twigs* 6–10 mm thick, pale to dark brown hirsute to (sub)villous, without nodal waxy glands; internodes hollow; periderm persistent. *Leaves* spirally arranged; lamina oblong to subobovate to lanceolate, 14–30 by 4–11 cm, symmetric, chartaceous, apex acuminate, base rounded to subcordate, margin dentate to denticulate; upper surface brown pilose to subhirsute to subhispid, ± scabrous, lower surface brown to whitish pilose to subhirsute on the veins, scabridulous, cystoliths only beneath; lateral veins 8–12 pairs, most of them furcate far from the margin, tertiary venation reticulate; waxy glands in the axils of the basal pair and some other lateral veins and in furcations of lateral veins; petiole 1–2.5 cm long, pale to dark brown subhirsute to subvillous, the epidermis persistent; stipules 2–4 cm long, brown to whitish strigose to subhirsute along the keel, towards the margin white appressed-puberulous to glabrous, (sub)persistent. *Figs* axillary, in pairs, sessile; basal bracts 3, verticillate, 5–15 mm long; receptacle subglobose to ellipsoid, 1–2 cm diam. when dry, brown strigose to subhirsute, without lateral bracts, at maturity yellow, apex slightly convex, ostiole c. 5 mm diam.; internal hairs absent.

Distribution — *Malesia*: Celebes.

Habitat — Forest, at altitudes up to 1000 m.

Note — *Kjellberg 2280* deviates somewhat from other collections, as in the paler indumentum and the ellipsoid fig receptacle.

63. Ficus lepicarpa Blume

Ficus lepicarpa Blume, Bijdr. (1825) 459; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 283, 297; Solms, Bot. Zeit. (1885) 535, t. V, f. 1–5, 9, 10; King, Sp. Ficus 2 (1888) 118, t. 156; Fl. Brit. India 5 (1888) 525; Koord., Minah. (1898) 603; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 212; Renner, Bot. Jahrb. Syst. 39 (1907) 398; Koord., Atlas Baumart. Java 4 (1918) t. 768; Merr., Enum. Born. (1921) 224; Ridl., Fl. Malay Penins. 3 (1924) 343; Ochse & Bakh., Veg. Dutch East Indies (1931) 502; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 28, f. 14, 15; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1011; Corner, Wayside Trees (1940) 683, f. 252; Backer & Bakh.f., Fl. Java 2 (1965) 33; Corner, Gard. Bull. Singapore 21 (1965) 90; Kochummen, Tree Fl. Malaya 3 (1978) 150; Tree Fl. Sabah & Sarawak 3 (2000) 282. — *Covellia lepicarpa* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 328.

Covellia volkameriifolia Wall. ex Miq., London J. Bot. 7 (1848) 464, t. 8; Fl. Ind. Bat. 1, 2 (1859) 324. — *Ficus volkameriifolia* (Wall. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 283, 297, 308 nom. (in synon.); H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 363; Merr., Enum. Born. (1921) 224.

Covellia didyma Miq., Pl. Jungh. (1851) 65; Fl. Ind. Bat. 1, 2 (1859) 327.

Ficus lepicarpa Blume var. *bunjeng* Solms, Bot. Zeit. (1885) 538.

?*Ficus malaica* Hunter ex Ridl., J. Straits Branch Roy. Asiat. Soc. 53 (1909) 123.

Ficus lepicarpa Blume var. *brevibracteata* Corner, Gard. Bull. Singapore 18 (1960) 54.

Ficus lepicarpa Blume var. *pedunculata* Corner, Gard. Bull. Singapore 18 (1960) 54.

?*Ficus lepicarpa* Blume var. *suluensis* Corner, Gard. Bull. Singapore 18 (1960) 54.

Shrub or tree up to 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, without nodal waxy glands; internodes hollow; periderm (often) flaking off; scars of the leaves 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 to oblong to obovate to elliptic, (5–)8–24(–32) by (1.5–)3–11(–14) cm, symmetric or slightly asymmetric, subcoriaceous, apex acuminate, base obtuse to cuneate to truncate to 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 beneath; lateral veins 8–12 pairs, none or some (or most) of them branched or furcate far 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) white appressed-puberulous or glabrous, caducous or subpersistent. *Figs* mostly in pairs in the leaf axils, (sub)sessile (or with a peduncle up to 0.2 cm long); basal bracts 3, 1–7 mm long; receptacle subglobose to ellipsoid to obovoid (or to depressed-globose), 1–1.5 cm diam. when dry, 2–2.5 cm diam. when fresh, sparsely white or brownish puberulous, 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 4–6 mm diam., surrounded by 2 or 3 rows of ± erect apical bracts, the outer ones often at some distance from the ostiole; internal hairs absent. — **Map 10.**

Distribution — Lower Myanmar, Peninsular Thailand, and Malesia; in *Malesia*: Sumatra (and adjacent islands), Malay Peninsula (excl. Singapore), Java, Borneo (Saba, Sarawak, also Anambas and Natoena Islands), Philippines (Palawan and Sulu Archipelago), Celebes (Minahassa and S Celebes), Moluccas (Halmahera, Bacan, Obi, Buru, Ceram, Ambon).

Habitat — Forest and secondary growth, often along streams; at altitudes up to 1500 m.

Notes — 1. Material with short-pedunculate figs are found in Borneo, the Malay Peninsula (Johore), and the Moluccas. Material from Celebes and the Moluccas have mostly depressed-globose fig receptacles, whereas they are typically globose to ellipsoid or to obovoid.

2. The identity of var. *suluensis* Corner could not be verified.

64. Ficus limosa C.C. Berg

Ficus limosa C.C. Berg, Blumea 49 (2004) 172.

Treelet up to 5 m tall. *Leafy twigs* 2–4 mm thick, dark brown hirtellous, with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* spirally arranged to (sub)opposite; lamina oblong to subobovate to oblanceolate, 5–16 by 1.8–5.5 cm, slightly asymmetric to symmetric, chartaceous, apex acuminate, base cuneate to obtuse (to rounded), margin (sub)entire; upper surface densely whitish appressed-puberulous to strigillose, the midrib brown hirtellous, (almost) smooth, lower surface brown hirtel-

lous to strigillose on the main veins, on the smaller veins to white appressed-puberulous, smooth, cystoliths only beneath; lateral veins 6–10 pairs, none of them furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of some lateral veins in the middle part of the lamina; petiole 1–2 cm long, brown hirtellous, the epidermis persistent; stipules (1–)1.5–2.5 cm long, brown strigose to strigillose to appressed-puberulous, subpersistent. *Figs* cauliflorous clustered on short (up to 2 cm long) woody tubercles or up to 2 cm long branched branchlets with (very) short internodes, on the older wood; peduncle 0.8–1.2 cm long; basal bracts 3, (sub)verticillate (or scattered), 1–1.5 mm long; receptacle subglobose to obovoid to subpyriform to depressed-globose, 1–2.5 cm diam. when dry, often 1–2 mm long stipitate, brown puberulous, conspicuously lenticellate, 5–15-ribbed, without lateral bracts, colour at maturity unknown, apex flat to ± concave, ostiole 3–5 mm diam., ± depressed, surrounded by 5 very short apical bracts; internal hairs sparse, brown.

Distribution — *Malesia*: Borneo (Sarawak).

Habitat — Alluvial riverbanks, at low altitudes.

Notes — 1. One of the labels indicates that the plant is a rheophytic shrub. On all specimens traces of silt are present.

2. This species resembles both *F. obpyramidata* (Malay Peninsula) and *F. hahliana* (New Guinea). It can readily be distinguished from the former by the relatively narrow leaves and (sub)persistent stipules and from the latter by the (sub)entire lamina and the hairy and conspicuously lenticellate fig receptacles.

65. Ficus linearifolia Elmer

Ficus linearifolia Elmer, Leafl. Philipp. Bot. 1 (1907) 257; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 306. — *Ficus botryocarpa* Miq. var. *linearifolia* (Elmer) Corner, Gard. Bull. Singapore 18 (1960) 44.

Ficus merrillii Elmer, Leafl. Philipp. Bot. 1 (1908) 282; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 57; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 311.

Ficus cervina Elmer, Leafl. Philipp. Bot. 2 (1908) 543; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 49; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 306.

Ficus olivacea Elmer, Leafl. Philipp. Bot. 9 (1937) 3437; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 312.

Tree up to 12 m tall. *Leafy twigs* 2–4 mm thick, densely whitish to brownish appressed-puberulous to dark to pale brown hirtellous, without nodal waxy glands; internodes hollow or solid; periderm persistent. *Leaves* (sub)distichous, sometimes subopposite; lamina oblong to elliptic to (sub)obovate, (4–)7–23 by (2–)2.5–10.5 cm, usually ± asymmetric, subcoriaceous, apex acuminate, base cuneate (to obtuse), margin subentire to denticulate; upper surface (sub)glabrous, smooth, lower surface sparsely to rather densely brown(ish) to whitish strigillose or (partly) puberulous to subhirtellous on the (main) veins, smooth, cystoliths above and beneath; lateral veins 4–8 pairs, the pairs in the middle part of the lamina often branched, tertiary venation (± loosely) scalariform; waxy glands often absent, sometimes present in slit-shaped extensions of the axils of 1 or 2 lateral veins in the middle part of the lamina; petiole 0.5–1.5 cm long, ± densely whitish to brownish appressed-puberulous to strigillose, the epidermis mostly flaking off; stipules 0.6–1.8 cm long, brown(ish) to whitish strigillose to subsericeous, caducous. *Figs* cauliflorous to flagelliflorous on up to 1 m long slender branches on

the trunk or on stolons; peduncle 0.4–2.2 cm long; basal bracts 3, verticillate, 1.5–2.5 mm long; receptacle subglobose, 0.5–1 cm diam. when dry, densely (dark) brown appressed- or ± patent-puberulous, non-stipitate (or up to 0.2 cm long stipitate), not or ± faintly ribbed, without (or with 1 or 2) lateral bracts, colour at maturity unknown, apex ± convex to flat (or ± concave), ostiole 2–3 mm diam., mostly ± prominent, surrounded by 5 erect apical bracts; internal hairs abundant to rather sparse, brown(ish), long(er than the flowers).

Distribution — *Malesia*: Philippines (Luzon, Negros, Leyte).

Habitat —Forest, at altitudes up to 900 m.

Notes — 1. This species shows clear affinities to *F. cuneata* from which it differs in the dense (dark) brown indumentum of the fig receptacles, the usually brown(ish) indumentum of the leafy twigs, sometimes patent on the leafy twigs and on the main veins of the lamina beneath, and mostly also by larger laminas.

2. This species has a form with lanceolate and smaller leaves (on Luzon and including the type of *F. linearifolia*) such as in the related *F. cuneata*.

66. Ficus manuselensis C.C. Berg

Ficus manuselensis C.C. Berg, Blumea 49 (2004) 174.

Tree, c. 10 m tall. *Leafy twigs* 2–3 mm thick, sparsely dark brown strigillose, without nodal waxy glands; internodes hollow; periderm persistent; nodes prominent by scars of the leaves and lenticels. *Leaves* spirally arranged to subdistichous; lamina oblong, 5–23 by 2–8.5 cm, slightly asymmetric, chartaceous, apex acuminate, base subcuneate to subtruncate, margin coarsely crenate-dentate; upper surface glabrous, smooth, lower surface sparsely dark brown to whitish strigillose, initially also whitish villose on the main veins, smooth, cystoliths only beneath; lateral veins 7–10 pairs, unbranched, tertiary venation (sub)scalariform; waxy glands small, in the axils of lateral veins in the middle part of the lamina, or absent; petiole (1–)1.5–4.5 cm long, sparsely dark brown to whitish strigillose, the epidermis persistent; stipules 0.8–1.2 cm long, whitish to brownish strigillose, caducous. *Figs* sometimes axillary, solitary, mostly cauliflorous on up to 40 cm long slender branchlets on the older wood; figs sessile; basal bracts 3, verticillate, 2–2.5 mm long; receptacle subglobose to depressed-globose, c. 3 cm diam. when dry, up to 0.8 cm long stipitate, glabrous, without lateral bracts, colour at maturity unknown, apex concave to flat, ostiole c. 5 mm diam.; internal hairs absent.

Distribution — *Malesia*: Moluccas (Ceram).

Habitat — Mossy forest on limestone, on rocky slope, c. 1200 m.

Note — This species is probably closely related to the non-cauliflorous *F. ternatana* from which it differs in the glabrous upper surface of the lamina and sessile fig, but with a stipitate receptacle, being larger, c. 3 cm in diameter.

67. Ficus megaleia Corner

Ficus megaleia Corner, Gard. Bull. Singapore 18 (1960) 57; 21 (1965) 91; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 286.

Ficus megaleia Corner var. *multinervia* Corner, Gard. Bull. Singapore 19 (1962) 400.

Ficus megaleia Corner var. *subuncinata* Corner, Gard. Bull. Singapore 19 (1962) 400.

Shrub or tree up to 7 m tall. *Leafy twigs* 3–7 mm thick, brownish hirsute to hirtellous, the longer stiff hairs intermixed with sparse shorter and softer white hairs, with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* distichous; lamina oblong, 40–100 by 15–35 cm, asymmetric, chartaceous, apex acuminate, base cordate, the larger lobe often covering the petiole, margin denticulate; upper surface strigose to subhispid, ± scabrous, lower surface brownish hirsute to hirtellous on the veins, the longer stiff hairs intermixed with shorter and softer white hairs, smooth, cystoliths only beneath; lateral veins 8–20(–24) pairs, some or most of them branched or furcate far from the margin, tertiary venation scalariform, partly running perpendicular to the midrib; waxy glands in the axils of lateral veins in the middle part of the lamina and in furcations of lateral veins; petiole 12.5 cm long, brownish hirsute to hirtellous, the epidermis persistent; stipules 3–7 cm long, whitish puberulous and brown strigose to subsericeous, caducous. *Figs* flagelliflorous on stolons with up to 4 cm long internodes; peduncle 0.3–1.3 cm long; basal bracts 3, ± scattered, 3–6 mm long; receptacle subpyriform, 1–3 cm diam. when dry, 0.4–0.8 cm long stipitate, brown hirtellous, with numerous lateral bracts, purplish at maturity, apex flat to slightly concave; ostiole c. 10 mm diam., surrounded by several, erect to incurved apical bracts; internal hairs absent. — **Fig. 78f.**

Distribution — *Malesia*: Borneo.

Habitat — Forest, at altitudes up to 1600 m.

68. Ficus morobensis C.C. Berg

Ficus morobensis C.C. Berg, Blumea 49 (2004) 177.

Tree, c. 12 m tall. *Leafy twigs* 8–15 mm thick, brownish hirtellous to subhirsute, with (large, sometimes almost band-shaped) nodal waxy glands; internodes hollow; some large lenticels just below the scars of the stipules; periderm flaking off. *Leaves* spirally arranged or subopposite; lamina oblong to subobovate to subrhombic, 24–38 by 11–17 cm, symmetric or slightly asymmetric, chartaceous, apex acuminate, base cordate to subcuneate, margin denticulate towards the apex dentate; upper surface hirtellous to hispidulous, scabrous, lower surface (rather) densely brownish hirtellous on the veins, smooth, cystoliths only beneath; lateral veins 7–9 pairs, often branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of lateral veins in the middle part of the lamina and in furcations of lateral veins; petiole 3.5–7 cm long, hirtellous to subhirsute, the epidermis flaking off; stipules 3.5–4 cm long, brownish to whitish strig(ill)ose to subsericeous, subpersistent. *Figs* cauliflorous "in large clumps (up to 30 cm diam.) or small clusters along the stem"; peduncle 3–6 cm long; basal bracts 3, (sub)verticillate, 2–3 mm long; receptacle subobovoid to pyriform, 2–2.5 cm diam. when dry, up to 4.5 cm diam. when fresh, up to c. 1 cm long stipitate, brown puberulous, without lateral bracts, ribbed, at maturity reddish brown with pale spots, apex ± convex to flat, ostiole 7–8 mm diam., including 5 or 6 hardly distinct short apical bracts; internal hairs bristles rather abundant, brownish.

Distribution — *Malesia*: New Guinea (Milne Bay and Morobe Provinces).

Habitat — Forest and secondary growth, at altitudes between 700 and 1600 m.

Note — This species is probably closely related to *F. pachyrrhachis*, from which it differs in the convex to flat apex and the stipitate base of the fig receptacle, the short basal bracts, and possibly also in the position of the figs on the tree, according to label data, on bunches of short branchlets rather than on up to 40 cm long elongate leafless branchlets.

69. Ficus multistipularis Merr.

Ficus multistipularis Merr., Philipp. J. Sci. 18 (1921) 67; Enum. Philipp. Flow. Pl. 2 (1923) 58; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 325; Corner, Gard. Bull. Singapore 21 (1965) 89.
Ficus palmaecovellia Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 326.

Sparingly branched shrub. *Leafy twigs* 4–8 mm thick, dark brown strigose, with nodal glands; internodes hollow; periderm flaking off. *Leaves* (sub)opposite or spirally arranged, ± tufted; lamina subobovate to oblanceolate, 12–37 by 4–18 cm, slightly asymmetric, chartaceous to subcoriaceous, apex acuminate, base subcordate-auriculate, margin dent(icul)ate; upper surface sparsely strigillose, glabrescent, smooth, lower surface brown to whitish strigose to strigillose, smooth, cystoliths only beneath; lateral veins 7–10 pairs, some of them furcate far from the margin, tertiary venation loosely scalariform; waxy glands in the axils of some of the lateral veins in the middle part of the lamina or absent; petiole 1–3(–7) cm long, brown strigose, the epidermis persistent; stipules 1.5–4 cm long, brown strigose, (sub)persistent. *Figs* axillary, in pairs, ± concealed by the stipules, subsessile or with a peduncle up to 0.2 cm long; basal bracts 3, subverticillate, 2.5–4 mm long; receptacle subglobose, 1.5–2 cm diam. when dry, brown strigillose, without lateral bracts, slightly ribbed, colour at maturity unknown, apex ± convex, ostiole c. 4 mm diam., umbonate; internal hairs absent. — **Fig. 85; Map 10.**

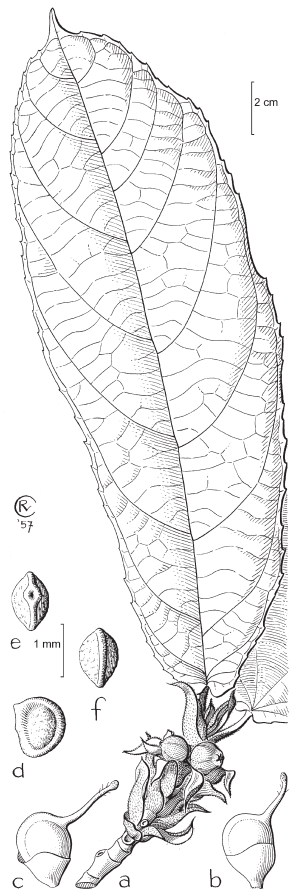


Fig. 85. *Ficus multistipularis* Merr. a. Leafy twig with figs; b, c. long-styled flowers; d–f. fruits (all: *Sulit 14362*).

Distribution — *Malesia*: Philippines (Luzon, Cataduanes, Samar).

Habitat — Forest, often along streams, at low altitudes.

Note — This species is probably closely related to *F. carpentaria*, from which it differs in the longer stipules (more or less concealing the figs), the ± tufted and often opposite leaves, the almost symmetric lamina with a distinctly dent(icul)ate margin, and appressed hairs on the various parts. It might prove to merit only a subspecific status.

70. **Ficus nana** Corner

Ficus nana Corner, Blumea 22 (1975) 306, t. 3.

Treelet up to 1 m tall. *Leafy twigs* 8–10 mm thick, brown hirsute, without nodal glands; internodes hollow; periderm persistent. *Leaves* spirally arranged, ± tufted; lamina lanceolate, c. 40 by 10 cm, symmetric, chartaceous to subcoriaceous, apex acuminate, base subcordate, margin ciliate and dentate; upper surface brownish pilose to hirtellous, ± scabrous, lower surface brown hirsute to hirtellous on the veins, ± scabrous, cystoliths only beneath; lateral veins c. 10 pairs, none of them branched or furcate far from the margin, tertiary venation loosely scalariform to subreticulate; waxy glands absent (?); petiole c. 1 cm long, brown hirsute, the epidermis persistent; stipules 4–6 cm long, glabrous, (sub)persistent. *Figs* axillary, solitary, subsessile; basal bracts 3, verticillate, 7–9 mm long; receptacle subglobose to ovoid, c. 1.3 cm diam. when dry, glabrous, with up to 5 mm long lateral bracts in the upper part, colour at maturity unknown, apex convex, ostiole c. 0.6 cm diam., surrounded by 2 or 3 rows of apical bracts; internal hairs absent.

Distribution — *Malesia*: New Guinea.

Habitat — Lowland forest; rare.

71. **Ficus nota** (Blanco) Merr.

Ficus nota (Blanco) Merr., Publ. Gov. Lab. Philipp. 17 (1904) 10; 27 (1906) 79; Philipp. J. Sci., 1, Suppl. (1906) 44; Elmer, Leafl. Philipp. Bot. 1 (1906) 58, 198; 1 (1907) 257; Merr., Philipp. J. Sci., Bot. 3 (1908) 403; 5 (1910) 343; Elmer, Leafl. Philipp. Bot. 4 (1911) 1262; Merr., Fl. Manila (1912) 174; Baker, Philipp. J. Sci., Bot. 8 (1913) 63; Merr., Sp. Blancoan. (1918) 125; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 222, f. 21, 22; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 59; West, Philipp. J. Sci. 52 (1933) t. 5, f. 1; Elmer, Leafl. Philipp. Bot. 9 (1937) 3448; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 304; Fox, Philipp. J. Sci. 81 (1952) 189, p. 2, f. 2; Corner, Gard. Bull. Singapore 21 (1965) 88; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 291. — *Ficus aspera nota* Blanco, Fl. Filip. (1837) 677; ed. 2 (1845) 471.

Ficus scabra Blanco, Fl. Filip., ed. 2 (1845) 471; Náves in Blanco, Fl. Filip., ed. 3, 3 (1879) 81.

Ficus merrittii auct. non Merr.: Elmer, Leafl. Philipp. Bot. 4 (1912) 1376.

Tree up to 13 m tall. *Leafy twigs* 3–6 mm thick, (rather) densely white puberulous to hirtellous (to strigillose), usually with (small) nodal waxy glands; internodes hollow; periderm flaking off (often starting below the leaves). *Leaves* spirally arranged, (sub)opposite or on lateral branches (sub)distichous; lamina oblong to elliptic to (sub)obovate, 15–35 by 7.5–21 cm, ± asymmetric, chartaceous to subcoriaceous, apex acuminate, base cordate to subcordate at one side, cordate to rounded at the other side, margin ± irregularly crenate-dentate to -denticulate; upper surface sparsely to rather densely puberulous to strigillose, glabrescent, smooth (or scabridulous), lower surface sparsely to rather densely white puberulous to hirtellous, smooth or scabridulous, cystoliths only beneath; lateral veins 4–9 pairs, some of them branched or furcate far from the margin, lower lateral veins often not distinctly loop-connected, tertiary venation ± loosely scalariform; waxy glands small, in the axils of lateral veins in the middle part of the lamina or also in furcations of lateral veins; petiole 1–6(–8) cm long, white puberulous, white to hirtellous, the epidermis flaking off; stipules 1–3 cm long, brown(ish) strigillose to subsericeous, caducous. *Figs* cauliflorous on stout branched up

to 60 cm long branchlets, on the main branches and the trunk; peduncle 0.5–2.7(–6?) cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle pyriform to obovoid to depressed-globose, 1–2.5 cm diam. when dry, 2.5–4.5 cm diam. when fresh, non-stipitate, sparsely white puberulous or (sub)glabrous, with conspicuous lenticels, without or with 1 or 2 lateral bracts, often finely ribbed, at maturity brown (?), apex convex to flat; ostiole 4–9 mm diam.; internal hairs sparse. — **Map 11.**

Distribution — *Malesia*: Borneo (northern), Philippines.

Habitat — Lowland and montane forest, often along streams, at altitudes up to 1300 m.

Notes — 1. This species is very closely related to *F. satterthwaitei* from which it differs in the cordate to subcordate base (at both sides) and generally denser indumentum on various parts.

2. Moreover, this species shows clear affinities to *F. calopilina*.

3. The occasional lateral bracts are apparently dislocated apical bracts.

72. **Ficus novahibernica** Corner

Ficus novahibernica Corner, Blumea 18 (1970) 407, f. 9, 10.

Tree up to 8 m tall. *Leafy twigs* 4–8 mm thick, glabrous, with nodal waxy glands; internodes hollow; periderm flaking off. *Leaves* spirally arranged; lamina elliptic to subovate, 18–30 by 13–20 cm, (almost) symmetric, chartaceous to subcoriaceous,

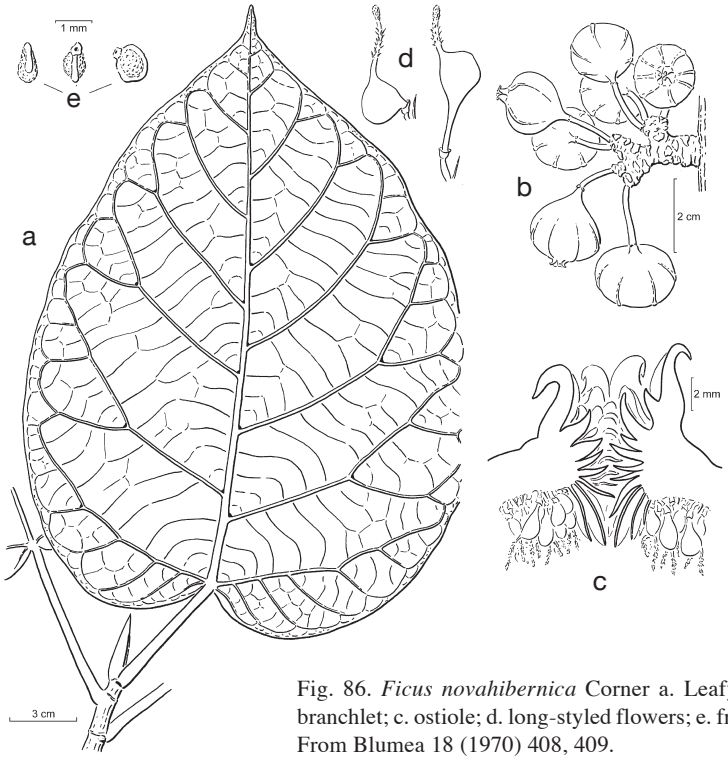


Fig. 86. *Ficus novahibernica* Corner a. Leafy twig; b. fig-bearing branchlet; c. ostiole; d. long-styled flowers; e. fruits (all: *NGF 46121*). From Blumea 18 (1970) 408, 409.

apex acuminate, base cordate, margin entire; upper surface glabrous, smooth, lower surface (sub)glabrous, smooth, cystoliths only beneath; lateral veins 7–10 pairs, often branched or furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of some lateral veins in the middle part of the lamina and in furcations of lateral veins; petiole 5–14 cm long, (sub)glabrous, the epidermis flaking off; stipules 2.2–3 cm long, glabrous, caducous. *Figs* cauliflorous on stout branched up to c. 3 cm long branchlets, with short internodes and prominent scars and terminally subpersistent stipules, on the lower part of the trunk (?); peduncle 0.7–1.7 cm long; basal bracts 3, verticillate, 2–3 mm long, caducous; receptacle subpyriform to subglobose, 1.5–2 cm diam. when dry, up to 0.5 cm long stipitate, (sub)glabrous, without lateral bracts, (faintly) ribbed, colour at maturity unknown, apex slightly convex to flat, ostiole c. 5 mm diam., including 5 incurved stiff apical bracts, prominent; internal hairs sparse, pale brown. — **Fig. 86.**

Distribution — *Malesia*: New Guinea (New Ireland).

Habitat — Lowland riverside forest.

Note — This species is closely related to *F. porrecta*, from which it differs in the glabrous plant parts and the caducous stipules.

73. Ficus obpyramidata King

Ficus obpyramidata King, Sp. Ficus 2 (1888) 116, t. 153; Fl. Brit. India 5 (1888) 525; Ridl., Fl. Malay Penins. 3 (1924) 343; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 40, f. 22, 23; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1011; Corner, Wayside Trees (1940) 685, f. 251; Gard. Bull. Singapore 21 (1965) 88; Kochummen, Tree Fl. Malaya 3 (1978) 152; Tree Fl. Sabah & Sarawak 3 (2000) 291.

Tree up 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 asymmetric, chartaceous, apex acuminate, base cuneate to subcordate, margin denticulate to subentire; upper surface puberulous to subhispidulous, scabridulous, lower surface brown hirtellous to strigose to whitish puberulous on the veins, smooth, cystoliths only beneath; lateral veins (6–)8–13 pairs, some of them branched or furcate far 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* cauliflorous on up to c. 15 cm long branched branchlets with (very) short internodes, on the trunk; peduncle 1–3.5 cm long; basal bracts 3, verticillate, 2–3 mm long; receptacle obovoid to pyriform to depressed-globose, (2–)2.5–3 cm diam. when dry, 3.5–4.5 cm diam. when fresh, (sub)glabrous, ribbed, without lateral bracts, at maturity yellow to brownish, apex concave, ostiole 6–8 mm diam., depressed; internal hairs rather sparse, whitish. — **Map 11.**

Distribution — Lower Myanmar, Thailand, and Malesia; in *Malesia*: Malay Peninsula.

Habitat — Mostly along streams, common in secondary growth, at low altitudes.

74. **Ficus pachyrrhachis** Lauterb. & K. Schum.

Ficus pachyrrhachis Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 282; Corner, Gard. Bull. Singapore 18 (1960) 47.

Ficus grandis King, Sp. Ficus 2 (1888) 170, t. 214, non Miq. 1867; Diels, Bot. Jahrb. Syst. 67 (1935) 214 (p.p. typo; alt. p. = *F. calopilina* Diels); Corner, Gard. Bull. Singapore 21 (1965) 87.

Ficus hypoglauca Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 285 (p.p. infloresc.; folia = Lauraceae); Diels, Bot. Jahrb. Syst. 67 (1935) 214; Corner, Gard. Bull. Singapore 21 (1965) 87, 98. — Type: *Lauterbach 2461* (B), Papua New Guinea, Ramu River, 3 July 1896, consists of figs and fig-bearing branches of *F. pachyrrhachis* and Lauraceous leaves; Diels and Corner (1965: 87) have apparently selected the *Ficus* element as lectotype as *F. hypoglauca* was included in the synonymy of *F. pachyrrhachis*; the choice is confirmed here.

Ficus pachythyrsa Diels, Bot. Jahrb. Syst. 67 (1935) 215.

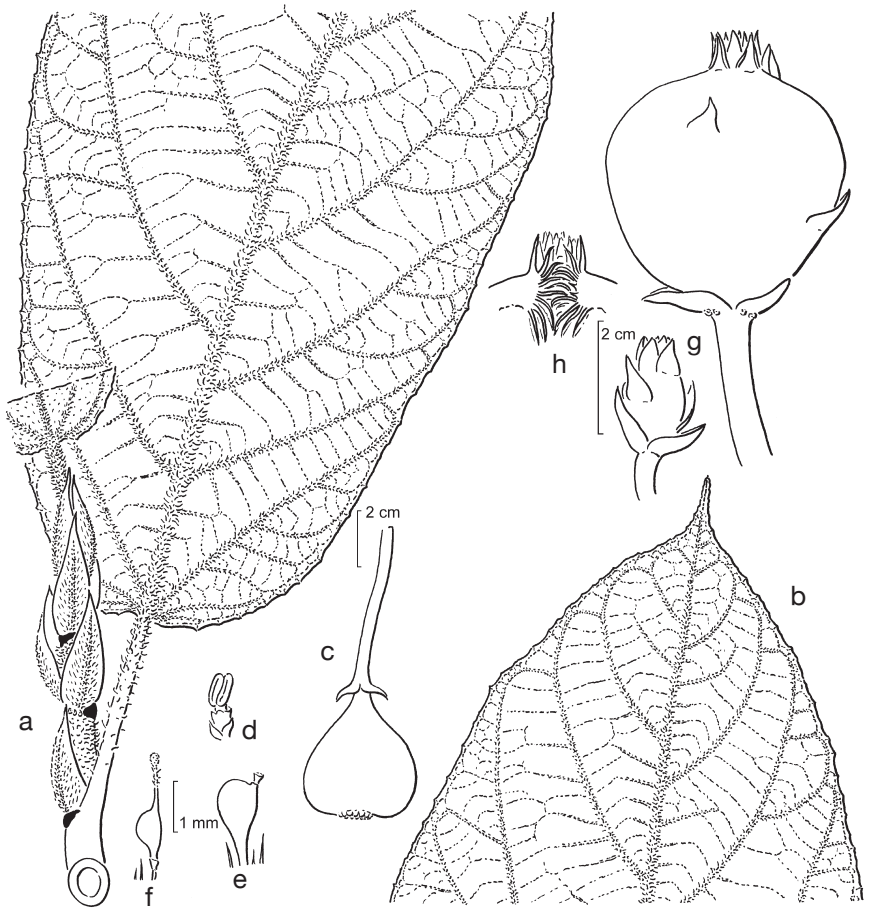


Fig. 87. a–f: *Ficus pachyrrhachis* Lauterb. & K. Schum. a. Leafy twig; b. apex of lamina; c. fig; d. staminate flower; e. short-styled flower; f. long-styled flower. — g, h: *Ficus porrecta* (Corner) C.C. Berg. g. Figs; h. ostiole (a: *Hoogland 9140*; b–f: collections used unknown; g, h: *BW 682*). From Philos. Trans., Ser. B, 281(1978) 389.

Tree up to 20 m tall. *Leafy twigs* 5–12 mm thick, white to brownish puberulous, with nodal waxy glands; internodes hollow; periderm (sooner or later) flaking off. *Leaves* spirally arranged (or subopposite); lamina (broadly) elliptic to oblong, 20–45 by 14–32 cm, symmetric, chartaceous, apex (short-)acuminate, base cordate to truncate to rounded, margin denticulate towards the apex dentate; upper surface hirtellous to hispidulous, ± scabrous, lower surface (rather) densely whitish hirtellous on the veins, smooth, cystoliths only beneath; lateral veins 8–10 pairs, all (or most) of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands in extensions of the axils of lateral veins in the middle part of the lamina and in the furcations of lateral veins; petiole 2–6 cm long, hirtellous, the epidermis (sooner or later) flaking off; stipules 1.5–4.5 cm long, brownish to whitish hirtellous to subsericeous, caducous (or subpersistent). *Figs* cauliflorous, sometimes ramiflorous (just below the leaves), mostly on up to 45 cm long stout mostly unbranched branchlets, on the trunk and the main (and lesser?) branches, the nodes prominent, the distal nodes with subpersistent stipules; peduncle 1–6 cm long; basal bracts 3, verticillate, 6–10 mm long; receptacle turbinate to pyriform, when dry 2–3 cm diam., whitish to brownish puberulous, without lateral bracts, ribbed, at maturity orange to reddish or brownish, apex ± concave and ostiole depressed, ostiole 5–8 mm diam., surrounded by 5 incurved apical bracts; internal hairs sparse to abundant, white to brownish. — **Fig. 87a–f.**

Distribution — *Malesia*: New Guinea.

Habitat — Lowland and montane forest, at altitudes up to 1500 m.

75. **Ficus papuana** Corner

Ficus papuana Corner, Gard. Bull. Singapore 18 (1960) 49; 21 (1965) 87.
Ficus neobritannica Corner, Gard. Bull. Singapore 18 (1961) 91, f. 5.
Ficus setistyla auct. non Warb.: Summerh., J. Arnold Arbor. 22 (1941) 99.

Tree up to 13 m tall. *Leafy twigs* 4–8 mm thick, dark to pale brown subhirsute hirtellous, the longer stiff hairs intermixed with (rather sparse) shorter and softer white hairs, with nodal waxy glands; internodes hollow; periderm (always?) persistent. *Leaves* distichous or subopposite; lamina oblong to elliptic to subobovate, 12–40 by 7–25 cm, strongly asymmetric to almost symmetric, chartaceous, apex acuminate, base subcordate to deeply cordate and at the broad side the lobe ± covering the petiole, margin dentate to denticulate; upper surface strigillose to (sub)hispidulous, ± scabrous, lower surface densely whitish to brownish (sub)hirsute on the main veins (often with ± retrorse hairs) to whitish hirtellous on the veins, smooth smaller, cystoliths only beneath; lateral veins 8–15 pairs, most of them branched or furcate far from the margin, 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; petiole 1–3 cm long, white to dark brown (sub)hirsute, the epidermis (always?) persistent; stipules 1–3 cm long, white to brown hirtellous to subsericeous, caducous. *Figs* cauliflorous or sometimes axillary, mostly in clusters on stout up to 30 cm long branchlets, on the trunk and the main branches; peduncle 0.5–2(–3) cm long; basal bracts 3, verticillate, 2–6 mm long; receptacle subglobose to pyriform, 2–4 cm diam. when dry, 3–4.5 cm diam. when fresh, sparsely whitish puberulous, without lateral bracts, colour at maturity unknown, apex ± concave

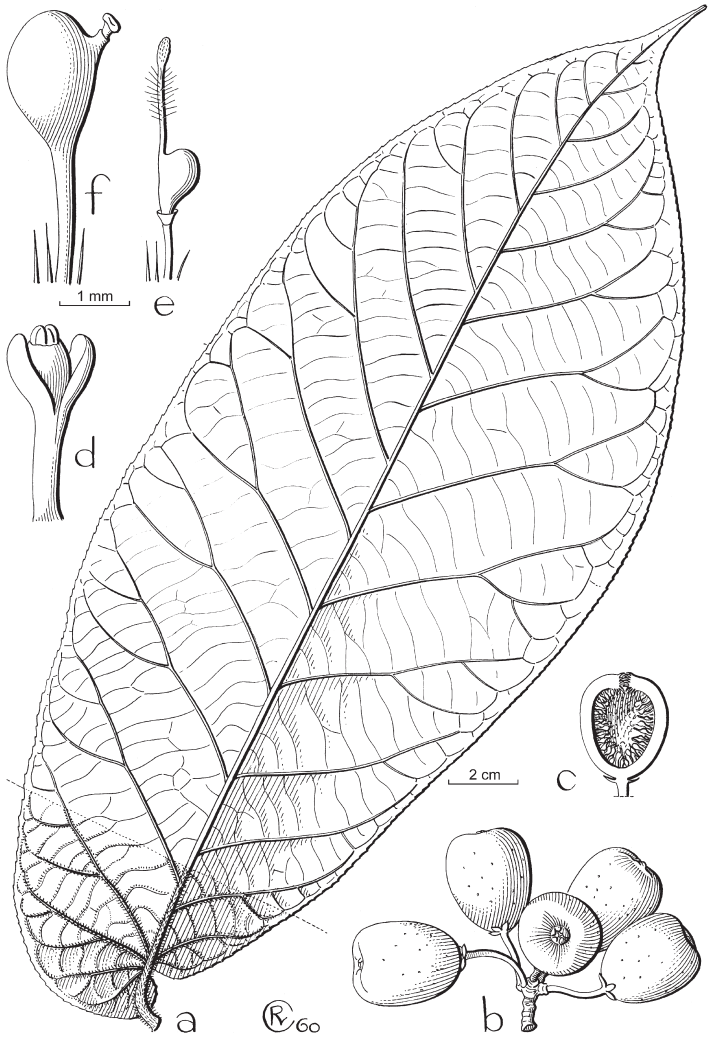


Fig. 88. *Ficus papuana* Corner. a. Leaf; b. fig-bearing branchlet; c. fig; d. staminate flower; e. long-styled flower; f. short-styled flower (a–d, f: *Carr 11640*; e: *Brass 7740*).

to convex, ostiole 3–4 mm diam., surrounded by 5 or 6 erect apical bracts; internal hairs sparse to abundant, white to brownish. — **Fig. 88.**

Distribution — Malesia and the Solomon Islands (New Georgia); in *Malesia*: New Guinea (incl. New Britain).

Habitat — Forest and secondary growth, often along streams, or in swamp-woodland, at altitudes up to 1700 m.

Note — This species is very close to *F. calopilina*. It might even prove to be not more than just a form of *F. calopilina*. The figs matches those of *F. calopilina* and the almost symmetric (and usually smaller) leaves cannot be distinguished from those

of *F. calopilina*. The epidermis of the petioles and the periderm of the leafy twigs are (probably not) exfoliating. These features, the often strongly asymmetric leaves, and the relatively short petioles may help to distinguish *F. papuana* from the variable *F. calopilina*.

76. Ficus parvibracteata Corner

Ficus parvibracteata Corner, Gard. Bull. Singapore 18 (1960) 45; 21 (1965) 86.

Tree up to 10 m tall. *Leafy twigs* 2–3 mm thick, brown to whitish strigillose, without nodal glands; internodes solid; periderm persistent. *Leaves* in lax spirals to subdistichous; lamina oblong to subobovate to oblanceolate, 5–20 by 1.5–7 cm, symmetric or slightly asymmetric, chartaceous, apex acuminate to subcaudate, base cuneate to rounded, margin denticulate towards the apex, also the acumen denticulate; upper surface rather densely whitish to brownish strigillose, ± scabrous, lower surface brownish to whitish strigillose to appressed-puberulous, ± scabridulous, cystoliths above and beneath; lateral veins 6–10, none of them branched or furcate far from the margin, tertiary venation scalariform; 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; waxy glands absent or sometimes also minute ones in the axils of the basal lateral veins; petiole 0.8–2.5(–4.5) cm long, brown to whitish strigillose, the epidermis persistent; stipules 0.8–1.5 cm long, brown to whitish strigillose, subpersistent (or caducous). *Figs* cauliflorous on branched up to 30 cm long branchlets with 0.3–0.8 cm long (sub)persistent stipules, on the older wood; peduncle 0.1–0.4 cm long; basal bracts 3, verticillate, 2–2.5 mm long; receptacle subglobose, 0.5–1.2 cm diam. when dry, non-stipitate, brownish appressed-puberulous, faintly ribbed, with a few lateral bracts, mainly in the upper part of the receptacle, passing into apical bracts, colour at maturity unknown, apex ± convex, ostiole 2–2.5 mm diam., surrounded with short apical bracts; internal hairs abundant, brownish, long(er than the flowers?).

Distribution — *Malesia*: Celebes.

Habitat — Forest, at altitudes between 1200 and 1500 m.

77. Ficus pleyteana Corner

Ficus pleyteana Corner, Gard. Bull. Singapore 18 (1960) 63; 21 (1965) 94.

Tree up to 10 m tall. *Leafy twigs* 1.5–2.5 mm thick, brown(ish) to whitish appressed-puberulous to strigillose, without nodal waxy glands; internodes hollow; periderm persistent. *Leaves* (sub)distichous; lamina (ob)lanceolate to linear, 5–14 by 0.7–2 cm, slightly asymmetric, chartaceous, apex acuminate to subcaudate, base cuneate to obtuse, margin faintly denticulate to subentire; upper surface sparsely strigillose to subglabrous, smooth, lower surface sparsely to rather densely brown(ish) or whitish strigillose on the veins, smooth, cystoliths only beneath; lateral veins 8–10 pairs, none of them branched or furcate far from the margin, tertiary venation loosely scalariform to subreticulate; waxy glands absent; petiole 0.3–0.5 cm long, brown(ish) strigillose, the epidermis persistent; stipules 1–1.6 cm long, (sparsely) brownish to whitish strigillose to subsericeous, subpersistent. *Figs* flagelliflorous on (at least) up to 90 cm long

Fig. 89. *Ficus pleyteana* Corner. a. Leafy twig with fig; b. fig-bearing branchlets; c. fig; d. ostiole; e, f. long-styled flowers; g. fruits (all: *Pleyte 378*).

stolons, sometimes also axillary and solitary; peduncle 0.2–0.4 cm long; basal bracts 3, verticillate, 3–5 mm long; receptacle subglobose to ellipsoid, 0.7–1 cm diam. when dry, brown strigillose, non-stipitate, pronouncedly 5-ribbed, without lateral bracts, colour at maturity unknown, apex flat to slightly convex, ostiole 2–3 mm diam., surrounded by 5 ± erect apical bracts; internal hairs absent or sparse. — **Fig. 89.**

Distribution — *Malesia*: Moluccas (Halmahera).

Habitat — Forest, along stream, at 600 m.

Note — This species is distinct from related ones, *F. parvibracteata* and *F. cuneata*, in the relatively long stipules, the relatively long basal bracts, the short petiole, and the pronouncedly ribbed fig receptacle.

78. Ficus porrecta (Corner) C.C. Berg

Ficus porrecta (Corner) C.C. Berg, Blumea 49 (2004) 177. — *Ficus pachyrrhachis* K. Schum. & Lauterb. var. *porrecta* Corner, Gard. Bull. Singapore 18 (1960) 47.

Treelet up to 5 m tall. *Leafy twigs* 8–12 mm thick, whitish strigillose, with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* spirally arranged; lamina elliptic to subovate, 30–42 by 16–21 cm, (almost) symmetric, chartaceous, apex subacuminate, base cordate, margin denticulate; upper surface strigillose to hispidulous, scabrous, lower surface (rather) densely whitish hirtellous to puberulous and on the main veins whitish to brownish strigillose to strigose, the longer hairs intermixed with shorter and softer white hairs, smooth, cystoliths only beneath; lateral veins 9–12 pairs, often branched or furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of some lateral veins in the middle part of the lamina and in furcations of lateral veins; petiole 7.5–13 cm long, strigillose, the epidermis persistent; stipules 3.5–4 cm long, whitish strig(ill)ose to subsericeous, subpersistent. *Figs* cauliflorous on stout up to c. 30 cm long branchlets, with short internodes and prominent scars, and terminally with a cluster of short branchlets, on the base of the trunk (?); peduncle c. 1 cm long; basal bracts 3, verticillate, 5–6 mm long, lanceolate, stiff; receptacle turbinate to pyriform, when dry c. 2 cm diam., (sub)glabrous, with few narrow and stiff lateral bracts, faintly ribbed, colour at maturity unknown, apex slightly convex to flat, ostiole c. 4 mm diam., surrounded by a rosette of stiff apical bracts, pointing upwards; internal hairs abundant, pale brown. — **Fig. 87g, h.**

Distribution — *Malesia*: New Guinea.

Habitat — Lowland forest.

Notes — 1. The single specimen described as var. *porrecta* of *F. pachyrrhachis* clearly differs from material that certainly belongs to *F. pachyrrhachis*, such as in the persistent periderm of the leaf twigs and the persistent epidermis of the petioles, in the long petioles, in the construction of apex of the fig, and the texture of the basal, lateral and apical bracts (similar to those of *F. uncinata*). The nature of these differences is such that maintaining the variety cannot be justified.

2. This species is probably more closely related to *F. praestans* than to *F. pachyrrhachis*.

79. Ficus praestans Corner

Ficus praestans Corner, Gard. Bull. Singapore 18 (1960) 45; 21 (1965) 86.

Tree up to 15 m tall. *Leafy twigs* 6–12 cm thick, brown hirsute to substrigose, the longer hairs intermixed with shorter and softer white hairs, without waxy glands; internodes hollow; periderm flaking off. *Leaves* spirally arranged; lamina elliptic to obovate, 17–30(–50) by 9–20(–30) cm, often slightly asymmetric, chartaceous, apex acuminate, base (sub)cordate, margin dentate to denticulate (towards the base); upper surface

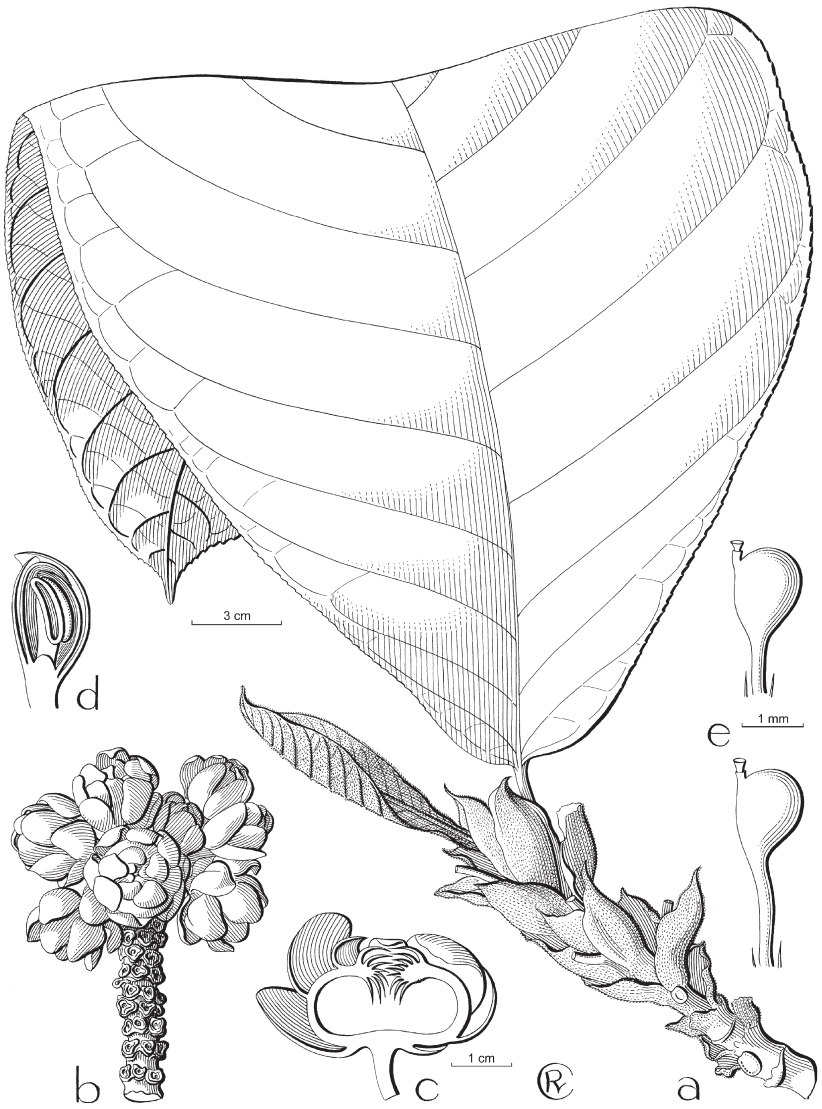


Fig. 90. *Ficus praestans* Corner. a. Leafy twig; b. fig-bearing branchlet; c. fig; d. staminate flower; e. short-styled flowers (all: *NGF 3407*).

brownish strigillose and on the main veins to hirtellous, ± scabrous, lower surface brown hirtellous to subhirsute on the main veins, the longer hairs intermixed with shorter and softer white hairs, ± scabrous, cystoliths only beneath; lateral veins 7–12 pairs, often branched or furcate far from the margin, tertiary venation ± loosely scalariform; waxy glands in the axils of the lateral veins in the middle of the lamina, sometimes also in the axils of the basal lateral veins, often additional glands in the axils of branches or furcations of lateral veins; petiole 2–15 cm long, brown (sub)hirsute, the longer hairs

intermixed with shorter and softer white hairs, the epidermis flaking off; stipules 2–6 cm long, white appressed-puberulous to brown hirtellous to substrigose on the keel, (sub)persistent. *Figs* cauliflorous on stout unbranched or sparingly branched up to 40 cm long branchlets with short internodes and prominent scars of the fig peduncles and 1–2 cm long stipules, on the older wood, down to the base of the trunk; peduncle 0.4–4 cm long; basal bracts 1 or 2, non-verticillate, 2–5 cm long bracts on the peduncle, passing into the lateral bracts; receptacle subglobose to depressed-globose, 2.5–3 cm diam. when dry, sparsely hirtellous to glabrous, with numerous elliptic, up to 2 cm long, thinly coriaceous lateral bracts with ± conspicuous subflabellate venation, yellowish at maturity, apex ± convex, ostiole 3–4 mm diam., surrounded by small apical bracts; internal hairs absent or sparse and brownish. — **Fig. 90.**

Distribution — *Malesia*: New Guinea (New Britain).

Habitat — Lowland forest.

Note — This species shows in many features similarities to *F. minahassae* and *F. pungens*.

80. Ficus remifolia Corner ex C.C. Berg

Ficus remifolia Corner ex C.C. Berg, Blumea 49 (2004) 178.

Shrub (?). *Leafy twigs* 5–9 mm thick, (sub)glabrous, with nodal glands; internodes hollow; periderm persistent. *Leaves* spirally arranged, ± tufted; lamina elliptic, 18–28 by 7–13 cm, (almost) symmetric, chartaceous to subcoriaceous, apex acuminate, base (equilateral to ± inequilateral), cuneate to rounded, margin crenate-dentate to entire; upper surface glabrous, smooth, lower surface sparsely brownish strigillose on the main veins, smooth, cystoliths only beneath; lateral veins 9–11 pairs, most of them furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of some (or none?) of the lateral veins in the middle part of the lamina or (also) small ones in furcations of lateral veins or absent; petiole 1–3 cm long, glabrous, the epidermis persistent; stipules 1–3 cm long, glabrous, (sub)persistent. *Figs* axillary, ± concealed by the stipules, sessile; basal bracts 3, verticillate, c. 3 mm long; receptacle depressed-globose, c. 1.5 cm diam. when dry, glabrous, without lateral bracts, apex slightly convex to slightly concave, ostiole 2.5–3 mm diam., including 5 erect apical bracts; internal hairs sparse. *Style* of the long-styled flower glabrous.

Distribution — *Malesia*: Celebes (Menado, Malili).

Habitat — Forest, at altitudes between 200 and 1000 m.

Note — The species shows affinities to a group with axillary figs, including *F. multistipularis* and *F. boanensis*. It differs from the former in the subglabrous leafy twigs and stipules, the cuneate to rounded base of the lamina, and the shorter petioles and stipules. It differs from the latter in the persistent epidermis of the longer petiole and the cuneate to rounded base and dentate margin of the lamina.

81. Ficus ribes Reinw. ex Blume

Ficus ribes Reinw. ex Blume, Bijdr. (1825) 463; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 284, 297; Kurz, Forest Fl. Burma 2 (1877) 458; Solms, Bot. Zeit. (1885) 537; King, Sp. Ficus 2 (1888) 110,

t. 144; Fl. Brit. India 5 (1888) 524; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 201; Renner, Bot. Jahrb. Syst. 39 (1907) 398; Koord., Atlas Baumart. Java 4 (1918) t. 764; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 573; Backer & Bakh.f., Fl. Java 2 (1965) 28; Corner, Gard. Bull. Singapore 21 (1965) 85; Kochummen, Tree Fl. Malaya 3 (1978) 155. — *Covellia ribes* (Reinw. ex Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 325; Fl. Ind. Bat., Suppl. (1861) 434.

Covellia paniculata Miq., London J. Bot. 7 (1846) 467; Pl. Jungh. (1851) 67.

Ficus forbesii King. Sp. Ficus 2 (1888) 109, t. 143. — Type: *Forbes s.n.* (not traced), Sumatra, the plate used as type; it shows as elements a fig-bearing branch of *F. ribes* and a non-moraceous leafy twig; the former element is designated as lectotype here.

Ficus staphylosyce Ridl., Fl. Malay Penins. 3 (1924) 301; 5 (1925) 334; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 43.

Ficus bartlettii Merr., Pap. Michigan Acad. Sci. 19 (1934) 153.

Ficus yatesii Merr., Pap. Michigan Acad. Sci. 19 (1934) 154, t. 18.

Tree up to 20 m tall. *Leafy twigs* 1.5–3 mm thick, brown(ish) appressed-puberulous to strigillose, without (or occasionally with) nodal waxy glands; internodes hollow or solid; periderm persistent. *Leaves* (sub)distichous, sometimes subopposite; lamina (ob)lanceolate to subobovate to oblong, (2–)6–18(–29) by (1–)1.5–5.5(–10) cm, slightly to distinctly asymmetric, chartaceous, apex acuminate to caudate or to acute, base cuneate to obtuse, margin denticulate (at least) towards the apex; upper surface sparsely brownish to whitish strigillose to glabrous, smooth, lower surface sparsely (to rather densely) brown(ish) strigillose (or hirtellous) on the veins, smooth, cystoliths above and beneath; lateral veins (4–)6–10 pairs, none (or some) of them branched or furcate far 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, brown(ish) strigillose, the epidermis persistent; stipules 0.5–1(–1.8) cm long, brown(ish) strigillose, hirtellous to subsericeous (or glabrous), subpersistent or caducous. *Figs* cauliflorous, flagelliflorous, ramiflorous or sometimes axillary, mostly on clusters of rather slender to stout leafless branchlets up to 10 cm long or up to 1 m long on the (main) branches and the trunk, those at the base of the trunk becoming up to 4 m long stolons; peduncle 0.1–1(–1.6) cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose to depressed-globose or to subobovoid to ellipsoid, (0.4–)0.6–1.3(–1.5) cm diam. when dry, (0.7–)1–2 cm diam. when fresh, (sub)glabrous, up to 0.5 cm long stipitate or non-stipitate, (faintly) ribbed, without or with one or few lateral bracts, at maturity yellow-brown, pinkish or reddish, apex ± convex to flat, ostiole 2–3 mm diam., surrounded by 5 (or 6) erect apical bracts; internal hairs sparse to abundant, white to brownish.

Distribution — Thailand and Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java.

Habitat — Forest, at altitudes up to 1600(–2000) m.

Notes — 1. *Ficus ribes* is very closely related to *F. arfakensis*, as discussed under the latter.

2. Some collections from the lowlands of Atjeh (Gunung Leuser National Park) differ somewhat in having relatively large leaves with on the lower surface the hairs more or less patent (but appressed on the leafy twigs and petioles). This form could be confused with *F. serraria*, but it can be distinguished by the rather sparse appressed indumentum on the petioles and the leafy twigs, and the glabrous fig receptacle.

82. Ficus rubrosyce C.C. Berg

Ficus rubrosyce C.C. Berg, Blumea 49 (2004) 180.

Tree. *Leafy twigs* 1–2 mm thick, white appressed-puberulous with hairs of different length to glabrous, with (small) nodal glands; with persistent minute conical 'buds' in the leaf axils; internodes hollow; periderm flaking off (often starting below the leaves). *Leaves* subdistichous or subopposite; lamina oblong, 4.5–12.5 by 1.5–4 cm, slightly asymmetric, subcoriaceous, apex acuminate, base (sub)cuneate, margin (sub)entire; upper surface glabrous, smooth, lower surface very sparsely appressed-puberulous on the midrib, smooth, cystoliths only beneath; lateral veins 7–10 pairs, some or none of them furcate far from the margin, tertiary venation subscalariform to subreticulate; waxy glands absent; petiole 0.3–0.8 cm long, white puberulous adaxially, the epidermis flaking off; stipules 1.5–2 cm long, glabrous, caducous. *Figs* flagelliflorous on branched stolons with up to 1.5 cm long internodes; peduncle 0.4–0.5 cm long; basal bracts 3, verticillate, 1–1.5 mm long; receptacle subglobose, 0.9–1.1 cm diam. when dry, glabrous, without lateral bracts, red at maturity, apex ± convex, ostiole 2–3 mm diam., prominent; internal hairs sparse, brownish.

Distribution — *Malesia*: Sumatra.

Habitat — Montane forest, near streamlet, at altitudes of 1700–1800 m.

Note — This species shows clear affinities to *F. subterranea* and to *F. tarennifolia*. It differs from the former in the smaller leaves, the exfoliating periderm of the leaf twigs and the epidermis of the petiole, the smaller fig receptacle without lateral bracts, and the hairy style of the long-styled flower. It differs from the latter in the short petioles with exfoliating epidermis and the short peduncles.

83. Ficus satterthwaitei Elmer

Ficus satterthwaitei Elmer, Leafl. Philipp. Bot. 1 (1906) 199; 2 (1906) 543; 4 (1911) 1264, 1320; 7 (1914) 2392; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 64; Elmer, Leafl. Philipp. Bot. 9 (1937) 3449; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 311; Corner, Gard. Bull. Singapore 18 (1960) 51.

Ficus appendiculata Merr., Philipp. J. Sci. 18 (1921) 57; Enum. Philipp. Flow. Pl. 2 (1923) 45; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 314.

Ficus binuangensis Merr., Philipp. J. Sci. 18 (1921) 67; Enum. Philipp. Flow. Pl. 2 (1923) 47; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 314.

Ficus moderata Corner, Gard. Bull. Singapore 19 (1962) 396, t. 7; 21 (1965) 89.

Tree up to 12 m tall. *Leafy twigs* 2–6 mm thick, sparsely (to densely) white to brownish appressed-puberulous to strigillose or subglabrous, with (small) nodal waxy glands; internodes hollow; periderm flaking off (often starting below the leaves). *Leaves* spirally arranged, partly (sub)opposite or (on the ultimate branches) distichous; lamina oblong to elliptic to subobovate, (3.5–)5–20(–30) by (1.5–)2.5–10(–15) cm, usually ± asymmetric, subcoriaceous to chartaceous, apex (sub)acuminate, base cuneate to obtuse at one side, cuneate to rounded (to subcordate) at the other side, margin ± irregularly crenate-dentate to -denticulate (towards the apex) or (sub)entire, flat; upper surface sparsely white appressed-puberulous to strigillose, glabrescent or glabrous, smooth, lower surface sparsely white to brownish appressed-puberulous to strigillose on the

(main) veins or (sub)glabrous, smooth, cystoliths only beneath; lateral veins (4–)6–10 pairs, some (or most) of them branched or furcate far from the margin, tertiary venation ± loosely scalariform; waxy glands small, in the axils of some of the lateral veins in the middle part of the lamina or also in furcations of lateral veins; petiole 1–3(–8) cm long, sparsely (to rather densely) whitish to brownish appressed-puberulous to strigillose or (sub)glabrous, the epidermis flaking off; stipules 1–1.5(–4) cm long, white appressed-puberulous to whitish to brownish strigillose, only so at the base, or entirely glabrous, caducous. *Figs* cauliflorous on woody tubercles on the older wood (down to the trunk), developing into up to 10 cm long branched branchlets; peduncle 0.5–2 cm long; basal bracts 3, (usually) verticillate, 1.5–2.5 mm long; receptacle subglobose to pyriform to depressed-globose, 1.5–3(–3.5) cm diam. when dry, 2–4.5 cm diam. when fresh, non-stipitate or up to 0.2 cm long stipitate, (sub)glabrous, without lateral bracts, often finely ribbed, at maturity yellow to brown, apex convex to flat to concave, ostiole 5–10 mm diam.; internal hairs absent.

Distribution — *Malesia*: Borneo (Mt Kinabalu) and Philippines (Luzon, Negros, Luzon, Samar, Leyte, Mindanao).

Habitat — Forest, at altitudes up to 1300 m.

Notes — 1. This species appears to be very closely related to *F. nota* from which it can be distinguished by the base of the lamina being cuneate to rounded (or only at one side sometimes subcordate). Moreover, the indumentum of leafy twigs and laminas is usually sparser then in *F. nota* and can be almost absent. The two species have a similar range of distribution and may prove to be distinct only at an infraspecific level.

2. In the characters of vegetative parts, this species also shows similarities to *F. fistulosa*. Material with figs can be distinguished by the larger figs (1.5–2.5 cm diam. when dry) with the ostiole 5–10 mm in diameter. It differs from *F. congesta* in the short fig-bearing structures, up to 10 cm long woody tubercles, and the somewhat longer stipules. Although it has been united with *F. congesta* (Corner 1960), its features and disjunct occurrence justify reinstatement as a species, closer to *F. nota* than to *F. congesta*.

3. *Ficus moderata*, only known by the type collection from Mt Kinabalu (Borneo), is included in this species, as the only difference between the material from the Philippines and that from Borneo is found in the presence of 'lateral bracts' in the upper part of the fig receptacle, being 'displaced' apical bracts, thus, possibly an aberration.

84. Ficus saurauioides Diels

Ficus saurauioides Diels, Bot. Jahrb. Syst. 67 (1935) 205; Corner, Gard. Bull. Singapore 21 (1965) 91.

Shrub or treelet up to 3 m tall. *Leafy twigs* 4–8 mm thick, dark brown setose-hirsute, without nodal waxy glands; internodes hollow; periderm persistent. *Leaves* spirally arranged, ± tufted; lamina oblanceolate or ± sagittate-pandurate, 25–40 by 8–12 cm, symmetric, chartaceous, apex acute to acuminate, base subcordate, margin ciliate and dentate, towards the base coarsely dentate to sublobate; upper surface white strigose, ± scabrous, lower surface dark brown hirsute to hirtellous on the veins, paler hairs on the smaller veins, ± scabrous, cystoliths only beneath; lateral veins (9–)10–25 pairs,

some of them furcate far from the margin, the basal pairs slightly distinct, tertiary venation scalariform to reticulate; waxy glands absent (?); petiole 0.8–1.8 cm long, brown hirsute, the epidermis persistent; stipules 1.8–3 cm long, dark brown subsetose-hirsute, (sub)persistent. *Figs* axillary, solitary (?); peduncle 0.2–0.3 mm long; basal bracts 3, verticillate, 2.5–4 mm long; receptacle subglobose, 1–1.3 cm diam. when dry, dark brown strigillose with retrorse hairs, colour at maturity unknown, apex convex, ostiole 2–3 mm diam.; internal hairs absent or sparse. — **Fig. 82g–j.**

Distribution — *Malesia*: New Guinea.

Habitat — Lowland forest; rare.

Note — The long stiff hairs are blackish in living material. The lamina can be ± sagittate-pandurate or without constriction in its lower part.

85. Ficus schwarzii Koord.

Ficus schwarzii Koord., Minah. (1898) 607, 644; Corner, Gard. Bull. Singapore 18 (1960) 52; 21 (1965) 89; Kochummen, Tree Fl. Malaya 3 (1978) 155; Tree Fl. Sabah & Sarawak 3 (2000) 301.

Ficus miquelii King, J. Asiat. Soc. Bengal, Pt. 2, 4 (1886) 405, p.p. (part. typ. = *F. botryocarpa* Miq.); Sp. Ficus 2 (1888) t. 137; Fl. Brit. India 5 (1888) 524; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 363; Ridl., Fl. Malay Penins. 3 (1924) 341; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 34, f. 18, 19; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1011; Corner, Gard. Bull. Singapore 10 (1939) 286; Wayside Trees (1940) 685.

Ficus fistulosa auct. non Reinw. ex Blume: Kurz, Forest Fl. Burma 2 (1877) 459.

Ficus caulocarpa auct. non Miq.: Becc., For. Borneo (1902) 525; Merr., Enum. Born. (1921) 221.

Tree up 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 ± asymmetric, 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 beneath; lateral veins 6–12 pairs, rarely branched or furcate far from the margin, tertiary venation scalariform (to almost reticulate); waxy glands mostly absent, sometimes small ones 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* cauliflorous on branched (or unbranched) up to 60 cm long branchlets, on the trunk; peduncle 1–3 cm long, the epidermis flaking off; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose to subpyriform to depressed-globose, 1.2–2(–2.5) cm diam. when dry, 2–3.5 cm diam. when fresh, glabrous, the epidermis flaking off (at least in dry material), without lateral bracts, at maturity yellow or brownish, apex flat to slightly concave, ostiole 4–8 mm diam., surrounded by a rosette of erect bracts; internal hairs absent or sparse. — **Map 11.**

Distribution — Lower Myanmar, Thailand, and Malesia; in *Malesia*: Sumatra, Malay Peninsula, Borneo (incl. Anambas & Natoena Islands).

Habitat — Forest, often along streams, at altitudes up to 1200 m.

Note — This species resembles *F. tarennifolia*, from which it can easily be distinguished by the figs of which the apical bracts are distinct and point upwards and the epidermis of the receptacle which flakes off. Moreover, the lamina is usually entirely glabrous in *F. tarennifolia*, whereas (always) hairy, often sparsely so, in *F. schwarzii*.

86. Ficus scopulifera C.C. Berg

Ficus scopulifera C.C. Berg, Blumea 49 (2004) 181.

Tree up to 15 m tall. *Leafy twigs* 2–5 mm thick, (very) sparsely whitish appressed-puberulous to brownish strigillose or glabrous, with rather large nodal waxy glands; internodes hollow or solid; periderm flaking off. *Leaves* (sub)distichous or subopposite; lamina subobovate to oblong (to elliptic), 7–24 by 2.5–7.5 cm, slightly asymmetric, subcoriaceous, apex acuminate, base obtuse to subcuneate, margin crenate-dentate towards the apex; upper surface subglabrous or white appressed-puberulous to substrigillose, smooth, lower surface (very) sparsely whitish or brownish strigillose to appressed-puberulous on the main veins, smooth, cystoliths only beneath; lateral veins (4–)6–9 pairs, some or none of them branched or furcate far from the margin, tertiary venation loosely scalariform; waxy glands in slit-shaped extensions of the axils of 1 or 2 lateral veins in the middle of the lamina; petiole (1–)1.5–3.5 cm long, very sparsely whitish strigillose, the epidermis flaking off; stipules 1.5–2.5 cm long, glabrous or brownish strigillose at the base, subpersistent. *Figs* cauliflorous to flagelliflorous on rather slender (often broom-like) branched and with short subpersistent stipules branchlets on (the lower part of) the trunk, the ultimate branchlets slender (or the fig-bearing branchlets becoming up to 1 m long stolons with up to 5.5 cm long internodes and up to 1.5 cm long subpersistent stipules and terminally normal leaves); peduncle 0.5–3.5 cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose to obovoid, 1–1.3 cm diam. when dry, (sub)glabrous, up to 0.4 cm long stipitate, (faintly) ribbed, without lateral bracts, colour at maturity unknown, apex flat to concave, ostiole c. 2 mm diam., surrounded by 5 (or 6) erect apical bracts; internal hairs absent.

Distribution. — *Malesia*: New Guinea (Morobe Province).

Habitat — Montane forest, at altitudes between c. 1300 and 1800 m.

Note — This species is characterized by (sub)glabrous, relatively long subpersistent stipules. The broom-like branched fig-bearing branchlets appears to be another characteristic feature of this montane species. The species can be flagelliflorous. The relatively glabrous collections from the Morobe District have initially been referred to *F. arfakensis*, the others with some doubt to *F. congesta*. The closest relative could be *F. limbata*.

87. Ficus scortechinii King

Ficus scortechinii King, Sp. Ficus 2 (1888) 112, t. 147; Ridl., Fl. Malay Penins. 3 (1924) 343; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 36, f. 20, 21; Gard. Bull. Singapore 10 (1939) 286; Wayside Trees (1940) 686; Gard. Bull. Singapore 21 (1965) 94; Kochummen, Tree Fl. Malaya 3 (1978) 155; Tree Fl. Sabah & Sarawak 3 (2000) 302.

Ficus fasciculata King, Fl. Brit. India 5 (1888) 524, nomen illeg. (non F. Muell. ex Benth. 1873); Ridl., Fl. Malay Penins. 3 (1924) 343; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 42.

Tree up to 8 m tall. *Leafy twigs* 1.5–2.5 mm thick, (sparsely) brown strigillose, without or with small nodal waxy glands, hollow or solid; periderm persistent. *Leaves* (sub)distichous, rarely (sub)opposite, subobovate to oblanceolate, (4–)10–20(–28) by (1.5–)3.5–7(–8.5) cm, symmetric to slightly asymmetric, chartaceous, apex acuminate, base cuneate, margin entire to faintly denticulate; upper surface very sparsely strigillose, smooth, lower surface sparsely whitish to brownish strigillose to appressed-puberulous (or hirtellous), smooth, cystoliths only beneath; lateral veins 6–10 pairs, the lower ones not distinctly loop-connected, tertiary venation loosely scalariform; waxy glands absent; petiole 0.4–1.2 cm long, brownish to whitish strigillose, the epidermis flaking persistent (or flaking off); stipules 0.4–1.2 cm long, brownish strigillose (or hirtellous), subpersistent (or caducous). *Figs* cauliflorous on short woody tubercles (very short branched leafless branchlets) or on (clusters of) up to 15 cm long branchlets on the (base of the) trunk; peduncle 0.4–3 cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose to obovoid, 0.5–1 cm diam. when dry, 1–1.5 cm diam. when fresh, non-stipitate or up to 0.4 cm long stipitate, (sub)glabrous, faintly ribbed towards the ostiole, at maturity yellow to orange, apex ± convex, ostiole 2–3 mm diam., surrounded with short apical bracts; internal hairs sparse, brownish.

Distribution — Myanmar, Thailand, and Malesia; in *Malesia*: Malay Peninsula.

Habitat — Forest, at low altitudes.

Notes — 1. This species is very closely related to *F. ribes* and *F. arfakensis*, as discussed under the latter.

2. There are no indications that this species can be flagelliflorous like *F. arfakensis* and *F. ribes*.

3. The material referred to *F. scortechinii* var. *lanceata* is currently treated under *F. tarennifolia*.

4. One of the collections from the Malay Peninsula (*FRI 023349*) has ± patent hairs on the lamina beneath and the petiole.

88. Ficus septica Burm.f.

Ficus septica Burm.f., Fl. Ind. (1768) 226, excl. syn. Rheede [*F. septica* Rumph., Herb. Amb. 3 (1743) 153, t. 96]; G. Forst., Prodr. (1786) 76; Lam., Encycl. 2, 2 (1788) 496; Miq., Fl. Ind. Bat. 1, 2 (1859) 311; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 284, 297; Merr., Int. Rumph. (1917) 193; Enum. Born. (1921) 227; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 575; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1015; Diels, Bot. Jahrb. Syst. 67 (1935) 194; Summerh., J. Arnold Arbor. 22 (1941) 96; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 27; Backer & Bakh.f., Fl. Java 2 (1965) 32; Corner, Gard. Bull. Singapore 21 (1965) 92; Philos. Trans., Ser. B, 253 (1967) 153, t. 68; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 302, t. 11.

Ficus verrucosa Vahl, Enum. Pl. 2 (1805) 192; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Summerh., J. Arnold Arbor. 13 (1932) 106.

Ficus leucantatoma Poir. in Lam., Encycl., Suppl. 2 (1812) 654; Roem. & Schult., Syst. Veg. 1 (1817) 501, '*leucatoma*'; Link, Enum. Hort. Berol. 2 (1822) 449, '*leucatoma*'; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 283, 296, 306, '*leucantoma*'; Solms, Bot. Zeit. (1885) 546; King, Sp. Ficus 2 (1888) 119, t. 159; Koord., Minah. (1898) 603; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 464; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 215; Koord., Atlas Baumart. Java 4 (1918) t. 769. — *Covellia leucantatoma* (Poir.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 303.

Ficus venosa Willd., Hort. Berol. (1816) 36, t. 36, non Ait. 1789. — *Covellia venosa* (Willd.) Miq., London J. Bot. 7 (1848) 468; Fl. Ind. Bat. 1, 2 (1859) 326.

?*Ficus paludosa* Perr., Mém. Soc. Linn. Paris 3 (1825) 117.
Ficus leucopleura Blume, Bijdr. (1825) 443. — *Covellia leucopleura* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 326.
Ficus leucosticta Spreng., Syst. Veg. ed. 6, 3 (1826) 779. — *Cystogyne leucosticta* (Spreng.) Gasp., Giorn. Bot. Ital. 2 (1844) 217; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 347; Rendiconti Reale Accad. Sci. Fis. 25 (1845) 84, t. 8.
Ficus rapiformis Roxb., Fl. Ind., ed. Carey 3 (1832) 551; Wight, Ic. 2 (1843) t. 637; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 282, 296. — *Covellia rapiformis* (Roxb.) Miq., London J. Bot. 7 (1848) 464; Fl. Ind. Bat. 1, 2 (1859) 325.
Ficus radiata Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 494; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 284, 297. — *Covellia radiata* (Decne.) Miq., Fl. Ind. Bat. 1, 2 (1859) 328.
Ficus hauilii Blanco, Fl. Filip. (1837) 684; Merr., Philipp. J. Sci., 1, Suppl. (1906) 45; Elmer, Leafl. Philipp. Bot. 1 (1906) 53, 191; 2 (1907) 250, 541; Merr., Philipp. J. Sci., Bot. 2 (1907) 270; 3 (1908) 402; 5 (1910) 342; Elmer, Leafl. Philipp. Bot. 4 (1911) 1253, 1316, 1395; Merr., Sp. Blancoan. (1918) 127; Enum. Philipp. Flow. Pl. 2 (1923) 53; Elmer, Leafl. Philipp. Bot. 9 (1937) 3471; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 271.
Covellia stictocarpa Miq., Pl. Jungh. (1851) 65; Fl. Ind. Bat. 1, 2 (1859) 327, t. 23A. — *Ficus stictocarpa* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 284, 297.
Ficus geminifolia Miq. in Zoll., Syst. Verz. 2 (1854) 93, 99; Miq., Fl. Ind. Bat. 1, 2 (1859) 313.
Ficus oldhamii Hance, Advers. Stirp. Asiat. Orient. (1866) 43; Ann. Sci. Nat. Bot., Sér. 5, 5 (1870) 242; Maxim., Bull. Acad. Imp. Sci. Saint-Pétersbourg 11 (1883) 334.
Ficus philippinensis Bonard ex Hérincq, Hort. France (1869) 244.
Ficus casearia F. Muell. ex Benth., Fl. Austral. 6 (1873) 177; F.M. Bailey, Queensl. Fl. 5 (1902) 1479; Compr. Cat. Qld. Pl. (1913) 504; Domin, Bibl. Bot. 89 (1921) 570; Summerh., J. Arnold Arbor. 10 (1929) 148.
Ficus didymophylla Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 200.
Ficus laxiramea Elmer, Leafl. Philipp. Bot. 4 (1911) 1257; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 273.
Ficus kaukauensis Hayata, Ic. Pl. Formos. 7 (1918) 35; 8 (1919) 127, t. 54.
Ficus brunnea Merr., Philipp. J. Sci. 18 (1921) 56; Enum. Philipp. Flow. Pl. 2 (1923) 47; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 252.
Ficus linearis Merr., Philipp. J. Sci. 18 (1921) 65; Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 263.
Ficus septica Burm.f. var. *cauliflora* Corner, Gard. Bull. Singapore 18 (1960) 61; Philos. Trans., Ser. B, 253 (1967) 155, t. 68; Summerh., J. Arnold Arbor. 22 (1941) 97 (sub *F. septica*).
Ficus septica Burm.f. var. *salicifolia* Corner, Gard. Bull. Singapore 18 (1960) 62.
Ficus laccifera auct. non Roxb.: Blanco, Fl. Filip. (1837) 673.

Shrub or tree up to 25 m tall; latex yellowish. *Leafy twigs* 2–7(–10) mm thick, glabrous (or white to brownish hirtellous to subtomentose), with nodal waxy glands; internodes hollow; periderm ± flaking off. *Leaves* spirally arranged or (partly) subopposite; lamina elliptic to oblong (to obovate to ovate or to lanceolate), (7–)15–28(–35) by (3–)5–14(–30), (almost) symmetric, (sub)coriaceous, apex subacute to subacuminate to obtuse to rounded, base cuneate to rounded (to subcordate), if broad usually subattenuate, margin entire; both surfaces glabrous, cystoliths only beneath; lateral veins 6–12(–15) pairs, often furcate far from the margin, the basal pair weakly developed, tertiary venation scalariform to reticulate; waxy glands in the axils of some lateral veins or absent; petiole (0.5–)1–5(–12) cm long, glabrous (or white to brownish hirtellous to subtomentose), epidermis flaking off; stipules 1–6(–8) cm long, glabrous, caducous. *Figs* axillary or just below the leaves, solitary, in pairs or up to 4 together on short

spurs in the leaf axils, with a peduncle 0.2–1.2(–2.2) cm long (or sessile); basal bracts 3, verticillate, 1–2 mm long; receptacle depressed-globose (or ellipsoid), 1.5–2(–3.5) cm diam. when dry, 2–3(–5) cm diam. when fresh, non-stipitate (or up to 0.7 cm long stipitate), without lateral bracts, with 7–12 ribs towards the ostiole, glabrous, whitish to yellowish maculate at maturity, apex ± concave to flat, ostiole 2–4 mm diam., ± sunken, flat or ± prominent; internal hairs sparse, short, white. — **Map 12.**

Distribution — NE India to S China to Taiwan and Malesia to Australia (Queensland) and to the New Hebrides; in *Malesia*: throughout.

Habitat — Lowland and montane forest or secondary growth, often near rivers, at altitudes up to 1800 m.

Notes — 1. The plant parts are usually glabrous, but material from the Philippines may be white strigose or white to brown hirtellous to subtomentose on leafy twigs and petioles. The lamina of this hairy form can be lanceolate. A form with white substrigose leafy twigs and petioles occurs in the Solomon Islands.

2. Several collections with very large laminas, often with subcordate bases, with petioles up to 12 cm long, and fig receptacles up to 3.5 cm diam. (when dry) have been made in Central Celebes.

3. A cauliflorous form with the figs on slender leafless branchlets up to 60 cm long on the trunk occurs in Australia (Queensland) and the Solomon Islands.

4. A willow-leaved form is known from the Philippines.

89. Ficus serraria Miq.

Ficus serraria Miq., Fl. Ind. Bat., Suppl. (1861) 428; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 292. — *Ficus ribes* Reinw. ex Blume var. *serraria* (Miq.) Corner, Gard. Bull. Singapore 18 (1960) 44.

Tree up to 10 m tall. *Leafy twigs* 2–4 mm thick, ± densely dark to pale brown hirtellous or substrigose, the longer stiff hairs intermixed with (sparse) shorter and softer white hairs, often with small nodal waxy glands; internodes hollow; periderm persistent. *Leaves* (sub)distichous; lamina oblong to subobovate or elliptic to obovate, (4–)6–14(–21) by (2–)3–6(–8) cm, usually ± asymmetric, chartaceous, apex acuminate to subcaudate, base cuneate to obtuse (to rounded), margin (crenate-)dentate to denticulate to subentire; upper surface sparsely to rather densely brown puberulous to whitish strigillose, smooth or scabridulous, lower surface brown(ish) hirtellous to puberulous or substrigose on the (main) veins, the longer stiff hairs intermixed with (sparse) shorter and softer white hairs, smooth, cystoliths above and beneath; lateral veins 6–10(–12) pairs, none or (in large leaves) some of them branched or furcate far from the margin, tertiary venation ± loosely scalariform; waxy glands absent; petiole 0.5–1.5 cm long, brown(ish) hirtellous, the epidermis persistent; stipules 0.6–1.5 cm long, brown(ish) strigillose to subhirtellous (or glabrous), caducous (or subpersistent). *Figs* cauliflorous to flagelliflorous on spurs or up to 10 cm (or longer?), slender branchlets on the trunk, or on up to 1 m long stolons; peduncle 0.4–0.8 cm long; basal bracts 3, verticillate, c. 1 mm long; receptacle subglobose, 0.6–0.8 cm diam. when dry, c. 1 cm diam. when fresh, brown (sub)hirtellous to puberulous, non-stipitate or up to 0.3 cm long stipitate, not ribbed, without lateral bracts, red to purple at maturity, apex ± convex, ostiole 2.5–3 mm diam., ± prominent; internal hairs sparse, brownish.

Distribution — *Malesia*: Sumatra.

Habitat — Forest, at altitudes between c. 1000 and 2200 m.

Note — This species was included in *F. ribes*, but in its indumentum it is distinct enough to regard it as a separate species, possibly more closely related to *F. vrieseana* than to *F. ribes*. It is distinct from the latter in the ± dense, mostly patent brown(ish) hairs on the leafy twigs petioles and leaves, intermixed with shorter white hairs, and the hirtellous to puberulous fig receptacle. It is distinct from *F. vrieseana* in the cystoliths which also occur on the upper surface of the lamina.

90. Ficus stolonifera King

Ficus stolonifera King, Sp. Ficus 2 (1888) 104, t. 132; Merr, Enum. Born. (1921) 227; Gard. Bull. Singapore 21 (1965) 91; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 306.

Tree up to 15 m tall. *Leafy twigs* 2–3 mm thick, brown hirsute to hirtellous or strig(ill)ose, the longer stiff hairs (often with an echinate base and) intermixed with shorter and softer white hairs, with (small) nodal glands; internodes hollow; periderm persistent. *Leaves* distichous (to subopposite); lamina oblong to subobovate, 8–34 by 3.5–17 cm, asymmetric (to nearly symmetric), chartaceous, apex acuminate, base obtuse to rounded (or at the broad side) cordate, margin denticulate to dentate (towards the apex); upper surface hispidulous to strigillose, ± scabrous, on the midrib to hirtellous, lower surface brown(ish) hirtellous or strigillose, the longer stiff hairs (often with an echinate base and) intermixed with (sparse to dense) shorter and softer white hairs, ± scabrous, cystoliths only beneath; lateral veins (5–)7–12 pairs, none or some of them furcate far from the margin, tertiary venation (rather loosely) scalariform to subreticulate; waxy glands (in some of the leaves) in slit-shaped extensions of the axils of 1 or 2 lateral veins in the middle part of the lamina; petiole 0.5–1.2 cm long, brown hirtellous, the longer stiff hairs (often with an echinate base and) intermixed with shorter and softer white hairs, the epidermis persistent; stipules 1.5–4 cm long, white appressed-puberulous to subsericeous, partly (on the keel) brown strigose to subhirsute, caducous. *Figs* flagelliflorous on up to 7 m long, sparsely branched, stolons with up to 4 cm long internodes; peduncle 0.1–0.3 cm long; basal bracts 3(–8), verticillate (or subverticillate), 1.5–2 mm long; receptacle subglobose, 0.8–1.2 cm diam. when dry, glabrous or brown puberulous, with few short (suborbicular) lateral bracts, at maturity reddish, apex ± convex; ostiole 2–3 mm diam., slightly impressed; internal hairs absent.

Distribution — *Malesia*: Borneo (Brunei, Sarawak).

Habitat — Forest, at altitudes up to 1200 m.

91. Ficus subcongesta Corner

Ficus subcongesta Corner, Gard. Bull. Singapore 18 (1961) 93, t. 6; 21 (1965) 88.

Ficus subcongesta Corner var. *symmetrica* Corner, Gard. Bull. Singapore 18 (1961) 95; Philos. Trans., Ser. B, 253 (1967) 152.

Tree up to 20 m tall. *Leafy twigs* 2.5–5 mm thick, densely (to sparsely) brown(ish) hirtellous to strigillose to subhispidulous, to whitish appressed- (to patent-)puberulous to strigillose, with (or without?) nodal waxy glands; internodes hollow; periderm flaking

off (often starting below the leaves). *Leaves* spirally arranged, subdistichous or (sub)-opposite; lamina oblong, 8–28(–34) by 3–12(–15) cm, ± asymmetric (or symmetric), chartaceous to subcoriaceous, apex acuminate, base cordate to subcordate (to rounded) at the broad side, subcordate to rounded (to obtuse) at the narrow side, margin ± irregularly crenate-dentate to -denticulate, flat; upper surface white strigillose to appressed-puberulous, scabridulous to smooth, lower surface (sometimes sparsely) strigose to strigillose to hirtellous to white appressed-puberulous on the veins, on the main vein hairs distinctly different in length, smooth, cystoliths only beneath; lateral veins 7–12 pairs, some (or none) of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands small, in the axils of some of the lateral veins in and above the middle part of the lamina or also in furcations of lateral veins; petiole (1–)2–4.5 cm long, brownish strigillose to hirtellous to puberulous, the epidermis flaking off; stipules (1.2–)1.5–2.5 cm long, densely (to sparsely) brownish to whitish strigillose to white appressed-puberulous, caducous (or subpersistent). *Figs* cauliflorous to flagelliflorous on (often strongly) branched up to 10(–25) cm long branchlets on the trunk or on up to 3 m long stolons; peduncle (0.3–)0.5–1.5(–2) cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose to ellipsoid or to depressed-globose, 0.8–1.5 cm diam. when dry, 1.5–2.5 cm diam. when fresh, non-stipitate, sparsely to rather densely (brown) puberulous, glabrescent, without lateral bracts, often finely ribbed, pinkish or reddish brown at maturity, apex convex to flat, ostiole c. 2 mm diam., surrounded by 5 apical bracts or elevated ends of ribs; internal bristles absent or sparse.

Distribution — Malesia and the Solomon Islands; in *Malesia*: New Guinea (Morobe Province, New Britain, Admiralty Islands).

Habitat — Forest and secondary growth, in swamp forest, and near streams, at altitudes up to c. 900 m.

Notes — 1. This species can be distinguished from the related *F. congesta* by the long stipules, the common presence of a cordate to subcordate base of the lamina, at least on the broad side, the waxy glands occurring not only in the middle part of the lamina but also in the axils of lateral veins above the middle, and the relatively long petioles. The figs differ from those of *F. congesta* by the small ostiole. The long-styled flowers have a saccate perianth in contrast to *F. congesta*.

2. This species is also closely related to *F. macrothyrsa*, a species of the Solomon Islands, and to *F. tunicata* from the Key Islands (Moluccas).

92. Ficus sublimbata Corner

Ficus sublimbata Corner, Gard. Bull. Singapore 18 (1960) 50; 21 (1965) 88.

Tree up to 10 m tall. *Leafy twigs* 3–7 mm thick, glabrous or appressed-puberulous to strigillose, with (large) nodal waxy glands; internodes hollow; periderm flaking off. *Leaves* spirally arranged to subopposite; lamina elliptic to oblong to (sub)obovate, (5–)8–25(–35) by 4–14(–17) cm, ± asymmetric to almost symmetric, chartaceous, apex acuminate, base cuneate to subcordate, margin denticulate to subentire; upper surface whitish strigose to strigillose, ± scabrous, lower surface whitish strigose to strigillose on the veins, ± scabrous, cystoliths only beneath; lateral veins (5–)7–11 pairs,

mostly branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of some lateral veins in the middle part of the lamina; petiole 1.5–6 cm long, whitish hirtellous to subglabrous, the epidermis flaking off; stipules 1.5–3.5 cm long, brown strigose, subpersistent. *Figs* cauliflorous on branched up to 70 cm long branchlets, on the trunk and main branches, the internodes up to 2(–6) cm long, the nodes with short or up to 1.5 cm long glabrous to whitish strigillose stipules; peduncle 0.5–1.5 cm long; basal bracts 3, verticillate, 3–6 mm long; receptacle depressed-globose to subglobose, 1.3–2 cm diam. when dry, whitish puberulous, glabrescent, faintly ribbed, without lateral bracts, red-brown, purple-brown or purple-red at maturity, apex convex to flat, ostiole 4–7 mm diam., surrounded by 5 apical bracts, slightly prominent; internal hairs sparse to abundant, brown.

Distribution — *Malesia*: New Guinea.

Habitat — Montane forest and grassland, at altitudes between 1500 and 2000 m.

93. Ficus subterranea Corner

Ficus subterranea Corner, Gard. Bull. Singapore 18 (1960) 60; 21 (1965) 92; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 307.

Shrub or treelet up to 5 m tall. *Leafy twigs* 1–2 mm thick, white appressed-puberulous with hairs of different length to glabrous, with (small) nodal glands; with persistent up to 8 mm long subulate 'buds' in the leaf axils; internodes hollow; periderm persistent. *Leaves* distichous; lamina oblong to lanceolate, 7–26 by 2.5–8 cm, (almost) symmetric, chartaceous to subcoriaceous, apex acuminate, base obtuse to cuneate, margin (sub)entire; upper surface glabrous, smooth, lower surface white appressed-puberulous on the main veins, smooth, cystoliths only beneath; lateral veins 10–16 pairs, none of them furcate far from the margin, tertiary venation scalariform; waxy glands (in some of the leaves) in slit-shaped extensions of the axils of 1 or 2 lateral veins in the middle part of the lamina; petiole 0.5–1.5 cm long, white puberulous, the epidermis persistent; stipules 1.5–3 cm long, white appressed-puberulous along the keel, caducous. *Figs* flagelliflorous on branched stolons with up to 2 cm long internodes; peduncle 0.1–0.3 cm long; basal bracts 3(–6), verticillate (or subverticillate), 2–5 mm long; receptacle subglobose, when dry 1.2–1.6 cm diam., puberulous, with several flat lateral bracts, colour at maturity unknown, apex ± convex, ostiole 2–3 mm diam.; internal hairs absent.

Distribution — *Malesia*: Borneo (Brunei: S Belalong; Sabah: Mt Kinabalu).

Habitat — Forest, along streams, at altitudes up to 1500 m.

Note — This species shows clear affinities to *F. rubrosyce* and *F. tarennifolia*. It is distinct by the presence of lateral bracts on the fig receptacle.

94. Ficus sulcata Elmer

Ficus sulcata Elmer, Leafl. Philipp. Bot. 4 (1912) 1377; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 66; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 317.

Ficus mirabilis Merr., Philipp. J. Sci. 18 (1921) 58; Enum. Philipp. Flow. Pl. 2 (1923) 58; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 305.

Treelet up to 5 (or more?) m tall. *Leafy twigs* 3–8 mm thick, whitish hirtellous, the hairs of about the same length, with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* spirally arranged to subdistichous or (sub)opposite; lamina oblong to subobovate to lanceolate, (8–)15–25 by (3.5–)7–11 cm, (almost) symmetric, chartaceous, apex acuminate, base cuneate to subcordate, margin denticulate; upper surface strigillose to hispidulous, scabrous, lower surface whitish hirtellous to strigillose on the veins, scabridulous, cystoliths only beneath; lateral veins 7–10 pairs, often branched or furcate far from the margin, tertiary venation scalariform; waxy glands in slit-shaped extensions of the axils of some lateral veins in the middle part of the lamina; petiole (1–)3–5 cm long, whitish hirtellous to subhispid, the epidermis persistent; stipules 1.2–3.5 cm long, whitish to brownish hirtellous to substrigose, (usually) subpersistent. *Figs* flagelliflorous on branched (or unbranched?) stolons with up to 6 cm long internodes, the figs on lateral branches with short internodes; peduncle 0.4–0.8 cm long, slender; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose to obovoid to subpyriform, non-stipitate or up to 0.2 mm long stipitate, 1–1.3 cm diam. when dry, c. 2.5 (?) cm diam. when fresh, whitish subhispidulous, 5+5-ribbed, without lateral bracts, red at maturity, apex flat to somewhat concave, ostiole c. 3 mm diam., depressed, surrounded the prominent ends of the major ribs; internal hairs absent or sparse, whitish.

Distribution — *Malesia*: Philippines (Palawan and Panay).

Habitat — Forest and secondary growth, at low altitudes.

Note — Although *F. sulcata* has been included in the typical variety of *F. vrieseana* by Corner (1965), the differences between the collections from Sumatra and Java (currently under *F. vrieseana*) and those of the Philippines (currently under *F. sulcata*) are such that keeping them in two taxa at the species level appears to be justified. The differences are: e.g., lamina (almost) symmetric versus distinctly asymmetric, stipules subpersistent (and relatively long) versus (usually) caducous, ostiole small and ± depressed versus larger and prominent.

95. Ficus tarennifolia Corner

Ficus tarennifolia Corner, Gard. Bull. Singapore 18 (1960) 62; 21 (1965) 93; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 308.

Ficus scortechinii King var. *lanceata* Corner, Gard. Bull. Singapore 19 (1962) 401.

Tree up to 13 m tall. *Leafy twigs* 2–4 mm thick, very sparsely appressed-puberulous or (sub)glabrous (or brown puberulous to substrigillose), without or with nodal waxy glands; with persistent minute conical 'buds' in the leaf axils; internodes hollow; periderm persistent. *Leaves* laxly spirally arranged, (sub)distichous or subopposite; lamina (ob)lanceolate to sublinear or (to subobovate or to oblong), (3–)6–21 by (1–)2–5 cm, often slightly asymmetric, subcoriaceous, apex (sub)acuminate to subacute, base cuneate to obtuse, margin entire to (faintly) denticulate; upper surface glabrous (or appressed-puberulous on the midrib), smooth, lower surface (sub)glabrous, smooth, cystoliths only beneath; lateral veins 6–10(–12) pairs, none of them branched or furcate far from the margin, tertiary venation subreticulate to loosely scalariform; waxy glands minute in the axils of some of the lateral veins in the middle part of the lamina, sometimes also a single much larger one at the base of the lamina; petiole (0.5–)1–2 cm long,

(sub)glabrous (or sparsely brownish strigillose), the epidermis persistent; stipules 1–2 cm long, glabrous, caducous (or subpersistent). *Figs* cauliflorous to flagelliflorous on clusters of up to 10 cm long branchlets, on the older wood, or on stolons with caducous stipules; peduncle 0.5–1.2 cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose to obovoid to pyriform, 1–1.5 cm diam. when dry, 1.5–2 cm diam. when fresh, (sub)glabrous, non-stipitate or up to 0.4 cm long stipitate, not or ± faintly ribbed, without lateral bracts, yellow, pink or purple at maturity, apex ± convex, ostiole 3–3.5 mm diam., ± prominent; internal hairs absent or sparse.

Distribution — *Malesia*: Borneo (northern).

Habitat — Montane forest, at altitudes between (500–)1000 and 3000 m.

Notes — 1. This species resembles the widespread lowland species *F. fistulosa* in many features, such as in the features of the figs, which are, however, usually on spurs or woody tubercles also on lesser branches. It can be distinguished from the (sub)glabrous specimens of *F. fistulosa* by the persistent periderm of the leaf twig and the persistent epidermis of the petiole and the common presence of nodal waxy glands.

2. It also shows affinities to *F. schwarzii*, from which it clearly differs in the figs of which the epidermis is persistent and the apical bracts are inconspicuous.

96. Ficus ternatana (Miq.) Miq.

Ficus ternatana (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; King, Sp. Ficus 2 (1888) 185; Corner, Gard. Bull. Singapore 21 (1965) 94. — *Covellia ternatana* Miq., Fl. Ind. Bat. 1, 2 (1859) 324.

Tree up to 20 m tall. *Leafy twigs* 1.5–3 mm thick, brown(ish) appressed-puberulous to strigillose, without nodal waxy glands; internodes hollow or solid; periderm flaking off below the leaves (but not conspicuously); scars of the leaves rather prominent and conspicuous; often small conical 'buds' in the leaf axils and on the nodes below the leaves. *Leaves* (sub)distichous or subopposite; lamina oblong to subobovate, (4–)6–17 by 2–6.5 cm, ± asymmetric, chartaceous, apex acuminate, base obtuse to rounded (to subcuneate), margin crenate-denticulate to -dentate; upper surface sparsely brownish strigillose, smooth, lower surface sparsely to rather densely brownish strigillose on the veins, smooth, cystoliths only beneath; lateral veins (4–)6–9 pairs, none of them branched or furcate far from the margin, tertiary venation loosely scalariform to subreticulate; waxy glands absent; petiole (0.4–)0.7–2 cm long, brown(ish) strigillose, the epidermis flaking off or persistent; stipules 0.6–1(–1.2) cm long, (sparsely) brownish to whitish strigillose to puberulous, mainly along the keel, caducous. *Figs* axillary and solitary (or cauliflorous?); peduncle 0.2–0.6 cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle depressed-globose, 1.5–2 cm diam. when dry, brown strigillose to puberulous, non-stipitate, ± pronouncedly 6–15-ribbed, without lateral bracts, colour at maturity unknown, apex flat to slightly concave, ostiole 3–3.5 mm diam.; internal hairs absent or sparse.

Distribution — *Malesia*: Moluccas (Ternate).

Habitat — Forest, at altitudes between 1250 and 1500 m.

Notes — 1. This species is related to *F. benguetensis* from which it differs in the depressed-globose and distinctly ribbed fig receptacle, the shorter basal bracts, the shorter stipules, and the consistently crenate-dentate margin of the lamina.

2. It may also be related to the cauliflorous *F. manuselensis*.

3. The crenate-dentate leaf margin and the numerous ribs on the fig receptacle could indicate affinity to *F. congesta*.

97. Ficus treubii King

Ficus treubii King, Sp. Ficus 2 (1888) 105, t. 134; Merr., Enum. Born. (1921) 228; Gard. Bull. Singapore 21 (1965) 91.

Tree up to 17 m tall. *Leafy twigs* 1.5–2.5 mm thick, pale brown strig(ill)ose to hirtellous, with (conspicuous) nodal glands; internodes hollow; periderm persistent. *Leaves* distichous; lamina oblong to elliptic to (sub)obovate or to lanceolate, (5–)10–30 by (1.5–)3–12 cm, slightly asymmetric, chartaceous, often drying greenish, apex (sub)caudate, base cuneate to obtuse to rounded (to emarginate), margin towards the apex (and on the acumen) denticulate, mostly ± revolute; upper surface glabrous, smooth, lower surface pale-brown appressed-puberulous to strigillose, smooth, cystoliths only beneath; lateral veins 7–12 pairs, towards the base closer together, none, some or most of them furcate far from the margin, tertiary venation scalariform, in the middle part of the lamina running perpendicular to the midrib; waxy glands in the axils of some lateral veins in the middle part of the lamina or also in furcations of lateral veins; petiole 0.3–1.2 cm long, brownish strigillose to hirtellous, the epidermis persistent; stipules 0.8–1.7 cm long, on the keel pale brown subsericeous, often subpersistent. *Figs* cauliflorous to flagelliflorous on pendulous slender branches and up to 6 m long stolons with up to 5 cm long internodes; peduncle 0.2–0.6 cm; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose, 0.8–1.2 cm diam. when dry, 1.2–1.6 cm diam. when fresh, whitish puberulous or (sub)glabrous, usually with 1 or 2 flat lateral bracts, yellow-brown at maturity, apex ± convex to flat, ostiole 2–3 mm diam., surrounded by some raised apical bracts; internal hairs sparse to abundant or absent.

Distribution — *Malesia*: Borneo.

Habitat — Forest, at altitudes up to 1600(–2000) m.

98. Ficus tunicata Corner

Ficus tunicata Corner, Gard. Bull. Singapore 18 (1960) 51; 21 (1965) 88.

Tree. *Leafy twigs* 3–4 mm thick, brown strigillose, with nodal waxy glands; internodes hollow; periderm flaking off. *Leaves* spirally arranged; lamina ovate to elliptic, 13–23 by 5–12 cm, symmetric, chartaceous, apex subacuminate, base subcordate, margin crenate-denticulate; upper surface sparsely puberulous to strigillose, mainly on the main veins, scabridulous, lower surface brown strigillose, ± scabrous, cystoliths only beneath; lateral veins 6–9 pairs, mostly branched or furcate far from the margin, tertiary venation lax scalariform; waxy glands in axils of lateral veins in and above the middle part of the lamina; petiole 2–3.5 cm long, brown strigillose, the epidermis flaking off; stipules c. 1.5 cm long, brown strigillose, caducous. *Figs* cauliflorous on shortly branched up to 5 cm long branchlets with up to 0.2 cm long stipules, on the older wood; peduncle 0.2–0.4 cm long; basal bracts 3, verticillate, 1–1.5 mm long; receptacle subglobose, c. 1 cm diam. when dry, non-stipitate, glabrous, pulverulent, faintly ribbed,

without lateral bracts, colour at maturity unknown, apex flat to slightly concave; ostiole c. 2.5 mm diam., surrounded by 5 small apical bracts; internal hairs abundant, brown.

Distribution — *Malesia*: Moluccas (Great Kai Island).

Habitat — Lowland forest.

Note — This species is in vegetative parts quite similar to *F. subcongesta*, in particular to specimens with symmetric and ± scabrous laminas, but it clearly differs in features of the figs, as in the glabrous surface of the receptacle and the abundant internal hairs.

99. Ficus uncinata (King) Becc.

Ficus uncinata (King) Becc., For. Borneo (1902) 527; Wand. (1904) 394; Merr., Enum. Born. (1921) 228; Corner, Gard. Bull. Singapore 18 (1960) 58; 21 (1965) 91; Kochummen, Tree Fl. Malaya 3 (1978) 159; Tree Fl. Sabah & Sarawak 3 (2000) 310. — *Ficus geocarpa* Teijsm. ex Miq. var. *uncinata* King, Sp. Ficus 2 (1888) 127, t. 129; H.P.J. Winkl., Bot. Jahrb. Syst. 49 (1913) 363.
Ficus uncinata (King) Becc. var. *gracilis* Corner, Gard. Bull. Singapore 18 (1960) 58.
Ficus uncinata (King) Becc. var. *parva* Corner, Gard. Bull. Singapore 18 (1960) 59.
Ficus uncinata (King) Becc. var. *pilosior* Corner, Gard. Bull. Singapore 18 (1960) 59.
Ficus uncinata (King) Becc. var. *truncata* Corner, Gard. Bull. Singapore 18 (1960) 59.
?*Ficus uncinata* (King) Becc. var. *strigosa* Corner, Gard. Bull. Singapore 18 (1960) 59, see note 2.
Ficus uncinata (King) Becc. var. *subbeccarii* Corner, Gard. Bull. Singapore 19 (1962) 401.
Ficus geocarpa auct. non Teijsm. ex Miq.: King, Sp. Ficus 2 (1888) 102 (p.p. Beccari 2797, 2901, Sarawak); Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 17, f. 5–7; Wayside Trees (1940) 681, t. 252.
Ficus hypogaea auct. non King: Merr., Enum. Born. (1921) 224.

Shrub or tree up to 8 m tall. *Leafy twigs* 2.5–5 mm thick, brown (sub)hirsute to hispid, the longer stiff hairs intermixed with shorter and softer white hairs, often with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* distichous (drooping); lamina oblong to subobovate to (ob)lanceolate, (6–)10–30(–45) by (1.5–)5–10(–16) cm, asymmetric, chartaceous, apex acuminate to (sub)caudate, base cuneate to subcordate at the narrow side, rounded to deeply cordate to auriculate at the broad side, the lobe often covering the petiole, margin dentate to serrate in the acumen; upper surface whitish to brownish strigose to hirtellous on the main veins or to hispidulous, ± scabrous, lower surface (dark to pale) brown (sub)hirsute on the veins, the longer stiff hairs intermixed with shorter and softer white hairs, ± scabrous (to scabridulous or smooth), cystoliths only beneath; lateral veins (4–)8–12(–14) pairs, at the broad side of the lamina some or most of them furcate far from the margin, tertiary venation scalariform, in the upper part of the lamina running perpendicular to the midrib; waxy glands in the axils of some lateral veins in the middle part of the lamina; petiole 0.5–1.5(–2.5) cm long, brown (sub)hirsute, the longer stiff hairs intermixed with shorter and softer white hairs, the epidermis persistent; stipules 1.5–4(–5.5) cm long, brown to whitish subsericeous or partly brown strigose, caducous or subpersistent. *Figs* flagelliflorous on up to 10 m long slender stolons with up to 10 cm long internodes, often extending into leafy shoots; figs with a peduncle up to 0.6 cm long or sessile; basal bracts 3 and verticillate, or up to 7 and subverticillate, 3–7 mm long; receptacle depressed-globose to obovoid to pyriform, (1–)1.5–3 cm diam. when dry, (1.5–)2–4 cm diam. when fresh, sometimes slightly stipitate, brown puberulous to hirtellous to subhispid, with numer-

Fig. 91. *Ficus uncinata* (King) Becc. Trunk with stolon-like fig-bearing branchlets, Kinabalu, Sarawak. Photo E.J.H. Corner.

ous ± incurved lateral bracts, pink to red to dark red-brown to purplish at maturity, apex ± convex; ostiole 4–5 mm, including the rosette of apical bracts, 7–8 mm diam., ± prominent; internal hairs absent. — **Fig. 78g, h, 91.**

Distribution — *Malesia*: Borneo (and Sumatra?).

Habitat — Forest, often along streams, at altitudes up to 1800 m.

Notes — 1. The species is very variable in the indumentum on the various parts of the plants (including the figs) and in the size and shape of the lamina. In some of the collections, the indumentum is whitish (var. *parva*), whereas it is commonly brown, sometimes dark brown. The fig receptacle can be almost glabrous or more or less densely hairy, sometimes dark brown subsetose. The occurrence of these hairs is often correlated with a very scabrous upper surface of the lamina and one side of the asymmetric lamina narrow with only 4–6 lateral veins (var. *gracilis* and var. *strigosa*).

2. It is doubtful whether some collections from the Malay Peninsula referred to *F. uncinata* var. *strigosa* by Corner belong to this (essentially) Bornean species; see also note 1 under *F. vrieseana*.

3. A sterile collection from Sumatra (Jambi, Sungai Peminyin-Muarabungo) probably represent this species.

4. The figs are edible.

100. Ficus virescens Corner

Ficus virescens Corner, Gard. Bull. Singapore 19 (1962) 398, t. 8; 21 (1965) 91; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 316.

Tree up to 13 m tall. *Leafy twigs* 1.5–2.5 mm thick, brown strigillose, with nodal glands; internodes hollow; periderm persistent. *Leaves* spirally arranged or subopposite; lamina oblong to subobovate, 12–30 by 4–12 cm, slightly asymmetric to symmetric, chartaceous, often drying greenish beneath, apex acuminate, base cuneate to rounded, margin towards the apex denticulate, mostly ± revolute; upper surface glabrous, smooth, lower surface brown strigillose on the veins, smooth cystoliths only beneath; lateral veins 6–8 pairs, none or (in larger leaves) some of them branched or furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of some lateral veins in the middle part of the lamina or also in furcations of lateral veins; petiole (1.5–)2–7 cm long, brown strigillose, the epidermis persistent; stipules 0.8–1.5 cm long, on the keel brown strigillose, caducous. *Figs* cauliflorous on stout branched up to 30 cm long branchlets, on the older wood; peduncle 0.5–2.2 cm; basal bracts 3, verticillate, 2.5–4 mm long; receptacle subglobose to subellipsoid, 1.4–1.5 cm diam. when dry, 2–2.2 cm diam. when fresh, glabrous, without lateral bracts, towards the apex 5- or 6-ribbed, yellow-brown at maturity, apex ± convex, ostiole c. 3 mm diam., surrounded by 5 or 6 raised apical bracts; internal hairs abundant, brownish.

Distribution — *Malesia*: Borneo (northern).

Habitat — Streamside forest, at altitudes between 900 and 1200 m.

Note — Some features, as the indumentum, the pale lower surface of dried leaves, and the ± revolute leaf margin suggest that this species is closely related to *F. treubii*. *Ficus virescens* is clearly distinct in the long petioles and the basically spirally arranged leaves. Moreover, indications that this species could be facultatively flagelliflorous are absent.

101. Ficus vrieseana Miq.

Ficus vrieseana Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 234, 296; King, Sp. Ficus 2 (1888) 100, t. 124; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 198; Koord., Atlas Baumart. Java 4 (1918) t. 760–763; Backer & Bakh.f., Fl. Java 2 (1965) 28; Corner, Gard. Bull. Singapore 21 (1965) 87; Kochummen, Tree Fl. Malaya 3 (1978) 161.

?*Ficus serraria* Miq. var. *membranacea* Miq., Fl. Ind. Bat., Suppl. (1861) 428.

Covellia rufescens Kurz ex Teijsm. & Binn., Natuurk. Tijdschr. Ned.-Indië 27 (1864) 28, non *F. rufescens* Vahl, 1805.

Ficus brachiata King, Sp. Ficus 2 (1888) 106, t. 136.

Ficus chamaecarpa Ridl., Kew Bull. (1926) 82; Corner, J. Malayan Branch Roy. Asiat. Soc. 11 (1933) 22, f. 10, 11. — *Ficus vrieseana* Miq. var. *chamaecarpa* (Ridl.) Corner, Gard. Bull. Singapore 18 (1960) 50.

Ficus vrieseana Miq. forma *appressipilosa* Corner, Gard. Bull. Singapore 18 (1960) 50.

Ficus vrieseana Miq. forma *obliqua* Corner, Gard. Bull. Singapore 18 (1960) 50.

Tree up to 15 m tall. *Leafy twigs* 2–5 mm thick, brown hirtellous or strigose, the longer hairs intermixed with (very) sparse white short and softer hairs, with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* (sub)distichous to spirally arranged (or subopposite); lamina oblong to subobovate, 8–30 by 3.5–12 cm, ± asymmetric, chartaceous, apex acuminate, base cuneate to subcordate at the broad side, cuneate to obtuse at the narrow side, margin denticulate to dentate; upper surface hirtellous to hispidulous, ± scabrous, lower surface brown hirtellous to strigillose on the veins, the longer hairs intermixed with (very) sparse white short and softer hairs, smooth, cystoliths only beneath (or sometimes also above?); lateral veins 6–11 pairs, often furcate far from the margin, tertiary venation scalariform; waxy glands in the axils of some lateral veins in the middle part of the lamina; petiole 0.5–2 cm long, brownish puberulous to strigillose, the longer hairs intermixed with (very) sparse white short and softer hairs, the epidermis persistent; stipules 0.5–1.5(–2.5) cm long, brown puberulous to hirtellous to substrigose, caducous (or subpersistent). *Figs* flagelliflorous on branched, up to 3(–8) m long stolons with up to 12 cm long internodes; peduncle 0.2–0.8 cm long; basal bracts 3, verticillate, 2–4 mm long, patent to slightly deflexed; receptacle subglobose to obovoid to subpyriform, 0.8–1.2 cm diam. when dry, c. 2.5 (?) cm diam. when fresh, brownish puberulous, glabrescent, 5-ribbed, without lateral bracts, colour at maturity unknown, apex convex; ostiole 3–7 mm diam., surrounded by 5 apical bracts, prominent; internal hairs abundant, white to brown.

Distribution — *Malesia*: Sumatra (incl. Mentawei Islands), Java.

Habitat — In forest and secondary growth, at low altitudes.

Notes — 1. *M. Shah 1610* (from Malaya, Penang) referred by Corner to *F. vrieseana* var. *chamaecarpa*, has not been included in the description. It differs from the collections from Java and Sumatra in the pronouncedly asymmetric base of the lamina and the dense dark brown, apparently persistent hairs on the figs. It resembles some Malayan specimens referred to *F. uncinata*, but the figs lack the lateral bracts. Additional material is needed to verify the identity of these Malayan collections.

2. According to Corner (ms.) this species may have cystoliths also on the upper surface of the lamina, but they have not been detected in the material available for the present treatment.

Section Sycocarpus subsection Macrostyla

Ficus L. subg. *Sycomorus* (Gasp.) Miq. sect. *Sycocarpus* Miq. subsect. *Macrostyla* Corner, Gard. Bull Singapore 18 (1960) 39; Philos. Trans., Ser. B, 281 (1978) 400.

Shrubs, obligatory rheophytes with rooting stolon-like stems and ascending or erect leafy branches, with the lower internodes long and the upper ones short; the strig(ill)ose indumentum partly dark brown to blackish. *Leaves* spirally arranged or (sub)opposite; lamina symmetric; cystoliths only beneath; waxy glands in the axils of lateral veins in the middle of the lamina. *Figs* axillary, cauliflorous or flagelliflorous; basal bracts 3 and verticillate or scattered, or indistinct, lateral bracts present; internal hairs absent or present and short and sparse. *Staminate flowers* subtended by 2 (connate) bracteoles; stamen 1. *Perianth* of pistillate flowers minute (or absent); styles of long-styled flowers long (8–15 mm long) with deflexed hairs; ovary and fruit laterally with deflexed hairs;

ovary of the short-styled flower glabrous or unilaterally minutely hairy, the style short and glabrous. *Fruits* lenticular, slightly keeled, smooth, brownish.

Distribution — Two species, *F. macrophylla* in northern Borneo and *F. squamosa* in the Sino-Himalayan region.

Note — The peculiar features of the long-styled flowers subsection can be regarded as adaptations to anchor the diaspores to the substrate.

102. Ficus macrostyla Corner

Ficus macrostyla Corner, Gard. Bull. Singapore 18 (1960) 43; 21 (1965) 85; Philos. Trans., Ser. B, 281 (1978) 402, t. 20.

Shrub up to 1 m high, with rooting stolon-like stems and ascending or erect leafy branches. *Leafy twigs* 2–5 mm thick, dark brown to blackish strigose; periderm persistent. *Leaves* spirally arranged, sometimes subopposite, ± tufted; lamina oblanceolate, (3–)6–18 by (1.2–)2–4 cm, symmetric, (sub)coriaceous, apex subacuminate to acute, base cuneate to subattenuate, the margin entire or denticulate towards the apex, often ± involute; upper surface dark brown or whitish strigose mostly only on the midrib, lower surface dark brown strigose on the midrib and the margin, often sparsely so on the lateral veins; cystoliths only beneath; lateral veins 8–12 pairs, not distinctly loop-connected, the basal pair not distinct, tertiary venation scalariform; waxy glands small, in the axils of the lateral veins in the middle part of the lamina; petiole 0.8–3.5(–7.5) cm long, dark brown strigose, the epidermis persistent; stipules (0.5–)1–1.5 cm long, with cuspidate apex, brown puberulous and dark brown strigose on the midrib, subpersistent or caducous. *Figs* axillary, solitary on the leaf axils or cauliflorous to flagelliflorous on leafless trailing branchlets, sessile; without distinct basal bracts; receptacle subovoid, 2–2.5 cm diam. when dry, with numerous lateral bracts, these lanceolate to broadly triangular, 0.2–1.5 cm long, dark brown strigose, blackish (?) at maturity, apex convex, ostiole c. 2 mm diam., surrounded and hidden by the upper lateral bracts; internal hairs few, short, brown. *Styles* 6–15 mm long, with deflexed hairs (also on the edges of the compressed ovary).

Distribution — *Malesia*: Borneo (Sarawak and Kalimantan: Bukit Raya).

Habitat — As a rheophyte in river beds, on rocks; at low altitudes.

Note — The long styles fill the fig cavity.

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FICUS subgenus SYNOECIA

Ficus L. subg. *Synoecia* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 289. — *Synoecia* Miq., London J. Bot. 7 (1848) 469; Fl. Ind. Bat. 1, 2 (1859) 328.

Root-climbers, with climbing stems and branches, with short roots on the nodes and internodes, and often non-rooting branches, bearing the figs. *Leaves* on rooting branches (bathyphylls) in size, shape and texture mostly different from those on non-rooting (and fertile) branches (acrophylls), or sometimes with transitional features, the leaves alternate, mostly distichous, sometimes in lax spirals; lamina with the margin entire and often cili(ol)ate, the acumen commonly with a hydathode-like structure, often in a small notch, tertiary venation scalariform to reticulate; waxy glands in the axils of both basal lateral veins, or in an asymmetric lamina only in one of them, often also smaller glands in the axils of other lateral branches and in axils and furcations of lateral veins, the epidermis of the petioles mostly flaking off; stipules fully amplexicaul, free, on climbing branches usually (sub)persistent. *Figs* axillary, in pairs, solitary or clustered (in minute spurs), ramiflorous on short spurs, or cauliflorous on longer spurs; basal bracts 3, verticillate; receptacles small to very large, often stipitate, without lateral bracts; ostiole relatively small, often ± sunken; internal bristles present or absent. *Staminate* and *neuter flowers* scattered among the pistillate ones or near the ostiole. *Stamens* 1, 2 (or 3), apiculate or not; tepals 0–7, often 3 or 4, glabrous, mostly (dark) red. *Ovaries* often stipitate, those of the long-styled flowers whitish to yellowish, those of the short-styled flowers (dark) red-brown or white to yellowish. *Stigmas* of long-styled flowers 2 (often unequally long) or 1, subulate, those of the short-styled flowers truncate (or subpeltate). *Fruits* yellowish, usually ± compressed and keeled all around.

DISTRIBUTION

The subgenus comprises c. 72 species, of which 61 occur in Malesia. *Ficus nasuta* Summerh. is endemic tot the Solomon Islands and *F. diversiformis* Miq. to Sri Lanka, and c. 10 species are elements of the Sino-Himalayan region. Two essentially Sino-Himalayan species, *F. laevis* and *F. pubigera*, extend into the Malesian region. The majority of the 61 found in Malesia are confined to this region. Seven of them extend outside the region, either to the Micronesia, the Solomon Islands and/or N Australia or to the Asian mainland; the most widespread of them are *F. disticha* (ranging from Myanmar to the Solomon Islands) and *F. sagittata* (ranging from the Andaman Islands to the Carolines). Borneo with 25 species mainly in its northern part and New Guinea with 26 species mainly in its eastern part are clearly centres of the subgenus. The majority of the Bornean species belong to sect. *Kissosycea* and the majority of the New Guinean ones to sect. *Rhizocladus*. About 2/3 of the species are lowland species, the others are montane or submontane, or a few occurring at both high and low elevations.

MORPHOLOGY

Habit — The subgenus is characterized by the habit described above and resembling that of Ivy (*Hedera helix*, Araliaceae). However, bathyphylls can be ill-defined, as in *F. laevis*. They may be totally absent, as in *F. spiralis*. True acrophylls may usually not develop or transitional features may be dominant, as in representatives of the *F. punctata*-group. Bathyphylls are usually smaller and thinner than acrophylls, the indumentum often consists of smaller hairs, and may be asymmetric in contrast to (true) acrophylls. Asymmetric bathyphylls are found in (all or most) members of sect. *Kissosycea* and in *F. pumila,* whereas they are (always?) symmetric in the other members of the subgenus. Some of the variation of material in the acrophyll-state can be related to the retainment of features of the bathyphyll-state. Not only the asymmetric laminas can be explained by retainment of traits of the bathyphyll state, but also some of the variation in the indumentum, as that consisting (predominantly) of stiff and straight hairs and that consisting (predominantly) of soft and crinkled hairs, a type of hairs usually present in the bathyphyll-state. Features of the bathyphylls are not included in the present descriptions of the species. Herbarium material with bathyphylls is frequently lacking or it cannot be related (with certainty) to fertile material. On branches with bathyphylls, the stipules are mostly (sub)persistent, whereas usually caducous on those with acrophylls, and they can be basally connate. Thick climbing stems or branches are often quadrangular and smaller ones often ± compressed. Roots are often also found on branches with acrophylls, apparently when they get in touch with the 'substrate'.

Indumentum — The longer hairs are mostly septate. They are not septate in *F. allutacea*, *F. araneosa*, *F. disticha*, and *F. floccifera*. The submicroscopic pluricellular trichomes (gland hairs) are mostly peltate, but they are globose-capitate in *F. laevis*, which also differs from other species of the subgenus in the absence of a hypodermis.

Leaves — The leaves are usually distichous, but sometimes arranged in lax spirals, at least on branches with acrophylls. The lamina is symmetric in the true acrophyll-state, but they can be clearly asymmetric or only so at the base, apparently due to retainment of characters of the bathyphyll-state. The lamina usually has a hydathode-like structure at the top of the acumen, often in a minute notch. The margin is entire and mostly ciliolate. In several species the lower surface is foveolate, however, in different ways. In the *F. punctata*-group of sect. *Kissosycea*, the areoles (stomatal pits) are surrounded by flat, in dry material pale-coloured tissue, (largely of the veinlets), and the rims bear minute hairs. The stomatal pits are brownish when dry. In the *F. excavata*-subgroup, the stomatal pits are small and surrounded by low rims without contrasting colour and without hairs on the rims. This type of stomatal pits is associated with minutely bullate areoles. In *F. pumila* (and the related Asian mainland species *F. sarmentosa* Buch.-Ham. ex Sm. p.p.), the areoles are surrounded by very prominent veinlets, and the stomatal pits ± deeply sunken, but in *F. sarmentosa* (p.p.) the foveolate lower surface of the lamina may also resemble that of species of the *F. punctata*-group. In other species of sect. *Kissosycea*, the lower surface of the lamina is tessellate, when dry with large brownish-coloured areoles surrounded by pale-coloured tissue. In the *F. punctata*-group, tes-

sellate laminas represent apparently a state transitional between the bathyphylls and the acrophylls with a foveolate lower surface. Laminas without marked areoles, tessellate ones and foveolate ones can be found in the same collection (*F. barba-jovis*). Faintly tessellate lower surfaces may occur in some species of sect. *Rhizocladus*.

The epidermis of the petioles is flaking off in most species.

Figs — The figs are axially and basically borne in pairs. They may occur clustered on small spurs (up to c. 0.5 cm long), often developing already in the leaf axils and continue to bear figs on the older wood (ramiflorous or sometimes even cauliflorous). If the figs are small, these spurs usually bear more than two figs, if the figs are medium-sized or large, they usually bear not more than two figs. In the *F. punctata*-group, the figs are often cauliflorous or ramiflorous and born on longer (mostly up to some centimetres long) spurs and solitary.

The figs vary considerably in dimensions, from 0.2–0.3 cm (*F. excavata*) to c. 10 cm (*F. punctata, F. scratchleyana*) in diameter, the large ones often cauliflorous, sometimes (as in *F. hypophaea*, *F. pumila*, and *F. scratchleyana*) born axillary or just below the leaves. Like in other groups of *Ficus*, the dimensions of figs can vary considerably within species. The fig receptacle is often stipitate.

Flowers — The staminate and neuter flowers are disperse in the majority of the species, ostiolar in a smaller number.

Neuter and staminate flowers are very abundant in large figs of the *F. punctata*-group. They have long pedicels and the perianths occur at the same level as the stigmas. Intermixture of these perianths and stigmas prevents that the stigmas form a continuous layer as can be commonly found in small figs (of the same group) with shorter neuter flowers. In the species with numerous staminate and neuter flowers, the perianths of these flowers form the coherent (almost closed) surface from where the pollinators oviposit. In *F. laevis* and *F. pubigera* the long interfloral bristles separate the stigmas and their tips form with the stigmas the closed surface.

The number of staminate flowers can also be high in species with ostiolar staminate flowers (e.g., in *F. jacobsii* and *F. pumila*).

Neuter flowers are sometimes absent (*F. apiocarpa*) as are short-styled flowers and then only staminate flowers are present in the inflorescence.

In the *F. apiocarpa*-group (of sect. *Kissosycea*) the staminate flowers are disperse in some species and subspecies and ostiolar in others: *F. disticha* var. *calodictya*, *F. distichoidea*, and *F. phatnophylla*.

The tepals are mostly red, often dark red; they are always or often pink or sometimes yellowish to whitish in subsect. *Trichocarpeae*. The tepals are sometimes indurated (*F. bakeri*).

Flowers in large figs can be up to 1 cm long (e.g., in *F. odoardii*) or may have long pedicels (e.g., in *F. punctata*).

Fruits — The fruits are usually compressed with a keel all around, but in some species (as *F. gymnorygma*, *F. pubigera*, and *F. scratchleyana*) the fruit is not compressed and the keel is lacking or faintly developed.

Anatomy — Two main types of hairs can be distinguished: weak and more or less crinkled hairs, which may form a floccose indumentum, and stiff hairs, which are often septate and often have ± swollen bases. In some species the stiff hairs are irritant; they easily break off from the swollen bases and are not septate. The (mostly brown) pluricellular hairs are mostly peltate, but are oblongoid-capitate in subsect. *Rhizocladus* and subsect. *Pogonotrophe*. A hypodermis is lacking in the latter subsection.

SYSTEMATICS

Systematic position — The subgenus is clear-cut and rather uniform. It is mainly defined by its habit, including heterophylly and predominantly distichously arranged leaves.

The presence of neuter flowers and the bifid stigmas in the long-styled flowers and the absence of lateral bracts on the fig receptacle relate this subgenus clearly to subg. *Ficus*.

It can be distinguished from subg. *Ficus* primarily by the habit, in particular the predominantly distichously arranged leaves, and in addition, by features such as entire margins of the lamina, the epidermis of the petiole which is flaking off in most species, the presence of tessellate or foveolate lower surfaces of the laminas (in many species), caducous basal bracts (in many species), the stipitate fig receptacles (in many species), small ostioles, and/or presence of ramiflory and cauliflory.

If indications about the habit are lacking, subg. *Synoecia* can be distinguished from subg. *Sycidium* in general by the fully amplexicaul stipules, the arrangement of basal bracts in whorls, the absence of lateral bracts on the fig receptacle, and by characters of the flowers and fruits, as the presence of neuter flowers, the absence of pistillodes in the staminate flowers, and the compressed fruits with a keel all around. However, some species of subg. *Synoecia* with asymmetric laminas resemble the climbers of subg. *Sycidium* sect. *Palaeomorphe,* not only by the adventitious roots on climbing stems, but also by unilateral waxy glands, but they can be distinguished by the foveolate or tessellate lower surfaces of the laminas and the large figs.

If indications about the habit are lacking, subg. *Synoecia* can be distinguished from subg. *Sycomorus* by the usually distichously arranged leaves, the entire margin of the lamina, the absence of subnodal glandular spots (except in *F. pubigera)* or from most members of sect. *Sycocarpus* by the waxy glands in the axils of the basal lateral veins. Moreover, by the small, often sunken ostioles, the absence of lateral bracts on the fig receptacle, the absence of pronounced cauliflory, in which more than one fig is born simultaneously on the fig-bearing leafless branchlets, the presence of neuter flowers and staminate flowers among the pistillate flowers, or if they occur near the ostiole, then by the absence of subtending bracteoles, and the bifid stigmas of long-styled pistillate flowers.

Classification — The species of root-climbers were placed in two sections of subg. *Ficus* (sensu Corner): sect. *Kalosyce* and sect. *Rhizocladus*. They are here united into a single entity: subg. *Synoecia* (in accordance with a suggestion by Corner (1960: 3). For the recognition of the two sections and their subdivision, characters of the staminate flowers, their position in the fig (disperse or ostiolar), the number of stamens (1 or 2),

and features of the anthers (long and mucronate or short and not mucronate) played an important role. For the current subdivision of the subgenus these characters still play a role, but also involving characters of vegetative parts led to a remodelling of the classification, in which the ranks of series and subseries have not been applied.

Subg. *Synoecia*
- Sect. *Kissosycea*
  - *Ficus apiocarpa*-group
  - *Ficus punctata*-group
- Sect. *Rhizocladus*
  - Subsect. *Plagiostigma*
  - Subsect. *Pogonotrophe*
  - Subsect. *Punctulifoliae*
    - *Ficus baeuerlenii*-group
    - *Ficus villosa*-group
      - *Ficus villosa*-subgroup
      - *Ficus excavata*-subgroup
  - Subsect. *Trichocarpeae*

POLLINATORS

The pollinators of the species of subg. *Synoecia* belong to the genus *Wiebesia* (Wiebes 1994: 99–116).

References: Corner, E.J.H., Taxonomic notes on Ficus Linn., Asia and Australasia. V. Subgen. Ficus sect. Rhizocladus, Kalosyce, Sinosycidium, Adenosperma, and Neomorphe. Gard. Bull. Singapore 18 (1960) 1–35. — Wiebes, J.T., The Indo-Australian Agaoninae (pollinators of figs). Verh. Kon. Ned. Akad. Wet., afd. Natk., 2de reeks, 92 (1994) 1–208.

KEY TO THE SECTIONS AND SUBSECTIONS

1a. Anthers short, elliptic to oblong in outline, not mucronate; lamina (of acrophylls) often slightly asymmetric, foveolate or tessellate beneath; stamens 1 (or 2) . . . . . Sect. **Kissosycea**

b. Anthers long, lanceolate to oblong in outline, mucronate; lamina (of acrophylls) usually asymmetric, only in some species foveolate beneath; stamens 2 (or 3) . 2

2a. Waxy glands on the nodes of leafy twigs; leaves not clearly dimorphic (bathyphylls and acrophylls) . . . . . Subsect. **Pogonotrophe**

b. Waxy glands absent on the leafy twigs; leaves dimorphic (bathyphylls and acrophylls) 3

3a. Staminate flowers scattered among the pistillate ones . . Subsect. **Trichocarpeae**

b. Staminate flowers near the ostiole 4

4a. Stamens free; figs axillary, solitary; hairs without swollen bases . . . . . Subsect. **Plagiostigma**

b. Stamens basally connate; figs often clustered on short spurs (ramiflorous) or axillary and usually in pairs, hairs (all or some) with swollen bases . . . . . Subsect. **Punctulifoliae**

KEY TO THE SPECIES

1a. Leafy twigs with pairs of subnodal waxy glands below (the scars of) the petioles. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **29. F. laevis**
b. Leafy twigs without waxy glands 2
2a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated . . . . . **28. F. pumila**
b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 3
3a. Lower surface of the lamina foveolate (the areoles surrounded by a rim) or tessellate (the areoles brownish when dry, usually surrounded by paler coloured tissue) 4
b. Lower surface of the lamina neither foveolate nor clearly tessellate 38
4a. Lower surface of the lamina foveolate 5
b. Lower surface of the lamina tessellate 26
5a. Lamina scabrous above 6
b. Lamina smooth above 7
6a. Petiole 0.5–1.5 cm long; lamina 4–11 cm long. — Java . . . **24. F. trachycoma**
b. Petiole 1.5–3 cm long; lamina 10–21 cm long. — Borneo . . . **25. F. tulipifera**
7a. Petiole 0.2–1 cm long; stipules 0.3–1 cm long; lamina often shorter than 10 cm 8
b. Petiole 1–4 or 4–13 cm long; stipules (0.5–)1–2(–4.5) cm long and/or the lamina (mostly) longer than 10 cm 15
8a. Lamina asymmetric with 1 waxy gland in the axil of the basal lateral vein at the broad side of the lamina 9
b. Lamina symmetric (or slightly asymmetric at the base) with waxy glands in the axils of both basal lateral veins or absent 10
9a. Main veins of the lamina impressed above; internal hairs absent. — Sumatra, Malay Peninsula, Borneo . . . . . **18. F. ruginervia**
b. Main veins of the lamina almost flat to slightly prominent, or the midrib slightly impressed above; internal hairs abundant. — Widespread . . . . .**17. F. punctata**
10a. Figs axillary in pairs or clustered (also on the older wood), the receptacle 0.2–0.6 cm diam. when dry; areoles without indumentum on the rims 11
b. Figs cauliflorous, the receptacle 1–10 cm diam. when dry, areoles mostly with minute hairs on the rims 12
11a. Indumentum of leafy twigs pale brown to greyish; lamina 3–11 cm long; fig receptacle 0.4–0.6 cm diam. when dry. — Sumatra, Malay Peninsula . . . . . **31. F. araneosa**
b. Indumentum of leafy twigs brown(ish); lamina 1–4.5 cm long; fig receptacle 0.2–0.3 cm diam. when dry. — Sumatra, Malay Peninsula . . . **36. F. excavata**
12a. Lateral veins 3–6(–7) pairs 13
b. Lateral veins 6–10 pairs 14
13a. Fig receptacle (1.5–)3–5(–10) cm diam. when dry, the basal bracts 3–5 mm long; apex of the lamina minutely retuse. — Widespread . . . . . .**17. F. punctata**

b. Fig receptacle 1–2 cm diam. when dry, the basal bracts 2–3 mm long; apex of the lamina not retuse. — Philippines . . . . . **5. F. cataupi**

14a. Basal lateral veins up to 1/6–1/4 the length of the lamina, (faintly) branched; fig receptacle ellipsoid, the basal bracts 4–6 mm long. — Borneo **3. F. barba-jovis**

b. Basal lateral veins up to 1/10–1/6 the length of the lamina, unbranched; fig receptacle depressed-globose, the basal bracts 1.5–2.5 mm long. — Borneo . . . . . **6. F. cavernicola**

15a. Figs axillary or just below the leaves, often clustered, the receptacle 0.4–0.8 cm diam. when dry; rims of the areoles without hairs 16

b. Figs mostly cauliflorous and/or the receptacle more than 1 cm diam. when dry, or if axillary and less than 1 cm diam. when dry, then the rims of the areoles with hairs (and occurring in New Guinea) 17

16a. Basal lateral veins of the lamina up to 1/5–1/3 the length of the lamina; basal bracts (sub)persistent. —Borneo . . . . . **53. F. supperforata**

b. Basal lateral veins of the lamina up to 1/3–1/2 the length of the lamina; basal bracts caducous. — Sumatra, Java, Borneo . . . . . **42. F. lanata**

17a. Petiole (3–)4–13 cm long and stipules 1.5–5 cm long; figs cauliflorous. — Borneo . . . . . **7. F. densechini**

b. Petiole 1–4 cm long, if up to 5 cm long, then the stipules 1–1.5 cm long, or if up to 10 cm long, then the figs not cauliflorous 18

18a. Lamina glabrous on the veins beneath 19

b. Lamina hairy on the veins beneath, often only sparsely so 21

19a. Lateral veins 3–6 pairs; lamina 2–12 cm long. — Widespread **17. F. punctata**

b. Lateral veins 6–10 pairs; lamina mostly longer than 10 cm 20

20a. Midrib of the lamina slightly prominent to flat above; figs cauliflorous. — Borneo . . . . . **13. F. grandiflora**

b. Midrib of the lamina ± impressed above; figs axillary. — New Guinea . . . . . **20. F. scratchleyana**

21a. Lateral veins 3–6 pairs, the midrib slightly prominent above. — Widespread . . . . . **17. F. punctata**

b. Lateral veins 6–12 pairs, the midrib often ± impressed above 22

22a. Figs axillary. — New Guinea . . . . . **14. F. gymnorygma**

b. Figs cauliflorous 23

23a. Stipules on the leafy twigs 0.5–1 cm long 24

b. Stipules on the leafy twigs 1–1.8 cm long 25

24a. Venation of the lamina ± impressed above. — Borneo . . . . **19. F. sarawakensis**

b. Venation flat or the midrib (at least its upper part) slightly prominent above. — Borneo . . . . . **25. F. tulipifera**

25a. Lamina 9–21 cm long, ± asymmetric, at least at the base; fig receptacle brown velutinous. — Borneo . . . . . **4. F. carrii**

b. Lamina 7–12 cm long, (almost) symmetric; fig receptacle glabrous. — Sumatra . . . . . **21. F. singalana**

26a. Lamina ± asymmetric 27

b. Lamina (almost) symmetric 28

27a. Lamina 4–9 cm long; petiole 0.5–1.5(–2) cm long; fig receptacle c. 1 cm diam. when dry. — Borneo . . . . . **9. F. diandra**
b. Lamina 1–3.5 cm long; petiole 0.3–0.6(–0.8) cm long; fig receptacle 0.2–0.3 cm diam. when dry. — Widespread . . . . . **10 F. disticha**
28a. Lamina usually 10–20(–30) cm long, the petiole 1–7.5 cm long, the stipules mostly longer than 1 cm, and/or the tertiary venation mostly (sub)scalariform 29
b. Lamina usually less than 10 cm long, the petiole and/or the stipules mostly up to 1 cm, and the tertiary venation distinctly reticulate 33
29a. Lateral veins 10–14 pairs, the basal pair up to 1/10 the length of the lamina. — Philippines . . . . . **22. F. sohotonensis**
b. Lateral veins (3–)4–10 pairs, the basal pair well-developed, more than up to 1/10 the length of the lamina 30
30a. Fig receptacle 0.6–1 cm diam. when dry. — Widespread . . . . . **1. F. allutacea**
b. Fig receptacle 1.5–2.5 cm diam. when dry 31
31a. Lateral veins 8–10 pairs, the basal pair 1/10–1/5 the length of the lamina; fig receptacle densely brownish hairy, the apex distinctly protracted. — Celebes . . . . . **23. F. submontana**
b. Lateral veins (3–)4–8 pairs, the basal pair (1/5–)1/4–1/2(–2/4) the length of the lamina; fig receptacle sparsely and/or minutely white puberulous or glabrous, the apex slightly umbonate or the ostiole 32
32a. Lateral veins (3–)4–6 pairs, the basal pair 1/3–1/2(–3/4) the length of the lamina, distinctly branched. — Sumatra, Malay Peninsula, Borneo . . . . . **2. F. apiocarpa**
b. Lateral veins 6–8 pairs, the basal pair (1/5–)1/4–1/3 the length of the lamina, unbranched or faintly branched. — Philippines . . . . . **15. F. peninsula**
33a. Peduncle 1–1.3 cm long; apex of lamina subacuminate acute; lamina 7–9 cm long. — Borneo (northern) . . . . . **12. F. gamostyla**
b. Peduncle 0–0.4 cm long; apex of lamina rounded to shortly and bluntly acuminate, or if subacute then the lamina usually 1–5 cm long 34
34a. Acumen of the lamina shortly mucronate. — New Guinea . **16. F. phatnophylla**
b. Acumen (or apex) of the lamina minutely retuse 35
35a. Fig receptacle 0.3–0.6(–0.8) cm diam. when dry, the basal bracts usually caducous; lamina often broadest above or below the middle. — Widespread **10. F. disticha**
b. Fig receptacle 0.7–1.2(–1.5) cm diam. when dry, the basal bracts mostly persistent; lamina broadest in the middle 36
36a. Basal lateral veins up to 1/4–1/3 the length of the lamina; basal bracts 1.5–3 mm long. — New Guinea . . . . . **11. F. distichoidea**
b. Basal lateral veins up to 1/10–1/3 the length of the lamina; basal bracts c. 1.5 mm long 37
37a. Petiole 1.5–2.5 mm thick; margin of the lamina distinctly revolute. — Borneo . . . . . **8. F. detonsa**
b. Petiole 1–1.5 mm thick; margin of the lamina slightly revolute towards the base. — Philippines . . . . . **26. F. warburgii**
38a. Indumentum partly consisting of uncinate hairs. — Widespread **48. F. recurva**

b. Indumentum without uncinate hairs 39
39a. Basal bracts persistent 40
b. Basal bracts caducous 63
40a. Lateral veins 10–16 pairs 41
b. Lateral veins 3–10 pairs 42
41a. Fig receptacle 0.4–0.5 cm diam. when dry; figs mostly clustered. — Borneo . . . . . **52. F. spiralis**
b. Fig receptacle 1–3 cm diam. when dry; figs mostly solitary. — Malay Peninsula . . . . . **27. F. pubigera**
42a. Lamina ± scabrous above 43
b. Lamina smooth above 44
43a. Basal lateral veins c. 1/2–2/3 the length of the lamina; indumentum of the lower surface of the lamina brown. — Widespread . . . . . **63. F. trichocarpa**
b. Basal lateral veins up to c. 1/2 the length of the lamina; indumentum of lower surface of the lamina dark brown. — Philippines . . . . . **59. F. perfulva**
44a. Lamina ± scabrous beneath by very sparse and/or minute (cystolith) hairs. — Borneo . . . . . **49. F. sabahana**
b. Lamina smooth beneath, or if scabridulous, then distinctly hairy 45
45a. Lamina glabrous . . . . . 46 (*see also 26–37*)
b. Lamina hairy, at least beneath, at least sparsely so on the midrib . . . . . 48 (*see also 26–37*)
46a. Basal lateral veins up to c. 1/2 the length of the lamina; lamina mostly 10–20 cm long; fig receptacle 1.2–2.5 cm diam. when dry. — New Guinea . . . . . **58. F. jimiensis**
b. Basal lateral veins 1/8–1/4 the length of the lamina; lamina usually up to 10 cm long; fig receptacle 0.3–0.8 cm diam. when dry 47
47a. Acumen minutely retuse; fig receptacle 0.6–0.8 cm diam. when dry. — Borneo . . . . . **8. F. detonsa**
b. Acumen shortly mucronate; fig receptacle 0.3–0.4 cm diam. when dry. — New Guinea . . . . . **16. F. phatnophylla**
48a. Tertiary venation scalariform; lamina usually or often longer than 10 cm, occasionally less than 5 cm long 49
b. Tertiary venation reticulate or to subscalariform (with few, ± irregular, transverse (and parallel) tertiary veins, in particular in relatively large leaves); lamina always or often less than 10 cm long, often less than 5 cm long and with 3–6 pairs of lateral veins, or, if usually longer than 10 cm, then with 8–12 pairs of lateral veins 58
49a. Lateral veins 6–10 pairs 50
b. Lateral veins 3–6 pairs 51
50a. Lateral veins and smaller veins of the lamina prominent beneath; hairs on the lamina often ± patent. — Widespread . . . . . **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; hairs on the lamina appressed. — Widespread . . . . . **51. F. sagittata**
51a. Fig receptacle 0.4–1 cm diam. when dry 52
b. Fig receptacle 1–2.5 cm diam. when dry 55

52a. Basal bracts 3–6 mm long. — New Guinea . . . . . **62. F. supfiana**
b. Basal bracts 0.5–2 mm long 53
53a. Figs (sub)sessile, the receptacle glabrous. — Widespread . . . . . **48e. F. recurva** var. **urnigera**
b. Figs 0.2–0.5 cm long, pedunculate, the receptacle hairy 54
54a. Lower surface of the lamina densely hairy with dark brown hairs; leafy twigs 2–3 mm thick; fig receptacle 0.7–1 cm diam. when dry. — Philippines . . . . . **59. F. perfulva**
b. Lower surface of the lamina usually ± sparsely hairy with pale brown hairs; leafy twigs 1–2 mm thick; fig receptacle 0.4–0.6 cm diam. when dry. — Philippines . . . . . **55. F. bakeri**
55a. Basal bracts 1–2 mm long 56
b. Basal bracts 3–7(–10) cm long 57
56a. Lamina sparsely hairy or glabrous beneath, flat above. — Sumatra, Malay Peninsula, Borneo . . . . . **2. F. apiocarpa**
b. Lamina densely hairy beneath, bullate above. — New Guinea . . . . . **60. F. phaeobullata**
57a. Basal lateral veins up to c. 1/2(–2/3) the length of the lamina; lamina sparsely hairy beneath. — New Guinea . . . . . **62. F. supfiana**
b. Basal lateral veins 2/3–3/4 the length of the lamina; lamina densely hairy beneath. — New Guinea . . . . . **57. F. hypophaea**
58a. Figs (sub)sessile 59
b. Figs pedunculate 62
59a. Lateral veins 8–12 pairs. — Malay Peninsula . . . . . **27. F. pubigera**
b. Lateral veins 3–7 pairs 60
60a. Leafy twigs pale brown to greyish floccose-tomentose; figs in pairs or often clustered in the leaf axils and below the leaves. — Sumatra, Malay Peninsula . . . . . **31. F. araneosa**
b. Leafy twigs brown tomentose to subvillous; figs axillary, solitary (or in pairs) 61
61a. Epidermis of the petiole flaking off; lower surface of the lamina hairy on the main veins; fig receptacle globose to ovoid. — New Guinea . . . . . **44. F. ovatacuta**
b. Epidermis of the petiole persistent; lower surface of the lamina hairy also on the smaller veins; fig receptacle ellipsoid. — New Guinea . . . . **34. F. colobocarpa**
62a. Lamina sparsely puberulous to subtomentose beneath; basal bracts 1–2 mm long. — New Guinea . . . . . **61. F. pleiadenia**
b. Lamina densely floccose-tomentose beneath; basal bracts c. 3 mm long. — New Guinea . . . . . **56. F. cinnamomea**
63a. Lamina ± scabrous beneath, with very sparse and/or minute (cystolith) hairs. — Borneo . . . . . **49. F. sabahana**
b. Lamina smooth beneath, or if scabridulous, then distinctly hairy 64
64a. Tertiary venation scalariform; lamina usually or often longer than 10 cm, occasionally less than 5 cm long 65
b. Tertiary venation reticulate or to subscalariform (with few, ± irregular, transverse (parallel) tertiary veins), in particular, in relatively large leaves; lamina always or often less than 10 cm long, often less than 5 cm long 81

65a. Figs on spurs below the leaves (but already developing in the leaf axils), if the figs small, then often clustered, or if large, then often in pairs or solitary . . . 66
b. Figs in pairs or solitary in the leaf axils or just below the leaves 72
66a. Basal bracts 2–7 mm long; fig receptacle usually 1.2–3.5 cm diam.; figs solitary or in pairs (axillary and on spurs) 67
b. Basal bracts 0.5–2 mm long; figs usually 0.5–1.2 cm diam. when dry; figs often in clusters of more than 2 (axillary and on spurs) 68
67a. Fig receptacle glabrous; indumentum without irritant hairs. — New Guinea . . . . . **33. F. camptandra**
b. Fig receptacle hairy; indumentum partly with irritant hairs. — Moluccas, New Guinea . . . . . **43. F. odoardii**
68a. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat beneath, the areoles smooth; hairs on the lamina appressed 69
b. Lateral veins and smaller veins of the lamina prominent beneath, the areoles often minutely bullate; hairs on the lamina often ± patent 70
69a. Lateral veins 6–10 pairs; fig receptacle usually 0.5–1 cm diam. when dry. — Widespread . . . . . **51. F. sagittata**
b. Lateral veins 3–6 pairs; fig receptacle 0.3–0.5 cm diam. when dry. — Widespread . . . . . **48e. F. recurva** var. **urnigera**
70a. Lateral veins 6–10 pairs. — Widespread . . . . . **54. F. villosa**
b. Lateral veins 4–6(–7) pairs 71
71a. Hairs on the midrib of the lamina beneath appressed or patent, rarely tending to retrorse. — Sumatra, Java, Borneo . . . . . **42. F. lanata**
b. Hairs on the midrib of the lamina beneath ± retrorse. — Philippines . . . . . **54. F. villosa**
72a. Fig receptacle (usually) 1.2–3.5(–5) cm diam. when dry 73
b. Fig receptacle 0.3–1.2 cm diam. when dry 76
73a. Leafy twigs and lower surface of the lamina very sparsely and inconspicuously hairy. — New Guinea . . . . . **41. F. jacobsii**
b. Leafy twigs and/or the lamina beneath ± densely and conspicuously hairy . . 74
74a. Indumentum (in particular that of the fig receptacle) partly consisting of stiff and irritant hairs, which break off easily. — Moluccas, New Guinea . **43. F. odoardii**
b. Indumentum without irritant hairs 75
75a. Petiole (1–)2–3.5 cm long; stipules 0.5–0.8 cm long; receptacle non-stipitate; ostiole surrounded by a tuft of hairs. — New Guinea . . . . . **38. F. fuscata**
b. Petiole (0.5–)1–2 cm long; stipules (0.5–)1–2 cm long; receptacle stipitate; ostiole not surrounded by a tuft of hairs. — New Guinea . . . . . **32. F. baeuerlenii**
76a. Stipules 0.5–1 cm long 77
b. Stipules (0.5–)1–2.5 cm long 78
77a. Figs sessile, the receptacle non-stipitate; basal bracts 1.5–2 mm long. — New Guinea . . . . . **50. F. sageretina**
b. Figs (shortly) pedunculate, the receptacle stipitate; basal bracts 3–4 mm long. — New Guinea . . . . . **32. F. baeuerlenii**
78a. Indumentum of the fig receptacle short-velutinous (dense), the apex of the receptacle ± protracted. — New Guinea . . . . . **32. F. baeuerlenii**

b. Indumentum of the fig receptacle hirtellous, strigillose, or absent, the apex of the receptacle convex, flat, or slightly umbonate 79

79a. Lamina ± bullate above; indumentum partly consisting of irritant hairs which break off easily; basal bracts 3–7 mm long and free. — New Guinea . . . . . **40. F. insculpta**

b. Lamina flat above; indumentum without irritant hairs; basal bracts 2–2.5 mm long and free or 4–6 mm long and connate 80

80a. Basal lateral veins up to c. 1/3–1/2 the length of the lamina; basal bracts 2–2.5 mm long and free; receptacle sparsely puberulous and brown pulverulent. — New Guinea . . . . . **45. F. oxymitroides**

b. Basal lateral veins up to c. 1/5–1/3 the length of the lamina; basal bracts 4–6 mm long and connate; receptacle brown hirtellous. — Moluccas, New Guinea . . . . . **35. F. devestiens**

81a. Figs in clusters of more than 2 in the leaf axils and on short spurs below the leaves; fig receptacle 0.3–0.6 cm diam. when dry 82

b. Figs in pairs or solitary in the leaf axils or also on spurs on the older wood; fig receptacle (0.5–)0.6–1 cm diam. when dry. — New Guinea 84

82a. Leafy twigs sparsely (and minutely) hairy. — Widespread . . . . . **48e. F. recurva** var. **urnigera**

b. Leafy twigs densely hairy 83

83a. Stipules (0.3–)1–2 cm long; petiole brown hirtellous. — Sumatra, Malay Peninsula, Java . . . . . **47. F. pendens**

b. Stipules 0.5–0.8 cm long; petiole densely pale brown to greyish floccose-villous. — Sumatra, Malay Peninsula . . . . . **31. F. araneosa**

84a. Lamina ± scabrous above. — New Guinea . . . . . **30. F. ampulliformis**

b. Lamina smooth above 85

85a. Lamina glabrous beneath. — Celebes (?), Moluccas, New Guinea . . . . . **46. F. pantoniana**

b. Lamina hairy on the veins beneath 86

86a. Lamina brown floccose-tomentose beneath; lateral veins (5–)6–9 pairs, the basal pair up to 1/5–1/3 the length of the lamina. — New Guinea . . **37. F. floccifera**

b. Lamina brown (sub)strigillose beneath; lateral veins 4 or 5, the basal pair up to 1/3–1/2 the length of the lamina. — New Guinea . . . . . **39. F. hypobrunnea**

REGIONAL KEY: MALAY PENINSULA

1a. Leafy twigs with pairs of subnodal waxy glands below (the scars of) the petioles . . . . . **29. F. laevis**

b. Leafy twigs without waxy glands 2

2a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated . . . . . **28. F. pumila**

b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 3

3a. Lower surface of the lamina foveolate (the areoles surrounded by a rim) or tessellate (the areoles brownish when dry, usually surrounded by paler coloured tissue) 4
b. Lower surface of the lamina neither foveolate nor clearly tessellate 10
4a. Lower surface of the lamina foveolate 5
b. Lower surface of the lamina tessellate 8
5a. Lamina often asymmetric and waxy glands only in the axils of one of basal lateral veins; areoles without indumentum on the rims; figs usually cauliflorous, the receptacle 1–10 cm diam. when dry 6
b. Lamina usually symmetric and waxy glands in the axils of both basal lateral veins; figs axillary in pairs or clustered (also on the older wood), the receptacle 0.3–1 cm diam. when dry 7
6a. Main veins of the lamina impressed above; internal hairs absent . . . . . **18. F. ruginervia**
b. Main veins of the lamina almost flat to slightly prominent, or the midrib slightly impressed above; internal hairs abundant . . . . . **17. F. punctata**
7a. Indumentum of leafy twigs pale brown to greyish; lamina 3–11 cm long; fig receptacle 0.4–0.6 cm diam. when dry . . . . . **31. F. araneosa**
b. Indumentum of leafy twigs brown(ish); lamina 1–4.5 cm long; fig receptacle 0.2–0.3 cm diam. when dry . . . . . **36. F. excavata**
8a. Petiole 0.3–1(–2) cm long; lamina 1–5(–7.5) cm long; fig receptacle 0.3–0.6(–0.8) cm diam. when dry . . . . . **10. F. disticha**
b. Petiole 1–7.5 cm long; lamina 7–20(–30) cm long; fig receptacle 0.6–2.5 cm diam. when dry 9
9a. Basal pair of lateral veins up to 1/8–1/3 the length of the lamina; fig receptacle 0.6–1 cm diam. when dry . . . . . **1. F. allutacea**
b. Basal lateral veins up to 1/3–1/2(–2/3) the length of the lamina; fig receptacle 1.5–2.5 cm diam. when dry . . . . . **2. F. apiocarpa**
10a. Indumentum partly consisting of uncinate hairs . . . . . **48. F. recurva**
b. Indumentum without uncinate hairs 11
11a. Basal bracts persistent 12
b. Basal bracts caducous 17
12a. Tertiary venation scalariform; lamina usually or often longer than 10 cm, occasionally less than 5 cm long 13
b. Tertiary venation reticulate or to subscalariform (with few, ± irregular, transverse (and parallel) tertiary veins, in particular in relatively large leaves); lamina always or often less than 10 cm long, often less than 5 cm long and with 3–6 pairs of lateral veins, or, if usually longer than 10 cm, then with 8–12 pairs of lateral veins 16
13a. Lateral veins 6–10 pairs 14
b. Lateral veins 3–6 pairs 15
14a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent . . . . . **54. F. villosa**
b. Lateral veins slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed . . . . . **51. F. sagittata**

15a. Petiole 0.3–1.5 cm long; fig receptacle 0.4–1 cm diam. when dry . . . . . **48e. F. recurva** var. **urnigera**
b. Petiole 1.5–7.5 cm long; fig receptacle 1–2.5 cm diam. when dry . . . . . **2. F. apiocarpa**
16a. Lateral veins 8–12 pairs . . . . . **27. F. pubigera**
b. Lateral veins 3–7 pairs . . . . . **31. F. araneosa**
17a. Lateral veins 6–10 pairs 18
b. Lateral veins 3–6 pairs 19
18a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent . . . . . **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed . . . . . **51. F. sagittata**
19a. Leafy twigs sparsely (and minutely) hairy . . . . . **48e. F. recurva** var. **urnigera**
b. Leafy twigs densely hairy 20
20a. Stipules usually 1–2 cm long; petiole brown hirtellous . . . . . **47. F. pendens**
b. Stipules 0.5–0.8 cm long; petiole densely pale brown to greyish floccose-villous . . . . . **31. F. araneosa**

REGIONAL KEY: SUMATRA

1a. Leafy twigs with pairs of subnodal waxy glands below (the scars of) the petioles . . . . . **29. F. laevis**
b. Leafy twigs without waxy glands 2
2a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated . . . . . **28. F. pumila**
b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 3
3a. Lower surface of the lamina foveolate (the areoles surrounded by a rim) or tessellate (the areoles brownish when dry, usually surrounded by paler coloured tissue) 4
b. Lower surface of the lamina neither foveolate nor clearly tessellate 12
4a. Lower surface of the lamina foveolate 5
b. Lower surface of the lamina tessellate 10
5a. Figs usually cauliflorous, the receptacle 1–10 cm diam. when dry 6
b. Figs axillary in pairs or clustered (also on the older wood), the receptacle 0.2–0.6 cm diam. when dry 8
6a. Main veins of the lamina almost flat to slightly prominent, or the midrib slightly impressed above . . . . . **17. F. punctata**
b. Main veins of the lamina impressed above 7
7a. Stipules 1–1.8 cm long; lamina symmetric . . . . . **21. F. singalana**
b. Stipules 0.2–0.8 cm long; lamina ± asymmetric . . . . . **18. F. ruginervia**
8a. Tertiary venation scalariform; stipules usually 1–2 cm long . . . . **42. F. lanata**
b. Tertiary venation reticulate; stipules 0.2–0.8 cm long 9

9a. Indumentum of leafy twigs pale brown to greyish; lamina 3–11 cm long; fig receptacle 0.4–0.6 cm diam. when dry . . . . . **31. F. araneosa**
b. Indumentum of leafy twigs brown(ish); lamina 1–4.5 cm long; fig receptacle 0.2–0.3 cm diam. when dry . . . . . **36. F. excavata**
10a. Petiole 0.3–1(–2) cm long; lamina 1–5(–7.5) cm long; fig receptacle 0.3–0.6 (–0.8) cm diam. when dry . . . . . **10. F. disticha**
b. Petiole 1–7.5 cm long; lamina 7–20(–30) cm long; fig receptacle 0.6–2.5 cm diam. when dry 11
11a. Basal pair of lateral veins up to 1/8–1/3 the length of the lamina; fig receptacle 0.6–1 cm diam. when dry . . . . . **1. F. allutacea**
b. Basal lateral veins up to 1/3–1/2(–2/3) the length of the lamina; fig receptacle 1.5–2.5 cm diam. when dry . . . . . **2. F. apiocarpa**
12a. Indumentum partly consisting of uncinate hairs . . . . . **48. F. recurva**
b. Indumentum without uncinate hairs 13
13a. Basal bracts persistent 14
b. Basal bracts caducous 18
14a. Lamina ± scabrous above . . . . . **63. F. trichocarpa**
b. Lamina smooth above 15
15a. Lateral veins usually 6–10 pairs 16
b. Lateral veins usually 3–6 pairs 17
16a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent . . . . . **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed . . . . . **51. F. sagittata**
17a. Petiole 0.3–1.5 cm long; fig receptacle 0.4–1 cm diam. when dry . . . . . **48e. F. recurva** var. **urnigera**
b. Petiole 1.5–7.5 cm long; fig receptacle 1–2.5 cm diam. when dry . . . . . **2. F. apiocarpa**
18a. Lateral veins 6–10 pairs 19
b. Lateral veins 3–6 pairs 20
19a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent . . . . . **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed . . . . . **51. F. sagittata**
20a. Leafy twigs sparsely (and minutely) hairy . . . . . **48e. F. recurva** var. **urnigera**
b. Leafy twigs densely hairy 21
21a. Stipules 0.5–0.8 cm long; petiole densely pale brown to greyish floccose-villous . . . . . **31. F. araneosa**
b. Stipules usually 1–2 cm long; petiole brown hirtellous to velutinous 22
22a. Petiole 1–3 cm long; fig receptacle 0.3–0.7 cm long stipitate; ostiole flat to slightly prominent . . . . . **42. F. lanata**
b. Petiole 0.3–1.2 cm long; fig receptacle 0–0.1 cm long stipitate; ostiole ± sunken . . . . . **47. F. pendens**

REGIONAL KEY: JAVA

1a. Leafy twigs with pairs of subnodal waxy glands below (the scars of) the petioles . . . . . **29. F. laevis**
b. Leafy twigs without waxy glands 2
2a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated . . . . . **28. F. pumila**
b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 3
3a. Lower surface of the lamina foveolate (the areoles surrounded by a rim) or tessellate (the areoles brownish when dry, usually surrounded by paler coloured tissue) 4
b. Lower surface of the lamina neither foveolate nor clearly tessellate 8
4a. Lamina ± scabrous above . . . . . **24. F. trachycoma**
b. Lamina smooth above 5
5a. Figs usually cauliflorous, the receptacle 1–10 cm diam. when dry . . . . . **17. F. punctata**
b. Figs axillary in pairs or clustered (also on the older wood), the receptacle 0.2–1 cm diam. when dry 6
6a. Leafy twigs densely and conspicuously hairy . . . . . **42. F. lanata**
b. Leafy twigs sparsely and/or minutely hairs to glabrous 7
7a. Petiole 0.3–1(–2) cm long; lamina 1–5(–7.5) cm long; fig receptacle 0.3–0.6 (–0.8) cm diam. when dry . . . . . **10. F. disticha**
b. Petiole 1–4 cm long; lamina 7–21 cm long; fig receptacle 0.6–1 cm diam. when dry . . . . . **1. F. allutacea**
8a. Indumentum partly consisting of uncinate hairs . . . . . **48. F. recurva**
b. Indumentum without uncinate hairs 9
9a. Basal bracts persistent 10
b. Basal bracts caducous 13
10a. Lamina ± scabrous above . . . . . **63. F. trichocarpa**
b. Lamina smooth above 11
11a. Lateral veins 3–6 pairs . . . . . **48e. F. recurva** var. **urnigera**
b. Lateral veins 6–10 pairs 12
12a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent . . . . . **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed . . . . . **51. F. sagittata**
13a. Lateral veins 6–10 pairs 14
b. Lateral veins 3–6 pairs 15
14a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent . . . . . **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed . . . . . **51. F. sagittata**

15a. Leafy twigs sparsely (and minutely) hairy ..... **48e. F. recurva** var. **urnigera**
b. Leafy twigs densely hairy 16
16a. Petiole 1–3 cm long; fig receptacle 0.3–0.7 cm long stipitate; ostiole flat to slightly prominent ..... **42. F. lanata**
b. Petiole 0.3–1.2 cm long; fig receptacle 0–0.1 cm long stipitate; ostiole ± sunken ..... **47. F. pendens**

REGIONAL KEY: LESSER SUNDA ISLANDS

1a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated ..... **28. F. pumila**
b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 2
2a. Lamina ± scabrous above ..... **63. F. trichocarpa**
b. Lamina smooth above 3
3a. Figs usually cauliflorous, usually 3–5 cm diam. when dry ... **17. F. punctata**
b. Figs in the leaf axils or on short spurs on the older wood usually 0.5–1 cm diam. when dry ..... **51. F. sagittata**

REGIONAL KEY: BORNEO

1a. Leafy twigs with pairs of subnodal waxy glands below (the scars of) the petioles ..... **29. F. laevis**
b. Leafy twigs without waxy glands 2
2a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated ..... **28. F. pumila**
b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 3
3a. Lower surface of the lamina foveolate (the areoles surrounded by a rim) or tessellate (the areoles brownish when dry, usually surrounded by paler coloured tissue) 4
b. Lower surface of the lamina neither foveolate nor clearly tessellate 23
4a. Lower surface of the lamina foveolate 5
b. Lower surface of the lamina tessellate 17
5a. Petiole 0.2–1 cm long; stipules 0.3–1 cm long; lamina often shorter than 10 cm 6
b. Petiole 1–4 or 4–13 cm long; stipules (0.5–)1–2(–4.5) cm long and/or the lamina (mostly) longer than 10 cm 11
6a. Lamina asymmetric with 1 waxy gland in the axil of the basal lateral vein at the broad side of the lamina 7
b. Lamina symmetric (or slightly asymmetric at the base) with waxy glands in the axils of both basal lateral veins or absent 8

7a. Main veins of the lamina impressed above; internal hairs absent . . . . . **18. F. ruginervia**
b. Main veins of the lamina almost flat to slightly prominent, or the midrib slightly impressed above; internal hairs abundant . . . . . **17. F. punctata**
8a. Figs axillary in pairs or clustered (also on the older wood), the receptacle 0.2–0.6 cm diam. when dry; areoles without indumentum on the rims . **36. F. excavata**
b. Figs usually cauliflorous, the receptacle 1–10 cm diam. when dry, areoles mostly with minute hairs on the rims 9
9a. Lateral veins 3–6(–7) pairs . . . . . **17. F. punctata**
b. Lateral veins 6–10 pairs 10
10a. Basal lateral veins up to 1/6–1/4 the length of the lamina, (faintly) branched; fig receptacle ellipsoid, the basal bracts 4–6 mm long . . . . . **1. F. barba-jovis**
b. Basal lateral veins up to 1/10–1/6 the length of the lamina, unbranched; fig receptacle depressed-globose, the basal bracts 1.5–2.5 mm long . . **6. F. cavernicola**
11a. Figs axillary or just below the leaves, often clustered, the receptacle 0.4–0.8 cm diam. when dry; rims of the areoles without hairs 12
b. Figs mostly cauliflorous and/or the receptacle more than 1 cm diam. when dry; the rims of the areoles with hairs 13
12a. Basal lateral veins up to c. 1/5–1/3 the length of the lamina; basal bracts (sub)-persistent . . . . . **53. F. supperforata**
b. Basal lateral veins up to c. 1/3–1/2 the length of the lamina; basal bracts caducous . . . . . **42. F. lanata**
13a. Petiole (3–)4–13 cm long and stipules 1.5–5 cm long; figs cauliflorous . . . . . **7. F. densechini**
b. Petiole 1–4 cm long, if up to 5 cm long, then the stipules 1–1.5 cm long, or if up to 10 cm long, then the figs not cauliflorous 14
14a. Lateral veins 3–6 pairs; lamina 2–12 cm long . . . . . **17. F. punctata**
b. Lateral veins 6–10 pairs; lamina mostly longer than 10 cm 15
15a. Venation of the lamina ± impressed above . . . . . **19. F. sarawakensis**
b. Venation flat or the midrib (at least its upper part) slightly prominent above . 16
16a. Fig receptacle 5–6 cm diam. when dry; stipules usually 1–1.7 cm long . . . . . **13. F. grandiflora**
b. Fig receptacle 1.5–2.5 cm diam. when dry; stipules usually 0.4–1 cm long . . . . . **25. F. tulipifera**
17a. Lamina ± asymmetric 18
b. Lamina (almost) symmetric 19
18a. Lamina 4–9 cm long; petiole 0.5–1.5(–2) cm long; fig receptacle c. 1 cm diam. when dry . . . . . **9. F. diandra**
b. Lamina 1–3.5 cm long; petiole 0.3–0.4 cm long; fig receptacle 0.2–0.3 cm diam. when dry . . . . . **10 F. disticha**
19a. Lamina usually 10–20(–30) cm long, the petiole 1–7.5 cm long, the stipules mostly longer 1 cm, and/or the tertiary venation mostly (sub)scalariform . . . 20
b. Lamina usually less than 10 cm long, the petiole and/or the stipules mostly up to 1 cm, and the tertiary venation distinctly reticulate 21

20a. Basal pair of lateral veins up to 1/8–1/3 the length of the lamina; fig receptacle 0.6–1 cm diam. when dry . . . . . **1. F. allutacea**
b. Basal lateral veins up to 1/3–1/2(–2/3) the length of the lamina; fig receptacle 1.5–2.5 cm diam. when dry . . . . . **2. F. apiocarpa**
21a. Peduncle 1–1.3 cm long; apex of lamina subacuminate acute; lamina 7–9 cm long . . . . . **12. F. gamostyla**
b. Peduncle 0–0.4 cm long; apex of lamina rounded to shortly and bluntly acuminate, or if subacute then the lamina usually 1–5 cm long 22
22a. Petiole usually 0.3–1 cm long; fig receptacle usually 0.3–0.6 cm diam. when dry, the basal bracts usually caducous . . . . . **10. F. disticha**
b. Petiole usually 1–2 cm long; fig receptacle 0.6–0.8 cm diam. when dry, the basal bracts persistent . . . . . **8. F. detonsa**
23a. Indumentum partly consisting of uncinate hairs . . . . . **48. F. recurva**
b. Indumentum without uncinate hairs 24
24a. Basal bracts persistent 25
b. Basal bracts caducous 32
25a. Lateral veins 10–16 pairs . . . . . **52. F. spiralis**
b. Lateral veins 3–10 pairs 26
26a. Lamina ± scabrous above . . . . . **63. F. trichocarpa**
b. Lamina smooth above 27
27a. Lamina ± scabrous beneath, by very sparse and/or minute (cystolith) hairs . . . . . **49. F. sabahana**
b. Lamina smooth beneath, or if scabridulous, then distinctly hairy 28
28a. Lamina glabrous . . . . . **8. F. detonsa**
b. Lamina hairy, at least beneath, at least sparsely so on the midrib 29
29a. Lateral veins usually 6–10 pairs 30
b. Lateral veins usually 3–6 pairs 31
30a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent . . . . . **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed . . . . . **51. F. sagittata**
31a. Petiole 0.3–1.5 cm long; fig receptacle 0.4–1 cm diam. when dry . . . . . **48e. F. recurva** var. **urnigera**
b. Petiole 1.5–7.5 cm long; fig receptacle 1–2.5 cm diam. when dry . . . . . **2. F. apiocarpa**
32a. Lamina ± scabrous beneath, with very sparse and or minute (cystolith) hairs . . . . . **49. F. sabahana**
b. Lamina smooth beneath, or if scabridulous, then distinctly hairy 33
33a. Lateral veins 6–10 pairs 34
b. Lateral veins 3–6 pairs 35
34a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent . . . . . **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed . . . . . **51. F. sagittata**

35a. Leafy twigs sparsely (and minutely) hairy ..... **48e. F. recurva** var. **urnigera**
b. Leafy twigs densely hairy 36
36a. Petiole 1–3 cm long; fig receptacle 0.3–0.7 cm long stipitate; ostiole flat to slightly prominent ..... **42. F. lanata**
b. Petiole 0.3–1.2 cm long; fig receptacle 0–0.1 cm long stipitate; ostiole ± sunken ..... **47. F. pendens**

REGIONAL KEY: PHILIPPINES

1a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated ..... **28. F. pumila**
b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 2
2a. Lower surface of the lamina foveolate (the areoles surrounded by a rim) or tessellate (the areoles brownish when dry, usually surrounded by paler coloured tissue) 3
b. Lower surface of the lamina neither foveolate nor clearly tessellate 9
3a. Lamina 1–8(–12) cm long, petiole up to 1 cm long and/or stipules up to 1 cm long 4
b. Lamina usually 10–20 cm long, petiole 1–7.5 cm long, and/or stipules 1–2.5 cm long 7
4a. Fig receptacle 1–5(–10) cm diam. when dry, the basal bracts 2–5 mm long .. 5
b. Fig receptacle 0.3–1 cm diam. when dry, the basal bracts 0.5–1.5 mm long .. 6
5a. Fig receptacle (1.5–)3–5(–10) cm diam. when dry, the basal bracts 3–5 mm long; apex of the lamina minutely retuse ..... **17. F. punctata**
b. Fig receptacle 1–2 cm diam. when dry, the basal bracts 2–3 mm long; apex of the lamina not retuse ..... **5. F. cataupi**
6a. Petiole (0.8–)1–2.5 cm long; basal bracts persistent; fig receptacle 0.4–1.2 cm long stipitate ..... **26. F. warburgii**
b. Petiole usually up to 1 cm long: basal bracts usually caducous; fig receptacle not or up to 0.4 cm long stipitate ..... **10. F. disticha**
7a. Lateral veins 4–6 pairs; fig receptacle 0.6–1 diam. when dry .. **1. F. allutacea**
b. Lateral veins 6–12 pairs; fig receptacle 1.5–3.5 cm diam. when dry 8
8a. Lateral veins 6–8 pairs, the basal pair up to 1/5–1/3 the length of the lamina .. .. **15. F. peninsula**
b. Lateral veins 10–12 pairs, the basal pair up to 1/20–1/10 the length of the lamina ..... **22. F. sohotonensis**
9a. Basal lateral veins 6–10 pairs 10
b. Basal lateral veins 3–6 pairs 11
10a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent ..... **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed ..... **51. F. sagittata**

11a. Indumentum partly consisting of uncinate hairs . . . . . **48. F. recurva**
b. Indumentum without uncinate hairs 12
12a. Lamina ± scabrous above 13
b. Lamina smooth above 14
13a. Basal lateral veins up to 1/2 the length of the lamina; indumentum of the lower surface of the lamina dark brown . . . . . **59. F. perfulva**
b. Basal lateral veins up to 1/2–2/3 the length of the lamina; indumentum of the lower surface of the lamina brown to whitish . . . . . **63. F. trichocarpa**
14a. Leafy twigs and/or petioles sparsely (and minutely) hairy . . . . . **48e. F. recurva** var. **urnigera**
b. Leafy twigs and petioles densely hairy 15
15a. Indumentum of the lower surface of the lamina dark brown, dense and ± patent; fig receptacle 0.7–1 cm diam. when dry . . . . . **59. F. perfulva**
b. Indumentum of the lower surface of the lamina brown, sparse and appressed; fig receptacle 0.4–0.6 cm diam. when dry . . . . . **55. F. bakeri**

REGIONAL KEY: CELEBES

1a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated . . . . . **28. F. pumila**
b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 2
2a. Lower surface of the lamina foveolate (the areoles surrounded by a rim) or tessellate (the areoles brownish when dry, usually surrounded by paler coloured tissue) 3
b. Lower surface of the lamina neither foveolate nor clearly tessellate 6
3a. Lateral veins 8–10 pairs . . . . . **23. F. submontana**
b. Lateral veins usually 3–7 pairs 4
4a. Lamina usually 10–20 cm long and petiole 1–4 cm long . . . . . **1. F. allutacea**
b. Lamina usually up to 10 cm long and petiole up to 1 cm long 5
5a. Figs usually cauliflorous, the receptacle 1.5–5(–10) cm diam. when dry . . . . . **17. F. punctata**
b. Figs in the leaf axils (or on minute spurs on the older wood), 0.3–0.8 cm diam. when dry . . . . . **10. F. disticha**
6a. Tertiary venation scalariform and lateral veins usually 6–10 pairs 7
b. Tertiary venation reticulate (to subscalariform) and/or lateral veins usually 3–6 pairs 8
7a. Lateral veins and smaller veins of the lamina prominent beneath; the hairs on the lamina often ± patent . . . . . **54. F. villosa**
b. Lateral veins of the lamina slightly prominent, the smaller veins (almost) flat; the hairs on the lamina appressed . . . . . **51. F. sagittata**
8a. Figs subsessile, 0.3–0.5 cm dam. when dry . . . . **48e. F. recurva** var. **urnigera**
b. Figs pedunculate, 0.6–1 cm diam. when dry . . . . . **46. F. pantoniana**

REGIONAL KEY: MOLUCCAS

1a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated . . . . . **28. F. pumila**
b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 2
2a. Lower surface of the lamina foveolate (the areoles surrounded by a rim) or tessellate (the areoles brownish when dry, usually surrounded by paler coloured tissue) . . 3
b. Lower surface of the lamina neither foveolate nor clearly tessellate 5
3a. Lamina usually 10–20 cm long and petiole 1–4 cm long . . . . . **1. F. allutacea**
b. Lamina usually up to 10 cm long and petiole up to 1 cm long 4
4a. Figs usually cauliflorous, the receptacle 1.5–5(–10) cm diam. when dry . . . . . **17. F. punctata**
b. Figs in the leaf axils (or on minute spurs on the older wood), 0.3–0.8 cm diam. when dry . . . . . **10. F. disticha**
5a. Lamina ± scabrous above; basal bracts persistent . . . . . **63. F. trichocarpa**
b. Lamina smooth above; basal bracts (usually) caducous 6
6a. Hairs on leafy twigs (partly) with swollen bases 7
b. Hairs on leafy twigs without swollen bases 9
7a. Stiff hairs of leafy twigs breaking off easily, irritant; fig receptacle usually 1.5–3.5 cm diam. when dry . . . . . **43. F. odoardii**
b. Stiff hairs of leafy twigs not breaking off easily; fig receptacle 0.5–1.3 cm diam. when dry 8
8a. Basal bracts 4–6 mm long and ostiole convex . . . . . **35. F. devestiens**
b. Basal bracts 1.5–2 mm long and ostiole sunken . . . . . **54. F. villosa**
9a. Tertiary venation reticulate (to subscalariform); basal lateral veins unbranched . . . . . **46. F. pantoniana**
b. Tertiary venation scalariform . . . . . **51. F. sagittata**

REGIONAL KEY: NEW GUINEA

1a. Lower surface of the lamina foveolate with deep stomatal pits and the areoles surrounded by very prominent veinlets; the midrib of the lamina not reaching the apex; cultivated . . . . . **28. F. pumila**
b. Lower surface of the lamina not foveolate or, if foveolate, then the stomatal pits shallow, surrounded by slightly prominent to almost flat veinlets, often bearing short hairs ± covering the stomatal pits; indigenous 2
2a. Lower surface of the lamina foveolate (the areoles surrounded by a rim) or tessellate (the areoles brownish when dry, usually surrounded by paler coloured tissue) . . 3
b. Lower surface of the lamina neither foveolate nor clearly tessellate 7
3a. Basal lateral veins up to 1/10–1/8 the length of the lamina; petiole usually 1–4; stipules usually 1–2 cm long 4

b. Basal lateral veins up to 1/8–1/3 the length of the lamina; petiole usually up to 1 cm long and/or stipules up to 1 cm long 5
4a. Lamina glabrous; fig receptacle subglobose and 0.7–1.5 cm diam. or 8–10 by 3–4.5 when dry . . . . . **20. F. scratchleyana**
b. Lamina hairy on the veins beneath; fig receptacle subglobose to subpyriform and 2–3.5 cm diam. when dry . . . . . **14. F. gymnorygma**
5a. Acumen of the lamina shortly mucronate . . . . . **16. F. phatnophylla**
b. Acumen (or apex) of the lamina minutely retuse 6
6a. Basal lateral veins up to 1/4–1/3 the length of the lamina; figs axillary, the basal bracts 1.5–3 mm long . . . . . **11. F. distichoidea**
b. Basal lateral veins usually up to 1/4 the length of the lamina; figs also below the leaves on minute spurs, the basal bracts 0.5–15 mm long . . . . . **10. F. disticha**
7a. Lamina glabrous 8
b. Lamina hairy, at least beneath, at least sparsely so on the midrib 10
8a. Basal lateral branched; fig receptacle 1.2–2.5 cm diam. when dry . . . . . **58. F. jimiensis**
b. Basal lateral unbranched; fig receptacle 0.3–1 cm diam. when dry 9
9a. Acumen of the lamina shortly mucronate; fig receptacle 0.3–0.4 cm diam. when dry . . . . . **16. F. phatnophylla**
b. Acumen or apex of the lamina not mucronate; fig receptacle 0.6–1 cm diam. when dry . . . . . **46. F. pantoniana**
10a. Basal bracts persistent 11
b. Basal bracts caducous 17
11a. Tertiary venation scalariform; lamina usually or often longer than 10 cm, occasionally less than 5 cm long 12
b. Tertiary venation reticulate or to subscalariform (with few, ± irregular, transverse (and parallel) tertiary veins, in particular in relatively large leaves); lamina always or often less than 10 cm long, often less than 5 cm long and with 3–6 pairs of lateral veins, or, if usually longer than 10 cm 14
12a. Basal bracts 1–2 mm long . . . . . **60. F. phaeobullata**
b. Basal bracts 3–7(–10) cm long 13
13a. Basal lateral veins up to c. 1/2(–2/3) the length of the lamina; lamina sparsely hairy beneath . . . . . **62. F. supfiana**
b. Basal lateral veins 2/3–3/4 the length of the lamina; lamina densely hairy beneath . . . . . **57. F. hypophaea**
14a. Figs (sub)sessile 15
b. Figs pedunculate 16
15a. Epidermis of the petiole flaking off; lower surface of the lamina hairy on the main veins; fig receptacle globose to ovoid . . . . . **44. F. ovatacuta**
b. Epidermis of the petiole persistent; lower surface of the lamina hairy also on the smaller veins; fig receptacle ellipsoid . . . . . **34. F. colobocarpa**
16a. Lamina sparsely puberulous to subtomentose beneath; basal bracts 1–2 mm long . . . . . **61. F. pleiadenia**
b. Lamina densely floccose-tomentose beneath; basal bracts c. 3 mm long . . . . . **56. F. cinnamomea**

17a. Tertiary venation scalariform; lamina usually or often longer than 10 cm, occasionally less than 5 cm long 18
b. Tertiary venation reticulate or to subscalariform (with few, ± irregular, transverse (parallel) tertiary veins, in particular, in relatively large leaves; lamina always or often less than 10 cm long, often less than 5 cm long 29
18a. Figs on spurs below the leaves (but already developing in the leaf axils), if the figs small, then often clustered, or if large, then often in pairs or solitary . . . 19
b. Figs in pairs or solitary in the leaf axils or just below the leaves 20
19a. Fig receptacle hairy; indumentum partly consisting of irritant hairs present . . . . . **43. F. odoardii**
b. Fig receptacle glabrous; indumentum without irritant hairs **33. F. camptandra**
20a. Fig receptacle (usually) 1.2–3.5(–5) cm diam. when dry 21
b. Fig receptacle 0.3–1.2 cm diam. when dry 24
21a. Leafy twigs and lower surface of the lamina very sparsely and inconspicuously hairy . . . . . **41. F. jacobsii**
b. Leafy twigs and/or the lamina beneath ± densely and conspicuously hairy . . 22
22a. Indumentum (in particular that of the fig receptacle) partly consisting of stiff and irritant hairs, which break off easily . . . . . **43. F. odoardii**
b. Indumentum without irritant hairs 23
23a. Petiole (1–)2–3.5 cm long; stipules 0.5–0.8 cm long; fig receptacle non-stipitate; ostiole surrounded by a tuft of hairs . . . . . **38. F. fuscata**
b. Petiole (0.5–)1–2 cm long; stipules (0.5–)1–2 cm long; fig receptacle stipitate; ostiole not surrounded by a tuft of hairs . . . . . **32. F. baeuerlenii**
24a. Stipules 0.5–1 cm long 25
b. Stipules (0.5–)1–2.5 cm long 26
25a. Figs sessile, the receptacle non-stipitate; basal bracts 1.5–2 mm long . . . . . **50. F. sageretina**
b. Figs (shortly) pedunculate, the receptacle stipitate; basal bracts 3–4 mm long . . . . . **32. F. baeuerlenii**
26a. Indumentum of the fig receptacle short-velutinous (dense), the apex of the receptacle ± protracted . . . . . **32. F. baeuerlenii**
b. Indumentum of the fig receptacle hirtellous, strigillose, or absent, the apex of the receptacle convex, flat, or slightly umbonate 27
27a. Lamina ± bullate above; indumentum partly consisting of irritant hairs, which break off easily; basal bracts 3–7 mm long and free . . . . . **40. F. insculpta**
b. Lamina flat above; indumentum without irritant hairs; basal bracts 2–2.5 mm long and free or 4–6 mm long and connate 28
28a. Basal lateral veins up to c. 1/3–1/2 the length of the lamina; basal bracts 2–2.5 mm long and free; receptacle sparsely puberulous and brown pulverulent . . . . . **45. F. oxymitroides**
b. Basal lateral veins up to c. 1/5–1/3 the length of the lamina; basal bracts 4–6 mm long and connate; receptacle brown hirtellous . . . . . **35. F. devestiens**
29a. Lamina ± scabrous above . . . . . **30. F. ampulliformis**
b. Lamina smooth above 30

30a. Lamina glabrous beneath . . . . . **46. F. pantoniana**
b. Lamina hairy on the veins beneath 31
31a. Lamina brown floccose-tomentose beneath; lateral veins (5–)6–9 pairs, the basal pair up to 1/5–1/3 the length of the lamina . . . . . **37. F. floccifera**
b. Lamina brown (sub)strigillose beneath; lateral veins 4 or 5, the basal pair up to 1/3–1/2 the length of the lamina . . . . . **39. F. hypobrunnea**

Section Kissosycea

Ficus L. subg. *Synoecia* (Miq.) Miq. sect. *Kissosycea* Miq., London J. Bot. 7 (1848) 452; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294.
Synoecia Miq. sect. *Verae* Miq., Fl. Ind. Bat. 1, 2 (1859) 329.
Synoecia Miq. sect. *Kalosyce* Miq., Fl. Ind. Bat. 1, 2 (1859) 329. — *Ficus* L. subg. *Ficus* sect. *Kalosyce* Miq.: Corner, Gard. Bull. Singapore 18 (1960) 21; 21 (1965) 4, 60.
Urostigma Gasp. sect. *Apiosycea* Miq., Fl. Ind. Bat., Suppl. (1861) 440.
Ficus L. sect. *Synoecia* (Miq.) Benth. & Hook.f., Gen. Pl. 3 (1880) 369; King, Sp. Ficus 1 (1887) 1, 121; Corner, Gard. Bull. Singapore 10 (1939) 82; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 245.
Ficus L. sect. *Eusyce* (Miq.) Benth. & Hook.f. subsect. *Areolatifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 327, 384.
Ficus L. sect. *Rhizocladus* Endl. ser. *Distichae* Corner, Gard. Bull. Singapore 18 (1960) 5.
Ficus L. sect. *Rhizocladus* Endl. ser. *Distichoideae* Corner, Gard. Bull. Singapore 18 (1960) 5.
Ficus L. sect. *Kalosyce* (Miq.) Corner ser. *Apiocarpeae* Corner, Gard. Bull. Singapore 18 (1960) 22.
Ficus L. sect. *Kalosyce* (Miq.) Corner ser. *Punctatae* Corner, Gard. Bull. Singapore 18 (1960) 22. — *Ficus* L. sect. *Kalosyce* (Miq.) Corner ser. *Punctatae* Corner subser. *Punctatae* Corner, Gard. Bull. Singapore 18 (1960) 22.
Ficus L. sect. *Kalosyce* (Miq.) Corner ser. *Punctatae* Corner subser. *Ruginerviae* Corner, Gard. Bull. Singapore 18 (1960) 22.

Lamina (of acrophylls) often ± asymmetric, the lower surface foveolate or (brown) tessellate (when dry). *Figs* often cauliflorous; basal bracts persistent; ostiole ± prominent to slightly sunken. *Staminate* and *neuter flowers* mostly scattered among the pistillate flowers, sometimes near the ostiole. Stamens 1 (or 2), the anthers short elliptic to oblong in outline, not mucronate. *Tepals* of the pistillate flowers lanceolate to linear to almost subulate, mostly red. *Ovaries* of short-styled flowers (dark) red-brown.

Distribution — This section comprises 28 species and ranges from Sri Lanka to Australia and the Solomon Islands; only two species (*F. diversiformis* and *F. hederacea* Roxb.) are confined to the Asian mainland, the others occur in the Malesian region.

Subdivision — The section is rather homogeneous, but allows recognition of two groups with distinct links, in particular in the features of the areoles.

a. *Ficus apiocarpa*-group (ser. *Apiocarpae* Corner) — *Lamina* symmetric or asymmetric, at least at the base, tessellate beneath, the areoles brownish surrounded with pale-coloured tissue (when dry). *Figs* (usually) axillary, small to large. *Staminate* and *neuter flowers* scattered among the pistillate ones or near the ostiole. *Stamens* 1 (or 2). *Fruits* not or short stipitate.
Distribution — The group is centred in western Malesia, two species are confined to New Guinea, one species extends to the Asian mainland, to which two species are confined (*F. diversiformis* and *F. hederacea*). It comprises the follow-

ing species in Malesia: *F. allutacea*, *F. apiocarpa*, *F. barba-jovis*, *F. detonsa*, *F. diandra*, *F. disticha*, *F. distichoidea*, *F. gamostyla*, *F. peninsula*, *F. phatnophylla*, *F. sohotonensis*, *F. submontana*, and *F. warburgii*. *Ficus detonsa*, *F. distichoidea*, and *F. warburgii* constitute a set of probably related species, being in dimensions of the leaves intermediate between *F. disticha* and a group of large(r)-leafed species, comprising *F. apiocarpa* and allied species, in which the position of the leaves varies from lax spirals to distichous.

b. *Ficus punctata*-group (ser. *Punctatae* Corner) — *Lamina* often asymmetric, at least at the base, foveolate beneath, the stomatal pits brownish (when dry) with short hairs on the rims. *Figs* axillary or cauliflorous, often large, and then with a wide cavity and the staminate and neuter flowers numerous and with long pedicels; internal hairs absent or sparse. *Staminate* and *neuter flowers* scattered among the pistillate ones, the tepals often connate. *Stamens* 1 (or 2). *Fruits* often long-stipitate.

Distribution — This group is centred in western Malesia, only two species are confined to New Guinea (and New Britain), and one, *F. punctata,* extends to the Asian mainland and Taiwan. The group comprises the following species: *F. carrii*, *F. cataupi*, *F. cavernicola*, *F. densechini*, *F. grandiflora*, *F. gymnorygma*, *F. punctata*, *F. ruginervia*, *F. sarawakensis*, *F. scratchleyana*, *F. singalana*, *F. trachycoma*, and *F. tulipifera*.

Morphology — The group shows a considerable variation in the dimensions of fig receptacles, even within species, as in *F. punctata* and *F. scratchleyana*. In the large figs of this group the large number of the staminate and neuter flowers and the conspicuous length of their pedicels are remarkable. Moreover, staminate flowers are sometimes absent in figs with short-styled flowers and figs may contain staminate flowers only. The scarcity of material does not allow tracing patterns in the variation of the size of the figs and the distribution of the four types of flowers.

1. **Ficus allutacea** Blume

Ficus allutacea Blume, Bijdr. (1825) 457; Miq., Fl. Ind. Bat. 1, 2 (1859) 319; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; King, Sp. Ficus 2 (1888) 131, t. 164; Fl. Brit. India 5 (1888) 527; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 227; Koord., Exk. Fl. Java 4 (1924) t. 772; Ridl., Fl. Malay Penins. 3 (1924) 344; Backer & Bakh.f., Fl. Java 2 (1965) 22, '*alutacia*'; Corner, Gard. Bull. Singapore 21 (1965) 58; Kochummen, Tree Fl. Malaya 3 (1978) 139; Tree Fl. Sabah & Sarawak 3 (2000) 240.

Ficus teysmanniana Miq., Fl. Ind. Bat. 1, 2 (1859) 319; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294. — *Ficus allutacea* Blume var. *teysmanniana* (Miq.) King, Sp. Ficus 2 (1888) 131.

Ficus areolata Elmer, Leafl. Philipp. Bot. 4 (1911) 1252; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 45; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 339.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–4 mm thick, solid, sparsely and minutely whitish puberulous to glabrous. *Leaves* in lax spirals to distichous; lamina oblong to elliptic, 7–21 by 3–11 cm, symmetric, (sub)coriaceous, apex shortly acuminate (to acute), base equilateral, obtuse to rounded, margin entire, ± revolute; both surfaces glabrous, the lower surface tessellate when dry; cystoliths only beneath; midrib ± impressed (the lower part) to flat (the upper part) above, lateral veins

4–6 pairs, the basal pair up to c. 1/8–1/3 the length of the lamina, often weakly developed, unbranched or faintly branched, tertiary venation reticulate to (sub)scalariform, the smaller veins (almost) flat beneath, the areoles brownish when dry; waxy glands in the axils of the basal lateral veins, inconspicuous, or absent; petiole 1–4 cm long, glabrous, the epidermis flaking off; stipules 0.5–1.5 cm long, (very) sparsely white appressed-puberulous, subpersistent or caducous. *Figs* axillary, solitary or in pairs, or on minute spurs on the older wood; peduncle 0.4–1.8 cm long; basal bracts 1–1.5 mm long, caducous or subpersistent; receptacle subglobose to ellipsoid, 0.6–1 cm diam. when dry, non-stipitate or substipitate, glabrous, yellow to orange to scarlet to crimson at maturity, apex convex, ostiole c. 1 mm diam., slightly prominent to slightly sunken; internal hairs few and short or absent. *Tepals* red. *Stamens* 2.

Distribution — Malay Peninsula (Perak), Sumatra, Java, Borneo (incl. Natuna Islands), Philippines (Mindanao), Celebes (Minahassa), Moluccas (Buru).

Habitat — Forest, at altitudes up to c. 1000 m.

Note — This species shows affinities to *F. apiocarpa* and closely allied species. It differs from these species in the smaller fig receptacles.

2. Ficus apiocarpa (Miq.) Miq.

Ficus apiocarpa (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 269, 289; King, Sp. Ficus 2 (1888) 70, t. 92; Fl. Brit. India 5 (1888) 518; Becc., For. Borneo (1902) 603; Merr., Enum. Born. (1921) 220; Ridl., Fl. Malay Penins. 3 (1924) 338; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1004; Corner, Gard. Bull. Singapore 10 (1939) 99, t. 1–4, 8, 37; 21 (1965) 60; Kochummen, Tree Fl. Malaya 3 (1978) 140; Tree Fl. Sabah & Sarawak 3 (2000) 238. — *Urostigma apiocarpum* Miq., Fl. Ind. Bat., Suppl. (1861) 440. — *Synoecia apiocarpa* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 313, nom. in synon.

Ficus tetangis Miq., Fl. Ind. Bat., Suppl. (1861) 432.

Ficus apiocarpa (Miq.) Miq. var. *villosa* Corner, Gard. Bull. Singapore 18 (1960) 23.

Root-climber. *Branchlets* drying brown; scars of the leaves 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) symmetric, 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 beneath; midrib slightly prominent above, lateral veins (3–)4–6 pairs, the basal pair up to 1/3–1/2(–3/4) the length of the lamina, branched, the other lateral veins often branched or furcate far from the margin, tertiary venation subscalariform to reticulate, the smaller veins slightly prominent to flat 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 ciliolate, 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), 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 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.

Distribution — Thailand and Malesia; in *Malesia*: Sumatra (incl. Banka and Lingga), Malay Peninsula, Borneo.

Habitat — Forest, often swamp forest, at low altitudes.

Notes — 1. An uncommon form with the leafy twigs, the petioles and the lower surface of the lamina hairy (recognized as var. *villosa*) is found in the Malay Peninsula and N Borneo.

2. This species shows affinities to *F. allutaceae*, *F. peninsula*, and *F. submontana*, and more remotely to *F. detonsa*.

3. Ficus barba-jovis Corner

Ficus barba-jovis Corner, Gard. Bull. Singapore 10 (1939) 102, t. 5, 6, 35; 21 (1965) 62; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 251.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–3 mm thick, solid, minutely puberulous and partly pilose. *Leaves* distichous; lamina oblong to elliptic, (2–)5–12 by (1–)2–5.5 cm, ± asymmetric (at least at the base), coriaceous, apex (sub)acuminate, base ± inequilateral, the broad side slightly decurrent and (sub)auriculate, the narrow side obtuse to subcordate, margin entire, ± revolute; upper surface glabrous, lower surface sparsely pilose on the main veins, sparsely minutely puberulous or glabrous on the rims of the areoles, areoles foveolate or tessellate when dry, or neither foveolate nor tessellate; cystoliths only beneath; midrib slightly prominent above, lateral veins 6–9 pairs, the basal pair up to c. 1/6–1/4 the length of the lamina, (faintly) branched, other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller veins slightly prominent to flat beneath, the areoles foveolate, only brownish when dry, or neither foveolate nor tessellate; waxy glands in the axils of the basal lateral veins; petiole 0.4–0.8 cm long, pilose, the epidermis flaking off; stipules 0.4–0.8 cm long, minutely appressed-puberulous or also subpilose, subpersistent. *Figs* cauliflorous, solitary; peduncle 0.2–0.5 cm long; basal bracts 4–6 mm long, persistent; receptacle ellipsoid, 2.5–3 cm diam. when dry, c. 5 cm diam. when fresh, non-stipitate or up to 0.8 cm long stipitate, whitish to brownish velutinous, pinkish at maturity, apex convex to slightly umbonate, ostiole c. 3 mm diam., surrounded by a rim; internal hairs rather sparse or absent. *Tepals* red. *Stamen* 1.

Distribution — Borneo (Sabah: Mt Kinabalu).

Habitat — Forest, at altitudes between 500 and 1700 m.

Notes — 1. This species is remarkable in the variation of the lower surface of the lamina on which the areoles are (partly) not distinct, (partly) brownish tessellate, or partly foveolate, representing the successive stages of the differentiation of the lower surface of the lamina. The leaves are born on slender rooting branches. Whether the material under this name represent a subbathyphyll-state is not clear.

2. The species shows affinities to *F. cataupi*.

4. **Ficus carrii** Corner

Ficus carrii Corner, Gard. Bull. Singapore 10 (1939) 123, t. 14–16, 36; 21 (1965) 62; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 252.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–4 mm thick, solid or hollow, brown puberulous and partly hirtellous. *Leaves* in lax spirals to distichous; lamina oblong to elliptic to subovate, 9–21 by 4.5–9 cm, ± asymmetric, at least at the base, coriaceous, apex acuminate, base inequilateral, the broad side ± decurrent and

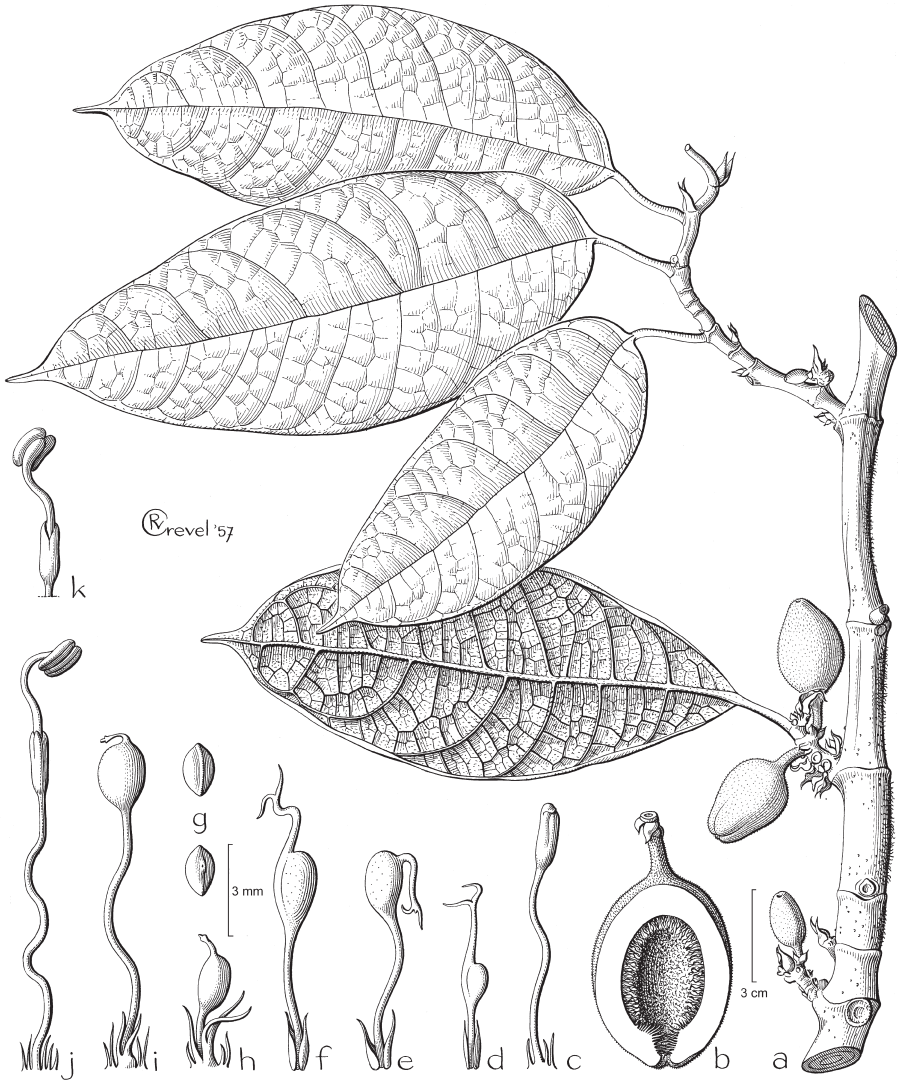

Fig. 92. *Ficus carrii* Corner. a. Branch with leafy twig and fig-bearing branchlets; b. fig; c. neuter flower; d–f. long-styled flowers; g. fruits; h, i. short-styled flowers; j, k. staminate flowers (a–g: *SF 26699*; h–k: *SF 27839*).

(sub)auriculate, the narrow side rounded to obtuse, margin entire, revolute; upper surface glabrous, lower surface hirtellous on the main veins, sparsely minutely puberulous on the rims of the areoles; cystoliths only beneath; midrib impressed above, also the lateral veins often ± impressed, lateral veins (6–)7–9 pairs, the basal lateral veins of the broad side of the lamina up to c. 1/10–1/8 the length of the lamina, often rather poorly developed, branched or unbranched, other lateral veins often furcate far from the margin, tertiary venation reticulate (to subscalariform), the smaller veins slightly prominent to (almost) flat beneath, the areoles foveolate; waxy gland in the axil of the basal lateral vein at the side with the subauriculate base; petiole 1–5 cm long, puberulous, the epidermis flaking off; stipules 1–1.5 cm long, ± densely and minutely appressed-puberulous, subpersistent or caducous. *Figs* cauliflorous on leafless branchlets with short internodes or axillary, solitary; peduncle 0.2–0.6 cm long; basal bracts 3–4 mm long, persistent; receptacle ellipsoid, c. 3.5–5.5 cm diam. when dry, 5–7 cm diam. when fresh, 1–1.5 cm long stipitate, brown velutinous, brownish purple at maturity, apex ± umbonate, ostiole c. 2 mm diam., slightly sunken; internal hairs sparse. *Tepals* red. *Stamen* 1. *Fruits* hardly compressed and not keeled. — **Fig. 92.**

Distribution — Borneo (Sabah: Mt Kinabalu).

Habitat — Forest, at altitudes between 1200 and 1700 m.

Note — This species can be distinguished from two other cauliflorous Bornean species with leaves usually longer than 10 cm, *F. densechini* and *F. grandiflora*, by the presence of hairs on the main veins of the lamina beneath. It differs from *F. sarawakensis*, which has laminas of similar size and indumentum on the main veins of the lamina beneath, in the broader lamina and the densely hairy fig receptacle.

5. Ficus cataupi Elmer

Ficus cataupi Elmer, Leafl. Philipp. Bot. 4 (1911) 1251; 7 (1914) 2387; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 48; Corner, Gard. Bull. Singapore 10 (1939) 127, t. 17, 35; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 338; Corner, Gard. Bull. Singapore 21 (1965) 62; Blumea 20 (1972) 429.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 1.5–2.5 mm thick, solid, whitish to brownish puberulous. *Leaves* distichous; lamina oblong to elliptic to subovate, (2–)3.5–8 by (1–)1.5–3.5 cm, ± asymmetric (at least at the base) to almost symmetric, coriaceous, apex subacute to obtuse, base ± inequilateral to almost equilateral, if inequilateral, then one (the broad) side often slightly decurrent and (sub)auriculate, the narrow side rounded to obtuse, if equilateral, then obtuse to cordulate, margin entire, revolute; upper surface puberulous on the midrib or glabrous, lower surface sparsely puberulous on the main veins, sparsely minutely puberulous on the rims of the areoles; cystoliths only beneath; midrib slightly prominent to flat above, lateral veins (3–)5–7 pairs, the basal lateral veins of the broad side of the lamina up to c. 1/6–1/4 the length of the lamina, branched or unbranched, tertiary venation reticulate, the smaller veins (almost) flat beneath, the areoles foveolate; waxy glands in the axils of the basal lateral veins; petiole 0.3–0.9 cm long, puberulous, the epidermis flaking off; stipules 0.4–0.8 cm long, glabrous, caducous. *Figs* axillary, solitary; peduncle 0.1–0.3 cm long; basal bracts 2–3 mm long, persistent; receptacle ellipsoid, c. 1–2 cm diam. when dry, 2–3 cm diam. when fresh, up to 3 cm long stipitate or substipitate, whitish puberulous, purple

at maturity, apex ± umbonate, ostiole c. 1.5 mm diam., slightly sunken; internal hairs sparse and small. *Tepals* red. *Stamen* 1.

Distribution — Philippines (Mindanao).

Habitat — Montane forest.

Notes — 1. This species show affinities to *F. cavernicola*, as in the size of the lamina (mostly shorter than 10 cm) and the short petiole (up to 1 cm long), features by which these two species differ from the set of larger-leaved species with consistently foveolate laminas from northern Borneo.

2. It also shows affinities to *F. barba-jovis*.

6. Ficus cavernicola C.C. Berg

Ficus cavernicola C.C. Berg, Blumea 48 (2003) 555.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–4 mm thick, solid, (rather) densely brown hirtellous to pilose. *Leaves* distichous; lamina elliptic, 5–6 by 3–3.5 cm, almost symmetric, coriaceous, apex subacute to obtuse, base ± inequilateral to almost equilateral, if inequilateral, then one (the broad) side often slightly decurrent and (sub)auriculate, the narrow side rounded to obtuse, if equilateral, then rounded to cordulate, margin entire, revolute; upper surface glabrous, lower surface sparsely pilose to puberulous on the main veins, (glabrescent), minutely puberulous on the rims of the areoles; cystoliths only beneath; midrib slightly prominent to flat (but in a depression) and lateral veins ± impressed above, lateral veins 8–10 pairs, the basal pair at the broad side of the lamina up to c. 1/10–1/6 the length of the lamina, unbranched, tertiary venation reticulate, the smaller veins slightly prominent to flat beneath, the areoles foveolate; waxy glands absent; petiole 0.5–1 cm long, sparsely puberulous, the epidermis flaking off; stipules 0.4–0.6 cm long, ± densely and minutely appressed-puberulous, caducous or subpersistent. *Figs* cauliflorous, solitary; peduncle c. 0.2–0.3 cm long; basal bracts 1.5–2.5 mm long, persistent; receptacle depressed-globose, c. 3.5 cm diam. when dry, substipitate, sparsely brownish appressed-puberulous, colour at maturity unknown, apex convex, ostiole c. 2 mm diam., flat; internal hairs sparse and small. *Tepals* red. *Stamen* 1.

Distribution — Borneo (Sabah: Mt Kinabalu).

Habitat — Montane forest, at c. 2000 m.

Note — This species resembles *F. cataupi* (from the Philippines) in the small laminas and the short petioles, but it differs in the more numerous lateral veins, impressed above, and in the depressed-globose fig receptacle.

7. Ficus densechini Corner

Ficus densechini Corner, Gard. Bull. Singapore 10 (1939) 130, t. 18, 19, 36; 21 (1965) 60; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 240.

Root-climber. *Branchlets* drying brown; scars of the leaves ± prominent. *Leafy twigs* 5–8 mm thick, hollow, sparsely minutely puberulous to glabrous. *Leaves* distichous; lamina elliptic to ovate (or to oblong or subovate), 12–18 by (5–)6–10.5 cm, symmetric, coriaceous, apex acuminate, base equilateral, subcordate to rounded, margin

entire, ± revolute; upper surface glabrous, lower surface glabrous on the veins, minutely white puberulous on the rims of the areoles; cystoliths only beneath; midrib almost flat above, lateral veins (4–)6–8 pairs, the basal pair up to c. 1/8–1/4 the length of the lamina, faintly branched, the other lateral veins often furcate far from the margin, tertiary venation reticulate (to subscalariform), the smaller veins (almost) flat beneath, the areoles foveolate; waxy glands in the axils of the basal lateral veins, inconspicuous; petiole (3–)4–13 cm long, glabrous, the epidermis flaking off; stipules 1.5–5 cm long, minutely puberulous to glabrous, caducous. *Figs* axillary and on up to 1 cm long spurs on the older wood, solitary; peduncle 0.2–0.5 cm long; basal bracts 3–4 mm long, persistent; receptacle subglobose to ellipsoid, c. 4–5(–7.5) cm diam. when dry, 6–7(–12) cm diam. when fresh, 2.5–3.5 cm long stipitate, glabrous, reddish to dark brown at maturity, apex umbonate, ostiole c. 3 mm diam., slightly prominent; internal hairs absent. *Tepals* red. *Stamen* 1.

Distribution — Borneo (Sabah: Mt Kinabalu; Sarawak (Baram District); E Kalimantan: Mt Batu Mayo).

Habitat — Forest, at altitudes up to 1600 m.

Notes — 1. This species can be distinguished from the other cauliflorous Bornean species with leaves usually longer than 10 cm and lacking hairs on the veins of the lamina, and from *F. grandiflora*, by the long petioles, longer than 3 cm.

2. Most collections have been made at Mt Kinabalu. The single collection from E Kalimantan (*McDonald et al. 3628*) differs in the oblong to subovate lamina and the very large fig receptacle, up to 12 cm diam. with a wall up to 2.5 cm thick. The collection from E Kalimantan might represent a distinct not yet described species.

8. **Ficus detonsa** Corner

Ficus detonsa Corner, Gard. Bull. Singapore 18 (1960) 18; 21 (1965) 58; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 236.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, solid, sparsely whitish puberulous to glabrous. *Leaves* distichous or in lax spirals; lamina elliptic to ovate, 4–11 by 2–6 cm, symmetric, coriaceous, apex shortly and bluntly acuminate to obtuse (to rounded), minutely retuse, base equilateral, rounded to obtuse (or to subtruncate), margin entire, revolute; both surfaces glabrous, the lower surface tessellate when dry; cystoliths only beneath; midrib impressed above, lateral veins 4–8 pairs, the basal pair up to 1/8–1/4 the length of the lamina, close to the margin, unbranched, the other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller (almost) flat beneath, the areoles brownish beneath when dry; waxy glands in the axils of the basal lateral veins and minute or absent; petiole (0.8–)1–2(–3) cm long, 1.5–2.5 mm thick, glabrous, the epidermis flaking off; stipules 0.3–1.2 cm long, glabrous, caducous. *Figs* axillary or also just below the leaves, solitary or in pairs, subsessile or with a peduncle up to 0.3 cm long; basal bracts c. 1.5 mm long, persistent; receptacle subglobose, 0.6–0.8 cm diam. when dry, non-stipitate, glabrous, orange to red at maturity, apex convex, ostiole c. 1 mm diam., prominent to flat; internal hairs absent. *Tepals* red. *Stamens* 2.

Distribution — Borneo (Sabah: Mt Kinabalu).

Habitat — Montane forest, at altitudes between 1500 and c. 3000 m.

Note — This species shows clear affinities to *F. warburgii*. It is distinct in the thickly coriaceous lamina with distinctly revolute margins.

9. Ficus diandra Corner

Ficus diandra Corner, Gard. Bull. Singapore 19 (1962) 393; 21 (1965) 60; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 241.

Root-climber. *Branchlets* drying brown to blackish, ± compressed to angular. *Leafy twigs* 1–2 mm thick, solid, glabrous. *Leaves* distichous or in lax spirals; lamina elliptic to oblong, 4–9 by 1.5–4 cm, ± asymmetric, coriaceous, apex acuminate to acute, base inequilateral, narrowly cordate, margin entire, slightly revolute to flat; both surfaces (sub)glabrous, only minute brown trichomes, the lower surface tessellate when dry; cystoliths on both sides; midrib flat above, lateral veins (3–)4–6(–7) pairs, the basal pair up to 1/8–1/4 the length of the lamina, sometimes poorly developed, branched, often a pair of smaller basal lateral veins below the main ones, tertiary venation reticulate, the smaller veins slightly prominent to flat beneath, the areoles brownish beneath when dry; waxy glands in the axils of the basal lateral and also in some other lateral veins; petiole 0.5–1.5(–2) cm long, glabrous, the epidermis flaking off; stipules 0.3–0.7 cm long, glabrous, persistent. *Figs* axillary or on up to 1.5 cm long spurs on the older wood, solitary; subsessile or with a peduncle up to 0.4 cm long; basal bracts 1–1.5 mm long, (sub)persistent; receptacle ellipsoid to subpyriform, c. 1 cm diam. when dry, non-stipitate or substipitate, sparsely pulverulent, orange to red at maturity, apex convex, ostiole 0.5–1 mm diam., slightly prominent to flat, surrounded by a rim; internal hairs absent. *Tepals* reddish. *Stamens* 2.

Distribution — Borneo (Sarawak).

Habitat — Forest, at low altitudes.

10. Ficus disticha Blume

Ficus disticha Blume, Bijdr. (1825) 458; Miq., London J. Bot. 7 (1848) 440; Pl. Jungh. (1851) 56; Fl. Ind. Bat. 1, 2 (1859) 316, t. 22B; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; Náves & Fern.-Vill., Nov. App. (1880) 201; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 253; King, Sp. Ficus 2 (1888) 126, t. 160; Koord., Minah. (1898) 598; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 220; Elmer, Leafl. Philipp. Bot. 2 (1908) 546; 4 (1911) 1262; 7 (1914) 2388; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 51; Koord., Exk. Fl. Java 4 (1924) t. 770; Hochr., Candollea 2 (1925) 332; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 337; Backer & Bakh.f., Fl. Java 2 (1965) 21; Corner, Gard. Bull. Singapore 21 (1965) 58; Kochummen, Tree Fl. Malaya 3 (1978) 145; Tree Fl. Sabah & Sarawak 3 (2000) 244.

Ficus disticha Blume var. *brunneinervia* Hochr., Candollea 2 (1925) 332

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 1–2 mm thick, solid, minutely whitish puberulous to glabrous. *Leaves* distichous; lamina subobovate to obovate to oblong to elliptic to subovate to suborbicular or to lanceolate, 1–5(–7.5) by 0.5–5.5 cm, symmetric (or asymmetric), coriaceous, apex rounded to obtuse to shortly and bluntly acuminate (or to subacute), minutely retuse, initially with some hairs in the notch, base (almost) equilateral, cuneate to obtuse to 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 beneath; midrib ± impressed to flat above, lateral veins (2–)3–7(–8) pairs, the basal pair up to 1/8–1/2 the length of the lamina, well- to ± poorly developed, unbranched, the other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller veins flat 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 asymmetric laminas). *Figs* axillary (or also just below the leaves), in pairs or solitary, 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 up to 0.4 cm long stipitate, (sub)glabrous, yellow to red-brown to 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.

Distribution — From Myanmar to Thailand and Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines, Celebes, Moluccas (Halmahera, Ceram, Ternate), New Guinea (incl. New Britain); extending to the Solomon Islands.

Habitat — Montane forest (often mossy forest) and lowland forest (in Borneo often peat forest), at altitudes up to c. 2200 m.

Notes — 1. In the present concept of the species, *F. agapetoides*, *F. callicarpides*, and *F. calodictya*, recognized by Corner (1965) as distinct, are included in *F. disticha*. The material from Borneo described as *F. callicarpides*, differs from the typical *F. disticha* material in the asymmetric lamina, apparently representing a subacrophyll state of the species with predominantly symmetric lamina, although transitions to the asymmetric lamina can sometimes be found (as in collection *Anderson 8535*). The situation is somewhat less clear with regard to the material referred to the other two species, largely because of the position of the staminate (and neuter) flowers: ostiolar versus disperse. For this reason two subspecies are currently recognized.

2. *Ficus disticha* is closely related to *F. diversiformis* from Sri Lanka, the latter being distinct in the long peduncles and/or stipes of the receptacles and the hairy lower surface of the lamina in some collections.

a. subsp. **disticha**

Ficus callicarpides Corner, Gard. Bull. Singapore 18 (1960) 17; 19 (1962) 391, t. 4; 21 (1965) 57; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 244.

Lamina symmetric (or asymmetric), usually subobovate to obovate, usually up to 5 cm long, apex rounded to obtuse, base cuneate to obtuse, margin mostly clearly revolute; lateral veins (2–)3–6 pairs, the basal pair usually well-developed, up to 1/2 the length of the lamina (subtrinervate). *Figs* axillary (or just below the leaves). *Staminate flowers* scattered among the pistillate ones. — **Fig. 93a, b.**

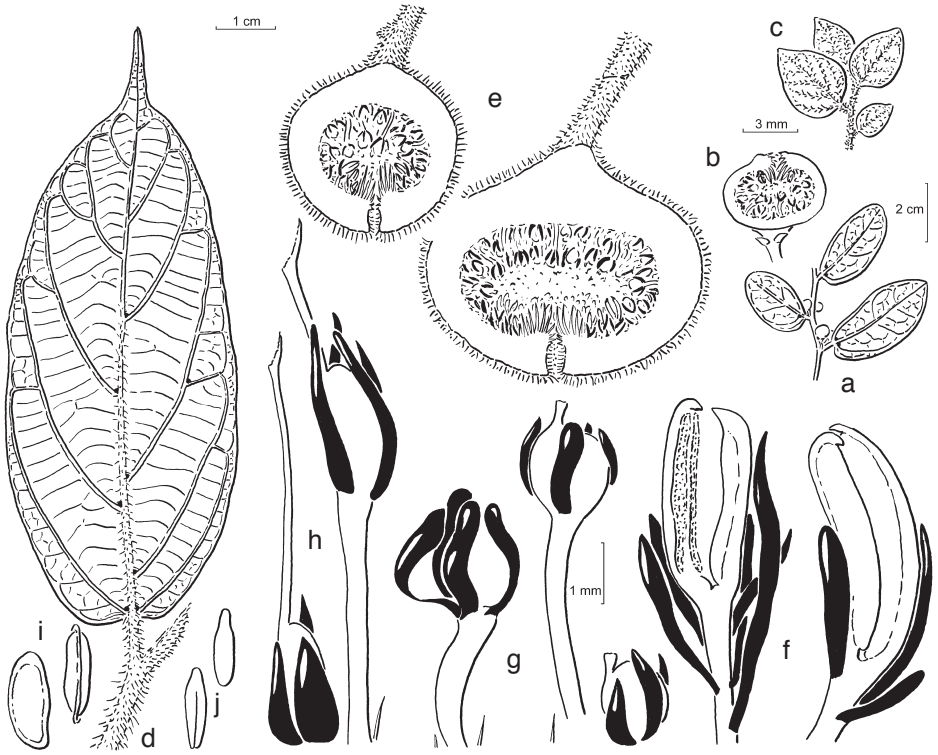

Fig. 93. a, b: *Ficus disticha* Blume subsp. *disticha*. a. Leafy twig; b. fig. — c: *Ficus insculpta* Summerh., leafy twig. — d–j: *Ficus odoardii* King. d. Leafy twig; e. figs (mature and immature); f. staminate flowers; g. short-styled flowers; h. long-styled flowers; i. fruits; j. embryos (all: collections used unknown). From Philos. Trans., Ser. B, 273 (1976) 375.

Distribution — From Myanmar to Thailand and Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines, Celebes.

Habitat — Montane forest (often mossy forest) and lowland forest (in Borneo often peat forest), at altitudes up to c. 2200 m.

b. subsp. **calodictya** (Summerh.) C.C. Berg

Ficus disticha Blume subsp. *calodictya* (Summerh.) C.C. Berg, Blumea 48 (2003) 557. — *Ficus calodictya* Summerh., J. Arnold Arbor. 10 (1929) 149; Diels, Bot. Jahrb. Syst. 67 (1935) 222; Summerh., J. Arnold Arbor. 22 (1941) 103; Corner, Gard. Bull. Singapore 19 (1962) 392, t. 5; 21 (1965) 58.
Ficus agapetoides Diels, Bot. Jahrb. Syst. 67 (1935) 222; Corner, Gard. Bull. Singapore 19 (1962) 392, t. 5.
Ficus calodictya Summerh. var. *gamophylla* Corner, Gard. Bull. Singapore 18 (1960) 18.
Ficus agapetoides Diels var. *solomonensis* Corner, Gard. Bull. Singapore 18 (1960) 18.

Lamina symmetric, varying from subobovate to subovate to elliptic to oblong to (sub)ovate or to suborbicular, up to 7 cm long, apex rounded to obtuse to subacute to

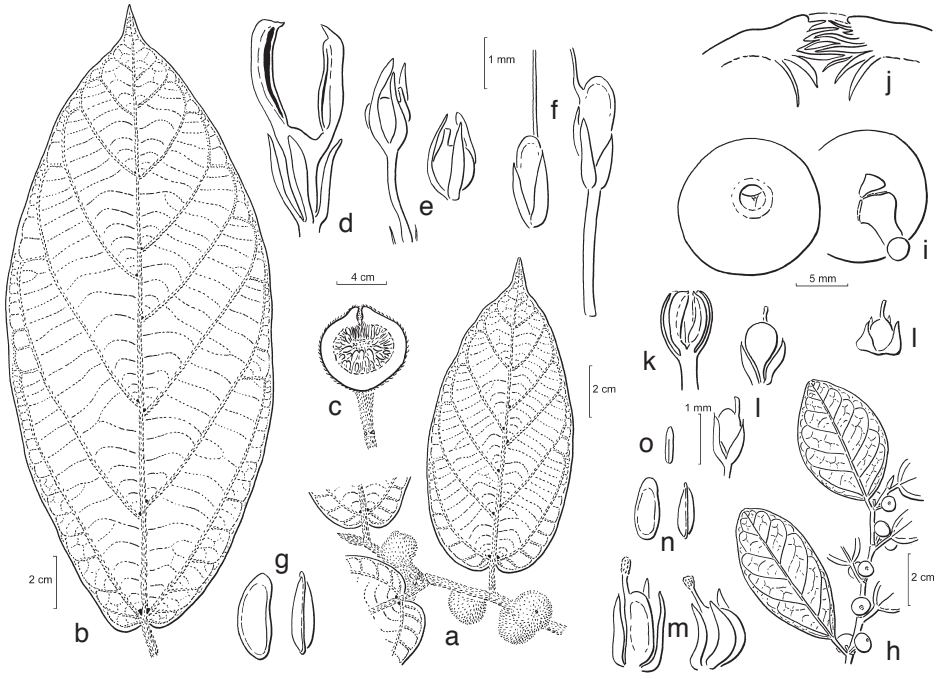

Fig. 94. a–g: *Ficus baeuerlenii* King. a. Leafy twig with figs; b. leaf; c. fig; d. staminate flower; e. short-styled flowers; f. long-styled flowers; g. fruits. — h–o: *Ficus disticha* Blume subsp. *calodictya* (Summerh.) C.C. Berg. h. Leafy twig; i. figs with ostiole and caducous basal bract; j. ostiole; k. staminate flower; l. short-styled flowers; m. long-styled flowers; n. fruits; o. embryos (a–c: *RSS 209*; d–g: collections used unknown; h–j: *RSS 74*). From Philos. Trans., Ser. B, 253 (1967) 87.

shortly and bluntly acuminate, base cuneate to rounded to subcordate, margin often slightly revolute; lateral veins (3–)4–7(–8) pairs, the basal pair often poorly developed, often up to 1/4 the length of the lamina (mostly not subtrinervate). *Figs* also below the leaves, on minute spurs, sometimes clustered. *Staminate flowers* near the ostiole. — **Fig. 94h–o.**

Distribution — Moluccas to the Solomon Islands; in *Malesia:* Moluccas (Halmahera, Ceram, Ternate), New Guinea (incl. New Britain).

Habitat — Forest, at altitudes up to 2000 m.

Note — A number of collections have laminas which cannot be distinguished from those of subsp. *disticha*. They have been made mostly at altitudes between 1000 and 2000 m (mainly in eastern New Guinea). The more common and widespread form of subsp. *calodictya*, with features of the lamina deviating from those of subsp. *disticha*, is associated with lowland forest. That form shows affinities to *F. distichoidea* (from New Guinea and with the staminate flowers ostiolar) as well as to *F. warburgii* (Philippines and with the staminate flowers disperse).

11. **Ficus distichoidea** Diels

Ficus distichoidea Diels, Bot. Jahrb. Syst. 67 (1935) 221; Summerh., J. Arnold Arbor. 22 (1941) 102; Corner, Gard. Bull. Singapore 19 (1962) 392, t. 5; 21 (1965) 58.
Ficus distichoidea Diels var. *platyphylla* Diels, Bot. Jahrb. Syst. 67 (1935) 222.
Ficus pernitida Diels, Bot. Jahrb. Syst. 67 (1935) 195.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 1–2 mm thick, solid, sparsely and minutely whitish puberulous to glabrous. *Leaves* distichous; lamina elliptic to oblong to (sub)ovate, 3.5–9 by 1.5–7 cm, symmetric, coriaceous, apex obtuse to shortly and bluntly acuminate or to rounded, mostly minutely retuse, initially with some hairs in the notch, base equilateral, rounded to subcordate or to cuneate, margin entire, ± revolute; both surfaces glabrous, the lower surface tessellate when dry; cystoliths on both sides; midrib flat above, lateral veins (4–)5–8 pairs, the basal pair up to 1/4–1/3 the length of the lamina, unbranched or faintly branched, the other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller veins flat beneath, the areoles brownish beneath when dry; waxy glands in the axils of the basal lateral veins and often also in the axils of other lateral veins; petiole 0.7–1.7 cm long, minutely puberulous to glabrous, the epidermis flaking off; stipules 0.5–1 cm long, glabrous, caducous. *Figs* axillary, solitary; peduncle 0.2–0.4 cm long; basal bracts 1.5–3 mm long, (sub)persistent or caducous; receptacle subglobose, 0.7–1.2(–1.5) cm diam. when dry, non-stipitate or up to 0.2 cm long stipitate, (sub)glabrous, orange at maturity, apex convex, ostiole 1.5–2 mm diam., prominent to ± sunken; internal hairs absent. *Tepals* red. *Stamens* 2.

Distribution — New Guinea.

Habitat — Forest, at altitudes up to 1000 m.

Notes — 1. This species is closely related to *F. disticha* subsp. *calodictya*, being mainly different in larger leaves and figs. It might prove to be just a large-leaved form of this subspecies.

2. Moreover, this species is closely related to *F. warburgii* from the Philippines. The differences in the venation of these species resemble those between the forms found within *F. disticha* subsp. *calodictya*.

12. **Ficus gamostyla** Kochummen

Ficus gamostyla Kochummen, Gard. Bull. Singapore 50 (1998) 206.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, hollow, glabrous. *Leaves* distichous; lamina subobovate to oblong, 7–9 by 2.5–3.5 cm, symmetric, coriaceous, apex subacuminate to acute, base (almost) equilateral, cuneate to obtuse, margin entire, ± revolute; both surfaces (sub)glabrous, only with minute brown trichomes, the lower surface tessellate when dry; cystoliths only beneath; midrib ± impressed above, lateral veins 6–9 pairs, the basal pair up to 1/4–1/3 the length of the lamina, well-developed, unbranched, tertiary venation reticulate, the smaller veins flat beneath, the areoles brownish beneath when dry; waxy glands in the axils of the basal lateral veins and of most other lateral veins; petiole 0.8–1.3 cm long, glabrous, the

epidermis flaking off; stipules 0.3–0.5 cm long, glabrous, caducous (or subpersistent). *Figs* solitary or in clusters, below the leaves minute spurs on the older wood; peduncle 1–1.3 cm long; basal bracts 1–1.5 mm long, persistent; receptacle subglobose, c. 0.7 cm diam. when dry, non-stipitate, glabrous, reddish at maturity, apex convex apiculate, ostiole c. 1 mm diam., sunken; internal hairs absent (?). *Tepals* red. *Stamens* not seen.

Distribution — Borneo (Sabah).

Notes — 1. This species, only know by the type collection, resembles *F. disticha* and *F. warburgii*; it differs from both in the longer peduncle and the subacuminate to acute apex of the lamina, and from the former also in the larger lamina.

2. Coherence of stigmas of long-styled flowers, indicated as distinctive for the species, is also found in related species, such as *F. disticha* and *F. distichoidea*.

13. Ficus grandiflora Corner

Ficus grandiflora Corner, Gard. Bull. Singapore 10 (1939) 133, t. 20, 21; 21 (1965) 60; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 236.

Root-climber. *Branchlets* drying brown; scars of the leaves ± prominent. *Leafy twigs* 2–4 mm thick, solid, glabrous. *Leaves* distichous; lamina oblong to elliptic, 8–17 by 3–9.5 cm, almost symmetric, coriaceous, apex (sub)acuminate, base mostly slightly inequilateral, cuneate to rounded, margin entire, ± revolute; upper surface glabrous, lower surface glabrous on the veins, sparsely minutely white puberulous on the rims of the areoles; cystoliths only beneath; midrib slightly prominent to flat above, lateral veins 6–9 pairs, the basal pair up to c. 1/6–1/5 the length of the lamina, close to the margin, unbranched, the other lateral veins often furcate far from the margin, tertiary venation reticulate (to subscalariform), the smaller veins (almost) flat beneath, the areoles foveolate; waxy glands in the axils of the basal lateral veins, inconspicuous; petiole 1–3 cm long, sparsely puberulous to glabrous, the epidermis flaking off; stipules (0.5–)1–1.7 cm long, keeled, glabrous, caducous. *Figs* on short spurs on the older wood, solitary; peduncle 1–2 cm long; basal bracts 3–5 mm long, persistent (or caducous?); receptacle ellipsoid, c. 5–6 cm diam. when dry, 6–7 cm diam. when fresh, glabrous, c. 2 cm long stipitate, red to purple at maturity, apex umbonate, ostiole c. 2 mm diam., slightly prominent; internal hairs abundant, short. *Tepals* red. *Stamen* 1.

Distribution — Borneo.

Habitat — Forest, at altitudes up to 1000 m.

Note — This species differs from the related species *F. densechini*, e.g., in the shorter petioles.

14. Ficus gymnorygma Summerh.

Ficus gymnorygma Summerh., J. Arnold Arbor. 22 (1941) 107; Corner, Gard. Bull. Singapore 21 (1965) 62.

Ficus scratchleyana King var. *pleiotricha* Diels, Bot. Jahrb. Syst. 67 (1935) 232.

Root-climber. *Branchlets* drying brown (to blackish); scars of the leaves ± prominent. *Leafy twigs* 3–6 mm thick, hollow, densely brown(ish) tomentose to subvillous. *Leaves* distichous; lamina oblong to subovate to elliptic, 6–20(–25) by 3–8 cm, sym-

metric, coriaceous, apex (sub)acuminate, base equilateral (or inequilateral), rounded to subcordate or to obtuse, margin entire, ± revolute; upper surface glabrous, lower surface densely brown(ish) (sub)tomentose to (very) sparsely puberulous on the veins and whitish tomentellous on the rims of the areoles; cystoliths only beneath; midrib ± impressed above, lateral veins (6–)7–10 pairs, often slightly impressed above, the basal pair up to 1/10–1/8 the length of the lamina, often weakly developed, unbranched or faintly branched, the other lateral veins often furcate far from the margin, tertiary venation reticulate (to subscalariform), the smaller veins (almost) flat beneath, the areoles foveolate; waxy glands in the axils of the basal lateral veins or also of other lateral veins; petiole 1–4 cm long, tomentose, the epidermis flaking off; stipules (0.5–)1–1.5 cm long, densely minutely puberulous to glabrous, caducous. *Figs* axillary, solitary; peduncle 0.1–0.5 cm long; basal bracts 1.5–2.5 mm long, persistent; receptacle subglobose to subpyriform, 2–3.5 cm diam. when dry, 3–4.5 cm diam. when fresh, non-stipitate or up to 0.5 cm long stipitate, densely brownish puberulous to tomentellous, orange to red at maturity, apex ± umbonate and ostiole c. 2 mm diam., often surrounded by (4 or) 5 ± stiff bracts pointing upwards, ± prominent; internal hairs rather abundant. *Tepals* pinkish to yellowish or dark red. *Stamen* 1.

Distribution — New Guinea.

Habitat — Forest, at altitudes up to 1750 m.

Notes — 1. This rather uniform species shows clear affinities to *F. scratchleyana*.

2. On the leafy twigs the minute brown trichomes are sometimes dense and form a powdery layer.

15. **Ficus peninsula** Elmer

Ficus peninsula Elmer, Leafl. Philipp. Bot. 9 (1937) 3433; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 250; Corner, Gard. Bull. Singapore 21 (1965) 60.

Ficus apiocarpa auct. non Miq.: Elmer, Leafl. Philipp. Bot. 1 (1907) 249; 2 (1908) 539; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 45.

Ficus scratchleyana auct. non King: Corner, Gard. Bull. Singapore 10 (1939) 142, t. 26, 36.

Root-climber. *Branchlets* drying brown; scars of the leaves prominent. *Leafy twigs* 3–6 mm thick, hollow, sparsely and minutely whitish puberulous to subtomentose or (sub)glabrous. *Leaves* in lax spirals to distichous; lamina oblong to subovate (or elliptic to ovate), (6–)10–20(–30) by (2.5–)5–8(–10) cm, symmetric, coriaceous, apex acuminate, base equilateral, cuneate to rounded (or to subattenuate), margin entire, ± revolute; upper surface glabrous, lower surface glabrous or very sparsely subtomentose to appressed-puberulous on the midrib, tessellate when dry; cystoliths only beneath; midrib slightly prominent above, lateral veins 6–8 pairs, the basal pair up to (1/5–)1/4–1/3 the length of the lamina, running rather close to the margin, faintly branched or unbranched, the other lateral veins rarely branched or furcate, tertiary venation reticulate to subscalariform, the smaller veins (almost) flat beneath, the areoles ± clearly brownish when dry; waxy glands in the axils of the basal lateral veins or also of some other lateral veins; petiole 2–6 cm long, puberulous to glabrous, the epidermis flaking off; stipules (1–)1.5–2.5 cm long, sparsely to densely minutely appressed-puberulous, caducous. *Figs* axillary, solitary or in pairs; peduncle 0.1–1.5 cm long; basal

bracts 1–2.5 mm long, persistent; receptacle ellipsoid (to subglobose), 1.5–2.5 cm diam. when dry, 3–4 cm diam. when fresh, 0.3–2 cm long stipitate, minutely white puberulous to subglabrous, colour at maturity unknown, apex slightly umbonate, ostiole 1–2 mm diam., ± prominent; internal hairs abundant to sparse. *Tepals* red. *Stamen* 1.

Distribution — Philippines.

Habitat — Forest, e.g., mossy forest, at altitudes up to 1000 m (or more?).

Note — This species shows clear affinities to *F. apiocarpa*, from which it differs, e.g., in the shorter and unbranched or faintly branched basal lateral veins and rarely branched or furcate other lateral veins.

16. Ficus phatnophylla Diels

Ficus phatnophylla Diels, Bot. Jahrb. Syst. 67 (1935) 222; Corner, Gard. Bull. Singapore 19 (1962) 392, t. 5; 21 (1965) 57.

Ficus phatnophylla Diels var. *glochidioides* Corner, Gard. Bull. Singapore 18 (1960) 17; 19 (1962) 392, t. 5.

Ficus meiocarpa Diels, Bot. Jahrb. Syst. 67 (1935) 221. — *Ficus phatnophylla* Diels var. *meiocarpa* (Diels) Corner, Gard. Bull. Singapore 18 (1960) 18.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 1.5–3 mm thick, solid, rather densely brown puberulous to subtomentose. *Leaves* distichous; lamina oblong to subovate to lanceolate, 6–14 by (1.5–)2–6 cm, symmetric, coriaceous, apex acuminate, the acumen shortly mucronate, base equilateral, rounded to obtuse, margin entire, ± revolute; both surfaces glabrous, the lower surface tessellate when dry; cystoliths on both sides; midrib slightly impressed to flat above, lateral veins 6 or 7 (or 8) pairs, the basal pair up to 1/6–1/4 the length of the lamina, close to the margin, unbranched, tertiary venation reticulate, the smaller (almost) flat beneath, the areoles brownish beneath when dry; cystoliths on both sides; waxy glands in the axils of the basal lateral veins, small; petiole 0.4–1 cm long, tomentose to tomentellous, the epidermis flaking off; stipules 0.3–0.6 cm long, sparsely appressed-puberulous, caducous. *Figs* axillary, solitary, in pairs or (up to 4) in clusters; with a peduncle 0.1–0.2 cm long or sessile; basal bracts 0.5–1 mm long, persistent; receptacle subglobose, 0.3–0.4 cm diam. when dry, non-stipitate, glabrous, yellow (?) at maturity, apex convex, ostiole c. 0.5 mm diam., ± sunken, sometimes surrounded by a rim; internal hairs absent. *Tepals* red. *Stamens* 2.

Distribution — New Guinea.

Habitat — Forest, at low altitudes.

Note — This species shows affinities to *F. distichoidea*, from which it clearly differs in the shortly mucronate acumen of the lamina (which is minutely retuse in *F. distichoidea*) and the smaller figs with shorter peduncles and basal bracts.

17. Ficus punctata Thunb.

Ficus punctata Thunb., Diss. Fic. (1786) 9; Lam., Encycl. 2, 2 (1788) 495; Miq., London J. Bot. 7 (1848) 440, '*punctulata*'; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268, 289; King, Sp. Ficus 2 (1888) 68, t. 88, 89; Fl. Brit. India 5 (1888) 517; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 194; Renner, Bot. Jahrb. Syst. 39 (1907) 391; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 362; Merr., Enum. Born. (1921) 225; Koord., Exk. Fl. Java 4 (1924) t. 766; Ridl., Fl. Malay Penins. 3 (1924) 338; Gagnep., Fl. Indo-Chine 5 (1928) 813; Corner, Gard. Bull. Singapore 10 (1939) 137, t. 8,

22–25, 33; Backer & Bakh.f., Fl. Java 2 (1965) 21; Corner, Gard. Bull. Singapore 21 (1965) 61; Kochummen, Tree Fl. Malaya 3 (1978) 154; Tree Fl. Sabah & Sarawak 3 (2000) 244.

Ficus falcata Thunb., Diss. Fic. (1786) 5. — *Synoecia falcata* (Thunb.) Miq., London J. Bot. 7 (1848) 470, t. 9; Pl. Jungh. (1851) 67; Fl. Ind. Bat. 1, 2 (1859) 329; Choix (1863) t. 14.

Ficus macrocarpa Blume, Cat. (1823) 36; Bijdr. (1825) 459.

Ficus elliptica Miq., London J. Bot. 7 (1848) 444, non Kunth 1817.

Synoecia falcata (Thunb.) Miq. var. *glabrior* Miq., London J. Bot. 7 (1848) 471.

Synoecia serpens Miq., Pl. Jungh. (1851) 67.

Ficus aurantiacea Griff., Notul. Pl. Asiat. 4 (1854) 394; Ic. Pl. Asiat. 4 (1854) t. 555; King, Sp. Ficus 2 (1888) 67, t. 87; Fl. Brit. India 5 (1888) 517; Renner, Bot. Jahrb. Syst. 39 (1907) 391; Ridl., Fl. Malay Penins. 3 (1924) 338; Corner, Gard. Bull. Singapore 21 (1965) 61; Backer & Bakh.f., Fl. Java 2 (1965) 21; Kochummen, Tree Fl. Malaya 3 (1978) 140; Tree Fl. Sabah & Sarawak 3 (2000) 245. — *Ficus callicarpa* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268, 289, t. 10B, '*kallicarpa*'; King, Sp. Ficus 2 (1888) 69, t. 90, 101B; Fl. Brit. India 5 (1888) 518; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 196; Renner, Bot. Jahrb. Syst. 39 (1907) 391; Koord., Exk. Fl. Java 4 (1924) t. 768; Ridl., Fl. Malay Penins. 3 (1924) 338; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1005; Corner, Gard. Bull. Singapore 10 (1939) 109, t. 8–11, 30, 31; Backer, Blumea 6 (1948) 309.

Synoecia sumatrana Miq., Fl. Ind. Bat. 1, 2 (1859) 329.

Ficus gibbosa Blume var. *pygmaea* Miq., Fl. Ind. Bat., Suppl. (1861) 431.

Ficus pomifera Kurz, J. Asiat. Soc. Bengal 42, 2 (1873) 106; Forest Fl. Burma 2 (1877) 454, non Wall. ex Miq.

Ficus megacarpa Merr., Publ. Gov. Lab. Philipp. 17 (1904) 14; Philipp. J. Sci., 1, Suppl. (1906) 46; Philipp. J. Sci., Bot. 3 (1908) 402; Elmer, Leafl. Philipp. Bot. 1 (1906) 25; 1 (1907) 248; 7 (1914) 2388; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 203, f. 1, 2; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 57; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 248.

Ficus simiae H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 362; Merr., Enum. Born. (1921) 227; Corner, Gard. Bull. Singapore 10 (1939) 145; 21 (1965) 61; C.C. Berg, Blumea 48 (2003) 552.

Ficus terasoensis Hayata, Ic. Pl. Formos. 8 (1919) 116, t. 15; Sata, J. Jap. Bot. 10 (1934) 343.

Ficus callicarpa Miq. var. *angustifolia* Corner, Gard. Bull. Singapore 10 (1939) 120, t. 12, 13, 33. — *Ficus aurantiacea* Griff. var. *angustifolia* (Corner) Corner, Gard. Bull. Singapore 18 (1960) 23.

Ficus callicarpa Miq. var. *parvifolia* Corner, Gard. Bull. Singapore 10 (1939) 116, t. 32. — *Ficus aurantiacea* Griff. var. *parvifolia* (Corner) Corner, Gard. Bull. Singapore 18 (1960) 23.

Ficus megacarpa Merr. var. *angustifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 249.

Ficus megacarpa Merr. var. *angustifolia* Sata subvar. *leptocrassiusculifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 249.

Ficus megacarpa Merr. var. *angustifolia* Sata subvar. *tenuilongifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 249.

Ficus megacarpa Merr. var. *rotundifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 249.

Ficus megacarpa Merr. var. *rotundifolia* Sata subvar. *rotundicrassiusculifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 249.

Ficus megacarpa Merr. var. *rotundifolia* Sata subvar. *rotunditenuifolia* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 249.

Root-climber. *Branchlets* drying brown (to blackish). *Leafy twigs* 1–3 mm thick, solid, sparsely to rather densely minutely whitish to brownish puberulous to subtomentose. *Leaves* distichous; oblong to elliptic to subobovate to obovate to falcate (to lanceolate or to suborbicular), (0.5–)1–12 by (0.2–)0.5–7.5 cm, ± asymmetric or symmetric, coriaceous, apex rounded to obtuse or to 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, ± revolute (at least towards the base); upper

surface glabrous, lower surface sparsely puberulous to substrigillose to glabrous on the main veins, sparsely minutely puberulous on the rims of the (small) areoles; cystoliths only beneath; midrib (almost) flat to slightly prominent (or slightly impressed), lateral veins 3–6 pairs, the basal pair up to 1/6–1/3 the length of the lamina, unbranched, other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller veins (almost) flat 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 up to 10 cm long leafless branchlets with short internodes, solitary, sessile or with a peduncle up to 2 cm long; basal bracts 3–5 mm long, persistent; receptacle subglobose to pyriform to ellipsoid, (1.5–)3–5(–10) cm diam. when dry, if pyriform to ellipsoid, then up 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 to orange to pinkish to scarlet to black at maturity, apex ± umbonate, 3–5 mm diam., prominent to flat, often surrounded by 3–5 stiff bracts pointing upwards; internal hairs abundant. *Tepals* red. *Stamen* 1.

Distribution — SE Asia (Nicobar Islands, Myanmar, Indochina, Taiwan, Thailand) and Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines, Celebes, Lesser Sunda Islands (Bali, Lombok, Sumbawa, Flores, Alor, Timor), Moluccas (Morotai, Ceram, Ambon).

Habitat — Forest, at altitudes up to 1500 m.

Note — The two species, *F. punctata* and *F. aurantiacea*, as recognized by Corner (1960, 1965) lack sufficient and consistent differentiating characters and are, therefore, here united. The variation patterns suggest that features of the bathyphyll-state are largely retained in the majority of the collections, which have leaves with asymmetric laminas (similar in shape to those of the true bathyphylls, but with coriaceous texture and foveolate areoles), short petioles, and subpersistent stipules. A smaller number of collections may represent the true acrophyll-state, characterized by leaves with (almost) symmetric laminas cuneate at the base, relatively long petioles, and mostly caducous stipules. Intermediate features occur in many collections. On the basis of the variation patterns of the vegetative parts, two major informal entities can be distinguished (each of them with two or more subforms). The indumentum of the fig receptacles tend to be different for the two entities and could be related to the difference in denseness of indumentum between the bathyphyll-state and acrophyll-state.

a. '*punctata*-form' — *Lamina* small, 0.5–5 by 0.2–2.5 cm, distinctly asymmetric, apex rounded, base inequilateral, the broad side subauriculate; waxy gland usually 1, in the axil of the basal lateral vein at the broad side of the lamina; petiole short, 0.1–0.5 cm long; stipules 0.2–0.7 cm long, subpersistent. *Fig* receptacle usually densely hairy.

   In some collections the lamina is always small, usually up to 2 cm long, in others they are mostly larger, up to 5 cm long. Some of the collections have elliptic to obovate laminas, whereas others mostly oblong to subobovate ones.

b. '*aurantiacea*-form' — *Lamina* larger, mostly 3–12 by 2–7.5 cm, symmetric or slightly asymmetric, apex shortly and bluntly acuminate to obtuse to rounded, base (sub)cuneate; waxy glands usually 2, in the axils of both basal lateral veins; petiole 0.5–1.5(–2) cm long; stipules 0.5–1.5 cm long, often caducous. *Fig* receptacle often sparsely hairy.

Three subforms can be distinguished: one with relatively large elliptic laminas, 5–12 by 3–7.5 cm (Sumatra, Malay Peninsula, Borneo, also in Thailand), the other with smaller elliptic laminas, 3–6 by 2–3.5 cm (widespread), and the third with oblong (to lanceolate) laminas (widespread). Among collections of the latter two subforms transitions to or asymmetric laminas are common.

18. **Ficus ruginervia** Corner

Ficus ruginervia Corner, Gard. Bull. Singapore 18 (1960) 24; 21 (1960) 61; Kochummen, Tree Fl. Malaya 3 (1978) 155; Tree Fl. Sabah & Sarawak 3 (2000) 248.
Ficus callicarpa Miq. var. *crassinervia* Corner, Gard. Bull. Singapore 10 (1939) 118, t. 33.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 1–2 mm thick, solid, brownish to whitish puberulous to subtomentose. *Leaves* distichous; lamina elliptic to oblong to ovate to subovate, (1–)2–5(–8) by (0.5–)1–3.5(–5) cm, ± asymmetric, coriaceous, apex rounded to obtuse, minutely retuse, initially with some hairs in the notch, base mostly inequilateral, the broad side rounded to subauriculate, the narrow side

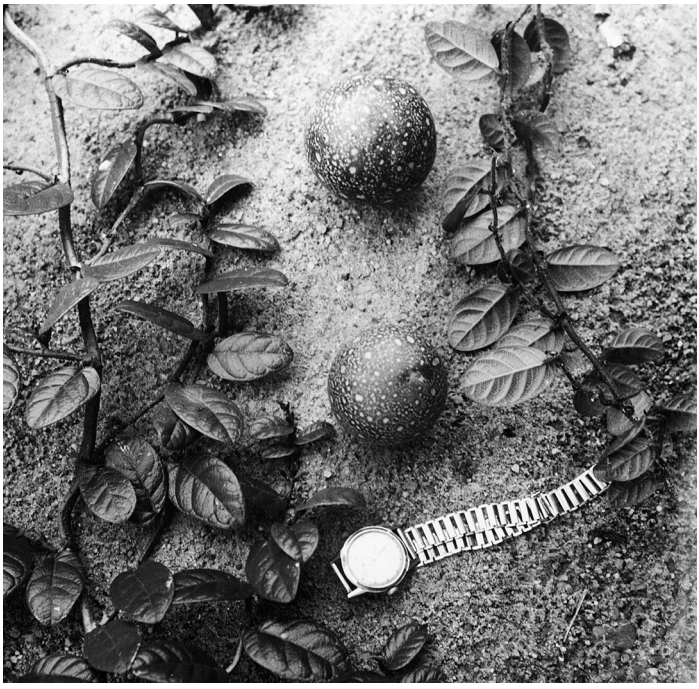

Fig. 95. *Ficus ruginervia* Corner. Leafy twigs and figs, Sumatra, Harau. Photo W. Meijer.

rounded to obtuse, if equilateral, then cordulate to rounded, margin entire, revolute; upper surface glabrous, lower surface sparsely puberulous to strigillose to subhispidulous on the main veins to glabrous, sparsely minutely puberulous on the rims of the areoles, smooth or scabridulous; cystoliths only beneath; midrib impressed, also the lateral veins often ± impressed above, lateral veins (3–)4–7 pairs, the basal lateral veins of the broad side of the lamina up to 1/5–1/3(–1/2) the length of the lamina, branched, other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller veins (almost) flat beneath, the areoles foveolate; waxy glands in the axils of the basal lateral veins at the broad side of the lamina, mostly conspicuous, or sometimes also glands in the axils of the basal lateral veins at the narrow side of the lamina or in the axils of other lateral veins; petiole 0.2–1 cm long, puberulous, the epidermis flaking off; stipules 0.2–0.8 cm long, sparsely and minutely appressed-puberulous, subpersistent or caducous. *Figs* cauliflorous on up to 1.5 cm long leafless branchlets with short internodes or axillary, solitary; peduncle 0.3–0.5 cm long; basal bracts 1–3 mm long, persistent; receptacle subglobose to pyriform, 1–4 cm diam. when dry, 2–5 cm diam. when fresh, 0.2–1 cm long stipitate, sparsely to rather densely whitish to brownish puberulous, orange to red to blackish at maturity, apex ± umbonate to apiculate, ostiole c. 2 mm diam., ± prominent; internal hairs absent. *Tepals* red. *Stamen* 1. — **Fig. 95.**

Distribution — Sumatra, Malay Peninsula, Borneo.

Habitat — In forest as a climber (or on rocks as a creeper); altitudes up to 1500 m.

Note — This rather uniform species is closely related to *F. punctata*; it differs from the '*punctata*-form' mainly in the more thickly coriaceous lamina with the main veins ± impressed above.

19. Ficus sarawakensis Corner

Ficus sarawakensis Corner, Blumea 20 (1972) 427; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 247.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–3 mm thick, solid, whitish puberulous to subhispidulous. *Leaves* distichous; lamina lanceolate, 9–15 by 2.5–4, (almost) symmetric, coriaceous, apex acuminate, base equilateral, obtuse and auriculate, margin revolute; upper surface (sub)glabrous, ± bullate, lower surface puberulous to subhispidulous to subtomentose on the main veins, sparsely minutely puberulous on the rims of the areoles, scabridulous; cystoliths only beneath; midrib deeply impressed, also other veins ± impressed, lateral veins 9–12 pairs, the basal pair up to c. 1/20–1/10 the length of the lamina, short, unbranched, other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller veins prominent beneath, the areoles foveolate; waxy glands in the axils of the basal lateral veins; petiole 1–2.2 cm long, puberulous to subhispidulous, the epidermis flaking off; stipules 0.6–1 cm long, sparsely appressed-puberulous, caducous (or subpersistent as on the fig-bearing spurs). *Figs* cauliflorous on up to 4 cm long spurs with subpersistent stipules, solitary; peduncle 0.1–0.5 cm long; basal bracts 1–2 mm long, persistent; receptacle subglobose, 1.3–2 cm diam. when dry, 0.3–1.2 cm long stipitate, sparsely brownish puberulous, yellow (?) at maturity, apex umbonate, ostiole c. 1 mm diam., surrounded by a low rim; internal hairs sparse. *Tepals* red. *Stamen* 1.

Distribution — Borneo (Sarawak).

Habitat — Forest, at altitudes up to c. 1300 m.

Note — This species shows affinities to *F. tulipifera*, from which it differs in the narrower lamina with the venation impressed above.

20. Ficus scratchleyana King

Ficus scratchleyana King, J. Asiat. Soc. Bengal 55, 2 (1887) 404; Sp. Ficus 2 (1888) App. 5, t. 229A; Diels, Bot. Jahrb. Syst. 67 (1935) 231; Summerh., J. Arnold Arbor. 22 (1941) 107; Corner, Gard. Bull. Singapore 21 (1965) 61.

Ficus scratchleyana King var. *aurantiola* Corner, Gard. Bull. Singapore 18 (1960) 23.

Ficus scratchleyana King var. *rhopalosycia* (Diels) Corner, Gard. Bull. Singapore 18 (1960) 24. — *Ficus rhopalosycia* Diels, Bot. Jahrb. Syst. 67 (1935) 232; Philos. Trans., Ser. B, 273 (1976) 385.

Root-climber. *Branchlets* drying brown; scars of the leaves ± prominent. *Leafy twigs* (1.5–)2.5–5 mm thick, hollow or solid, very sparsely whitish to brownish puberulous to glabrous. *Leaves* distichous; lamina oblong to subovate to elliptic (to ovate or to lanceolate), (3–)5–20(–25) by (1.5–)2–10(–13) cm, symmetric (or slightly asymmetric), coriaceous, apex (sub)acuminate, base equilateral (or inequilateral), rounded to subcordate or to obtuse, margin entire, ± revolute; both surfaces subglabrous (only with minute brown trichomes); cystoliths only beneath; midrib ± impressed above, lateral veins (6–)7–9(–10) pairs, the basal pair up to 1/10–1/8 the length of the lamina, often weakly developed, unbranched or faintly branched, the other lateral veins often furcate far from the margin, tertiary venation reticulate (to subscalariform), the smaller veins (almost) flat beneath, the areoles foveolate; waxy glands in the axils of the basal lateral veins, often inconspicuous; petiole 1–4(–10) cm long, (sub)glabrous, the epidermis flaking off; stipules (0.5–)1–2 cm long, densely minutely puberulous to glabrous, caducous. *Figs* axillary, solitary or in pairs; peduncle 0.2–1 cm long; basal bracts 1.5–2.5(–3) mm long, persistent; receptacle subglobose (and non-stipitate) and 0.7–1.5 cm diam. when dry or pyriform (and stipitate) and 8–10 by 3–4.5 cm when dry, minutely whitish puberulous to (sub)glabrous, yellow to orange (or brown) at maturity, apex ± umbonate and ostiole (1–)1.5–2 mm or c. 3 mm diam., often surrounded by 5 ± stiff ± prominent upwards pointing bracts; internal hairs absent. *Tepals* whitish, pinkish, or red. *Stamen* 1. *Fruits* slightly or not compressed, surrounded by a faint margin or not.

Distribution — New Guinea.

Habitat — Forest, at altitudes up to c. 2350 m.

Notes — 1. The species is rather variable. Most collections have subglobose fig receptacles up to 1.5 cm when dry, but some collections have large (8–10 cm long) pyriform receptacles. The latter collections match the description of *F. rhopalosycia* by Diels (1935), recognized as a variety of *F. scratchleyana* by Corner (1960), as they do not differ in the characters of twigs and leaves from the common form with smaller subglobose fig receptacles.

2. The type of *F. scratchleyana* var. *aurantiola* (*Aet & Idjan 916* from Biak) has slender leafy twigs and small laminas (3–7 by 1.5–3 cm). As some of these leaves are more or less asymmetric, at least at the base, the collection may represent a state transitional to the bathyphyll one.

3. Similar to the related *F. gymnorygma*, the colour of the tepals varies from whitish to pinkish or to red. The fruits are sometimes (only in large figs) not compressed and not surrounded by a rim.

4. The minute brown trichomes on the leafy twigs are sometimes so dense that they form a powdery layer.

21. Ficus singalana King

Ficus singalana King, Sp. Ficus 2 (1888) 70, t. 91; Corner, Gard. Bull. Singapore 10 (1939) 146; 21 (1965) 61.
Ficus callicarpa Miq. var. *multinervia* Corner, Gard. Bull. Singapore 10 (1939) 119, t. 34.

Root-climber. *Branchlets* drying dark brown. *Leafy twigs* 2–3 mm thick, solid, brownish subtomentose to subvillous. *Leaves* distichous; lamina oblong to elliptic, 7–12 by 4–6.5, symmetric (or slightly asymmetric), coriaceous, apex acuminate, base (almost) equilateral, cuneate to rounded, margin entire, revolute; upper surface glabrous, lower surface very sparsely minutely appressed-puberulous on the main veins, densely tomentellous on the rims of the areoles; cystoliths only beneath; midrib and lateral veins impressed above, lateral veins 6–9 pairs, the basal pair up to 1/6–1/4 the length of the lamina, (faintly) branched, other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller veins (almost) flat beneath, the areoles foveolate; waxy glands in the axils of the basal lateral veins; petiole 1.5–2.5 cm long, puberulous, the epidermis flaking off; stipules 1–1.8 cm long, very sparsely minutely puberulous, caducous. *Figs* cauliflorous (?), solitary; peduncle up to 2 cm long; basal bracts 3–5 mm long, persistent; receptacle ellipsoid, c. 7 cm diam. when dry, up to 1 cm long stipitate, glabrous, pinkish at maturity, apex and ostiole not seen; internal hairs absent. *Tepals* red. *Stamen* 1.

Distribution — Sumatra (northern and central).

Habitat — Montane forest.

Note — Material referred to this species might represent the true acrophyll-state of *F. ruginervia*.

22. Ficus sohotonensis C.C. Berg

Ficus sohotonensis C.C. Berg, Blumea 48 (2003) 561.

Root-climber. *Branchlets* drying brown; scars of the leaves prominent. *Leafy twigs* 2–7 mm thick, solid, brownish puberulous to subtomentose to subvillous. *Leaves* in lax spirals to distichous; lamina oblong to lanceolate, 11–31 by 3–8.5 cm, symmetric, coriaceous, apex acuminate, base (almost) equilateral, obtuse to narrowly truncate, margin entire, ± revolute; upper surface glabrous, lower surface (sparsely) subtomentose to pilose on the (main) veins, tessellate when dry; cystoliths only beneath; midrib slightly prominent to flat above, lateral veins 10–14 pairs, the basal pair up to 1/20–1/10 the length of the lamina, poorly developed, running rather close to the margin, (faintly) branched or unbranched, the other lateral veins often branched or furcate, tertiary venation (sub)scalariform, the smaller veins (almost) flat beneath, the areoles ± clearly

brownish when dry; waxy glands in the axils of the basal lateral veins or also of some other lateral veins; petiole 2–7.5 cm long, subtomentose to subvillous, the epidermis flaking off; stipules 1.5–2.5 cm long, sparsely, but along the margin densely minutely appressed-puberulous, and on the keel and the apex brown strigillose, (sub)persistent. *Figs* on short leafy twigs, terminated with a tuft of persistent stipules, solitary; peduncle 0.1–0.2 cm long; basal bracts c. 2 mm long, persistent; receptacle ellipsoid, 2–3.5 cm diam. when dry, up to 0.5 cm long stipitate, sparsely brownish puberulous to substrigillose, reddish at maturity, apex convex, ostiole c. 2 mm diam., ± prominent; internal hairs absent. *Tepals* red. *Stamens* 1 (or 2).

Distribution — Philippines (Samar).

Habitat — Forest, at low altitudes.

Note — This species belongs to the set of species including *F. apiocarpa* and *F. peninsula*. It is distinct in the numerous lateral veins, in the persistent stipules with a conspicuously hairy keel, and probably also in the figs, not born in leaf axils.

23. **Ficus submontana** C.C. Berg

Ficus submontana C.C. Berg, Blumea 48 (2003) 563.

Root-climber. *Branchlets* drying brown; scars of the petioles prominent. *Leafy twigs* 3–7 mm thick, solid, whitish puberulous to subtomentose. *Leaves* in lax spirals to distichous; lamina oblong to elliptic to subovate, 9–21 by 4.5–10 cm, symmetric, coriaceous, apex acuminate, base equilateral or slightly inequilateral, cuneate to rounded, often subauriculate, margin entire, revolute; upper surface glabrous, lower surface glabrous or very sparsely subtomentose on the midrib, tessellate when dry; cystoliths only beneath; midrib flat to slightly impressed above, lateral veins 8–10 pairs, the basal pair up to c. 1/10–1/5 the length of the lamina, poorly developed, running rather close to the margin, (faintly) branched or unbranched, the other lateral veins often branched or furcate, tertiary venation (sub)scalariform, the smaller veins (almost) flat beneath, the areoles ± clearly brownish when dry; waxy glands in the axils of the basal lateral veins or also of some other lateral veins; petiole 1.5–3.5 cm long, sparsely puberulous to subtomentose to glabrous, the epidermis flaking off; stipules 1.5–2.2 cm long, densely minutely appressed-puberulous, caducous. *Figs* axillary, solitary or in pairs; peduncle 0.1–0.2 cm long; basal bracts c. 2 mm long, persistent; receptacle ellipsoid, c. 1.5–2.5 cm diam. when dry, substipitate, densely brownish puberulous to subvelutinous, reddish (?) at maturity, apex protracted, c. 1–2 mm diam., ± prominent; internal hairs absent. *Tepals* red. *Stamen* 1.

Distribution — Celebes (northern and central).

Habitat — Submontane forest, at altitudes of 1000–1200 m.

Note — This species is closely related to *F. peninsula* (from the Philippines), from which it differs in the more numerous lateral veins, of which the basal pair is usually poorly developed and up to c. 1/5 the length of the lamina, and in the densely hairy fig receptacle with a protracted apex. Considering the nature of the differences between *F. peninsula* and *F. apiocarpa*, it appears to be justified to establish another species related to both.

24. Ficus trachycoma Miq.

Ficus trachycoma Miq. in Zoll., Syst. Verz. 2 (1854) 92; Fl. Ind. Bat. 1, 2 (1859) 304; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293; Corner, Gard. Bull. Singapore 10 (1939) 148, t. 32; Backer, Blumea 6 (1948) 309; Backer & Bakh.f., Fl. Java 2 (1965) 21; Corner, Gard. Bull. Singapore 21 (1965) 60.
Ficus asperrima Teijsm. & Binn., Ned. Kruidk. Arch. 3 (1855) 402, non Roxb. 1832.
Ficus aurantiaca auct. non Griff.: Koord., Exk. Fl. Java 4 (1924) t. 767.

Root-climber. *Branchlets* drying brown; scars of the leaves ± prominent. *Leafy twigs* 3–6 mm thick, hollow or solid, very sparsely minutely puberulous to hispidulous. *Leaves* distichous; lamina elliptic to oblong to (sub)ovate, 4–12 by 2.5–7 cm, symmetric (or asymmetric), coriaceous, apex shortly and bluntly acuminate to obtuse or to subacute, base (almost) equilateral, rounded to obtuse or to cordulate, margin entire, ± revolute; upper surface coarsely hispidulous, scabrous, lower surface coarsely hispidulous, scabrous, minutely white puberulous on the rims of the areoles; cystoliths only beneath; midrib almost flat above, lateral veins 7–10 pairs, the basal pair up to c. 1/10–1/4 the length of the lamina, faintly branched, the other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller veins (almost) flat beneath, the areoles foveolate; waxy glands in the axils of the basal lateral veins, inconspicuous; petiole 0.5–1.5 cm long, puberulous to hispidulous, the epidermis flaking off; stipules (0.5–)1–1.5 cm long, minutely appressed-puberulous, caducous. *Figs* axillary, solitary; peduncle 0.2–0.3 cm long; basal bracts c. 2 mm long, persistent; receptacle subglobose, c. 3.5–4 cm diam. when dry, 0.7–1.1 cm long stipitate, hispidulous, scabrous, orange to red at maturity, apex and ostiole not seen; internal hairs absent. *Tepals* pinkish. *Stamen* 1.

Distribution — Java (western).

Habitat — Forest, at low altitudes.

Note — This rare species is distinct by the scabrous upper and lower surface of the lamina, caused by (very) short hairs.

25. Ficus tulipifera Corner

Ficus tulipifera Corner, Gard. Bull. Singapore 10 (1939) 150, t. 28, 29, 35; 21 (1965) 62; Blumea 20 (1972) 429; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 235.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–4 mm thick, solid, glabrous (or brownish hirtellous to puberulous). *Leaves* distichous; lamina oblong to lanceolate, 10–21 by 4.5–8 cm, slightly asymmetric (at least at the base) to almost symmetric, coriaceous, apex acuminate, base ± inequilateral to almost equilateral, if inequilateral, then one (the broad) side often slightly decurrent and (sub)auriculate, the narrow side cuneate to rounded, if equilateral, then subcordate (or obtuse to cuneate), margin entire, revolute; upper surface sparsely puberulous to hirtellous on the main veins and glabrescent or glabrous, sometimes scabridulous, lower surface sparsely pilose to subhispid on the main veins to (sub)glabrous, (sparsely) minutely puberulous on the rims of the areoles, scabridulous or smooth; cystoliths only beneath; midrib slightly prominent above, at least the upper part, the lower part sometimes in a depression, lateral veins 6–11 pairs, the basal pair up to c. 1/10–1/3 the length of the lamina, branched or unbranched, other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller

veins ± prominent beneath to flat, the areoles foveolate; waxy glands in the axils of the basal lateral veins or also of other lateral veins; petiole 1.5–3 cm long, glabrous (or hirtellous to puberulous), the epidermis flaking off; stipules 0.4–1(–1.5) cm long, glabrous, caducous or subpersistent, always subpersistent on the fig-bearing spurs. *Figs* on up to 10 cm long spurs or to c. 20 cm long (branched or unbranched) up to 20 cm long branchlets with up to 1.2 cm long subpersistent stipules (at the apex or apices), solitary; peduncle 0.2–1.5 cm long; basal bracts 2–4 mm long, persistent; receptacle subglobose to ellipsoid, c. 1.5–2.5 cm diam. when dry, 0.2–0.4 cm long stipitate, whitish puberulous to subglabrous, orange to red at maturity, apex slightly umbonate, ostiole c. 2 mm diam., slightly sunken; internal hairs rather abundant to absent. *Tepals* red. *Stamen* 1. *Stigmas* of short-styled flowers (always?) subpeltate.

Distribution — Borneo (Brunei, E and C Kalimantan, Sarawak).

Habitat — Lowland forest.

Notes — 1. This species shows affinities to both *F. carrii* and *F. sarawakensis*.

2. The single collection from C Kalimantan (*Church et al. 902*) differs from the others in the hairy petioles and leafy twigs, the obtuse to cuneate base of the lamina, stipules becoming up to 1.5 cm long, and the midrib prominent in a depression.

26. Ficus warburgii Elmer

Ficus warburgii Elmer, Leafl. Philipp. Bot. 1 (1907) 247; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 68; Elmer, Leafl. Philipp. Bot. 9 (1937) 3435; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 340; Corner, Gard. Bull. Singapore 21 (1965) 60.

Root-climber. *Branchlets* drying brown; scars of the leaves prominent. *Leafy twigs* 1.5–2.5 mm thick, solid, minutely whitish to brownish puberulous to subtomentose. *Leaves* in lax spirals to distichous; lamina oblong to elliptic, 3–7.5 by 1–4 cm, symmetric, coriaceous, apex shortly and bluntly acuminate to rounded, mostly minutely retuse, base equilateral, obtuse to cuneate, margin entire, slightly revolute (towards the base); both surfaces glabrous, the lower surface tessellate when dry; cystoliths only beneath; midrib slightly prominent above, lateral veins 5–8(–10) pairs, the basal pair up to 1/10–1/3 the length of the lamina, often weakly developed, close to the margin, unbranched, tertiary venation reticulate, the smaller veins (almost) flat beneath, the areoles ± clearly brownish when dry; waxy glands in the axils of the basal lateral veins (only if these veins are well-developed), minute ones in the axils of other lateral veins, or often absent; petiole (0.8–)1–2.5 cm long, 1–1.5 mm thick, (sub)glabrous, the epidermis flaking off; stipules 0.5–1 cm long, (sub)glabrous, caducous. *Figs* axillary, or just below the leaves, solitary or in pairs, sessile or with a peduncle up to 0.3 cm long; basal bracts c. 1.5 mm long, persistent; receptacle subglobose, 0.7–1 cm diam. when dry, 0.4–1.2 cm long stipitate, (sub)glabrous, colour at maturity unknown, apex convex to slightly umbonate, 1–2 mm diam., slightly prominent; internal hairs sparse and short. *Tepals* red. *Stamen* 1.

Distribution — Philippines (Luzon, Mindanao, Samar).

Habitat — Montane forest.

Note — This species shows affinities to both *F. distichoidea* from New Guinea and to *F. detonsa* from Borneo.

Section Rhizocladus

Ficus L. subg. *Synoecia* (Miq.) Miq. sect. *Rhizocladus* Endl., Gen. Pl., Suppl. 4, 2 (1848) 34; Corner, Gard. Bull. Singapore 18 (1960) 3 (sub subg. *Ficus*).
Varinga Raf., Sylv. Tellur. (1838) 58.
Tenorea Gasp., Giorn. Bot. Ital. 2 (1844) 214; Rendiconte Reale Accad. Sci. Fis. 25 (1845) 81; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 342.

Lamina of the acrophylls (usually) symmetric, the lower surface mostly not foveolate (or if tessellate then only faintly so). *Figs* mostly axillary, just below the leaves, or (clustered) on short spurs on the older wood (ramiflorous), the receptacle often small, the basal bracts persistent or caducous. *Staminate* and *neuter flowers* scattered among the pistillate ones or near the ostiole, usually (sub)sessile. *Stamens* 2 (or 3), the anthers lanceolate to oblong in outline, usually mucronate. *Tepals* of the pistillate flowers subovate to elliptic to oblong to subobovate, red. *Ovaries* of short-styled flower red(dish).

Distribution — The section comprises about 40 species in an area from Sri Lanka to Korea, Japan, the Carolines, the Solomon Islands, and N Australia. About 50% are eastern Malesian and the others about equally divided over the western Malesian and the Sino-Himalayan regions.

Morphology — This section is morphologically more varied than sect. *Kissosycea*. Foveolate lower surfaces of the lamina are confined to a few species.

Subdivision — Within this section, four subsections can be distinguished.

Section Rhizocladus subsection Plagiostigma

Ficus L. subg. *Synoecia* (Miq.) Miq. sect. *Rhizocladus* Endl. subsect. *Plagiostigma* (Siebold & Zucc. ex Miq.) C.C. Berg, Blumea 48 (2003) 553. — *Plagiostigma* Siebold & Zucc., Abh. Ak. Münch. 4, 1 (1844) 154, nom. nud., non Presl. 1844; Fl. Jap. Fam. Nat. 1 (1845) 222, nom. nud.; 2 (1846) 98, nom. nud.; Benth. & Hook.f., Gen. Pl. 3 (1880) 224, nom. in synon. — *Ficus* L. sect. *Plagiostigma* Siebold & Zucc. ex Miq., London J. Bot. 7 (1848) 436; Fl. Ind. Bat. 1, 2 (1859) 316. — *Ficus* L. subg. *Plagiostigma* (Siebold & Zucc. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294. — *Ficus* L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Plagiostigmaticae* (Siebold & Zucc. ex Miq.) Corner, Gard. Bull. Singapore 18 (1960) 3.

Indumentum consisting of ± soft straight or crinkled hairs without swollen bases. *Leafy twigs* eglandular. *Leaves* differentiated into bathyphylls and acrophylls, spirally arranged (or acrophylls in lax spirals); lamina of acrophyll symmetric (or slightly asymmetric); petiole short. *Figs* axillary; internal hairs rather sparse and whitish to abundant and brownish. *Staminate flowers* ostiolar. *Tepals* red, glabrous or hairy at the apex. *Stamens* 2 (or 3); filaments free, anthers oblong in outline. *Fruits* compressed and keeled or hardly compressed and not keeled.

Distribution — With c. 10 species; ranging from India through China and northern Indochina to Korea, Japan, and Taiwan. In *Malesia* only *F. pubigera* (Malay Peninsula) and *F. pumila* in cultivation.

Notes — 1. Corner recognized three species in this subdivision (see Gard. Bull. Singapore 21 (1965) 50, 52), *F. pubigera*, *F. pumila,* and *F. sarmentosa*, from which

F. impressa Champ. ex Benth. is excluded and to be reinstated as a species. Chang (Guahaia 3 (1983) and 4 (1984)) described a number of additional species. It is not yet clear whether they have to be put into the synonymy of *F. sarmentosa* or whether they are satellite species.

2. *Ficus pumila* and *F. sarmentosa* show similarities to the *F. punctata*-group of sect. *Kissosycea*, in the habit, the foveolate lower surface of the lamina, and the shape and size of the fig receptacle, such as can be found in *F. scratchleyana* (from New Guinea). *Ficus pumila* has the typical *Synoecia* fruits, compressed and keeled, but the other species not. *Ficus pubigera* has sometimes hairs on the apices of the tepals whereas hairs are lacking on flowers of all other species of subg. *Synoecia*. In the very variable species *F. sarmentosa*, the lower surface of the lamina varies from deeply foveolate (as in *F. pumila)* to shallowly foveolate, as found in the *F. punctata*-group of sect. *Kissosycea*.

27. Ficus pubigera (Wall. ex Miq.) Miq.

Ficus pubigera (Wall. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; Kurz, Forest Fl. Burma 2 (1877) 450; Kochummen, Tree Fl. Malaya 3 (1978) 153. — *Pogonotrophe pubigera* Wall. ex Miq., London J. Bot. 7 (1848) 76; Corner, Gard. Bull. Singapore 21 (1965) 50.

Pogonotrophe verrucosa Miq., London J. Bot. 7 (1848) 77, t. II A; King, Sp. Ficus 2 (1888) t. 166D. — *Ficus verrucosa* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295, in synon. sub *F. nemoralis*, non Vahl 1805.

Ficus erecta Thunb. var. *khasiana* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294.

Ficus howii Merr. & Chun, Sunyatsenia 5 (1940) 43.

Root-climber. *Branchlets* drying (dark) brown. *Leafy twigs* 1.5–3 mm thick, sparsely to densely (white to) brown appressed-puberulous to tomentose to villous, with some conspicuous lenticels below the nodes. *Leaves* spirally arranged to distichous; lamina oblong to subovate (to lanceolate), (5–)10–25(–30) by (2–)4–10 cm, (almost) symmetric, subcoriaceous to coriaceous, apex acuminate, base (almost) equilateral, cuneate to rounded (to subcordate), margin entire; upper surface glabrous or sparsely subtomentose, lower surface sparsely to densely tomentose to (sub)villous or to appressed-pubescent to -puberulous, on all veins or mainly on the main ones; cystoliths only beneath; midrib reaching the apex, lateral veins 8–12 pairs, the basal pair up to c. 1/5–1/3 the length of the lamina, faintly branched, tertiary venation (sub)reticulate, the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins; petiole (0.2–)0.8–1.5(–2) cm long, brownish appressed-puberulous to -pubescent to tomentose to villous, the epidermis ± flaking off (or persistent?); stipules 0.5–1.5 cm long, brownish hirtellous to subsericeous or to subvillous, caducous. *Figs* axillary, solitary (or in pairs), (sub)sessile; basal bracts 1.5–4 mm long, persistent; receptacle (sub)globose, 1–2 cm diam. when dry, c. 1.5–2 cm diam. when fresh, sparsely to densely brown(ish) (sub)tomentose, often ± pustulate by lenticels, greenish at maturity, apex ± umbonate, ostiole c. 2 mm diam.; internal hairs abundant, long, stiff, and brownish. *Tepals* red, those of pistillate flowers sometimes hairy at the apex. *Stamens* 2.

Distribution — Continental Asia (India, Nepal, Myanmar, S China, Indochina, Thailand); in *Malesia*: Malay Peninsula (Pahang).

Habitat — Montane forest, at altitudes between 900 and 1400 m.

Note — The species is rather variable. The typical form is represented in Malesia. Distinct forms with larger figs and/or leaves (var. *anserina* Corner and var. *maliformis* (King) Corner) co-occur with the typical form in the northern part of the range of distribution of the species.

28. Ficus pumila L.

Ficus pumila L., Sp. Pl. (1753) 1060; Burm.f., Fl. Ind. (1768) 226; Thunb., Fl. Jap. (1784) 33; Diss. Fic. (1786) 8; Lam., Encycl. 2, 2 (1788) 497; Miq., Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 199, 294; Hook., J. Bot. Mag. 108 (1882) t. 6657; King, Sp. Ficus 2 (1888) 124, t. 158; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 465; Renner, Bot. Jahrb. Syst. 39 (1907) 400; Trülzsch, Jahrb. Syst. Wiss. Bot. 54 (1914) 1; Koord., Exk. Fl. Java 4 (1924) t. 769; Gagnep., Fl. Indo-Chine 5 (1928) 793; Hand.-Mazz., Symb. Sin. 7 (1929) 94; L.H. Bailey, Cyclop. (1935) f. 1501; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 45; Corner, Gard. Bull. Singapore 21 (1965) 52; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 148.

Ficus stipulata Thunb., Diss. Fic. (1786) 8; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 242; Miq., London J. Bot. 7 (1848) 439; J. Bot. Néerl. 1 (1861) 243; Benth., Fl. Hongk. (1861) 328.

Ficus scandens Lam., Encycl. 2, 2 (1788) 498.

Ficus vestita Desf., Cat. Hort. Paris, ed. 3 (1829) 346, 413.

Varinga repens Raf., Sylv. Tellur. (1838) 58.

Tenorea heterophylla Gasp., Giorn. Bot. Ital. 2 (1844) 214.

Ficus hanceana Maxim., Bull. Acad. Imp. Sci. Saint-Pétersbourg 11 (1883) 341.

Ficus pumila × *carica* Condit, J. Hered. 41 (1950) 165.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–5 mm thick, brownish tomentose to villous. *Leaves* distichous (or in lax spirals); lamina elliptic to oblong to (sub)ovate, 2–10 by 1–6 cm, (almost) symmetric, 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 to subtomentose on the smaller ones; cystoliths only beneath; midrib often not reaching the apex, lateral veins 4–6 pairs, the basal pair up to 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 in the 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 ± umbonate, ostiole c. 3 mm diam.; internal hairs abundant. *Tepals* red. *Stamens* 2 or 3.

Distribution — Continental Asia (Korea, Japan, Ryukyu Islands, Taiwan, China, Indochina); in *Malesia*: cultivated, often as creeper on walls.

Uses — Ornamental.

Note — Bathyphylls distichous; lamina (sub)ovate, 1–3.5 by 0.7–2 cm, asymmetric, obtuse; petiole 0.1–0.4 cm long; stipules 0.2–0.5 cm long, (sub)persistent.

Section Rhizocladus subsection Pogonotrophe

Ficus L. subg. *Synoecia* (Miq.) Miq. sect. *Rhizocladus* Endl. subsect. *Pogonotrophe* (Miq.) C.C. Berg, Blumea 48 (2003) 553. — *Pogonotrophe* Miq., London J. Bot 6 (1847) 525; 7 (1848) 72; Fl. Ind. Bat. 1, 2 (1859) 329. — *Ficus* L. subg. *Pogonotrophe* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293. — *Ficus* L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Plagiostigmaticae* (Siebold & Zucc. ex Miq.) Corner subser. *Pogonotropheae* Corner, Gard. Bull. Singapore 18 (1960) 4.

Indumentum consisting of ± soft straight or crinkled hairs without swollen bases. *Leafy twigs* with a pair of subnodal waxy glands below the petioles. *Leaves* not clearly differentiated into bathyphylls and acrophylls, spirally arranged; lamina symmetric; petiole long. *Figs* axillary (or cauliflorous); internal hairs abundant, stiff, long (at anthesis as long as the pistillate flowers, and separating the stigmas), brownish. *Staminate flowers* near the ostiole. *Tepals* red, glabrous. *Stamens* 2 (or 3), filaments free, anthers oblong in outline. *Fruits* hardly compressed and not keeled.

Distribution — With a single species, ranging from Sri Lanka to S China and Malesia; in *Malesia*: Java, Borneo.

Note — The lack of clear differentiation into bathyphylls and acrophylls, the arrangement of the leaves in spirals, the presence of subnodal waxy glands, the abundant, stiff, and long internal bristles, put this species in an isolated position within the subgenus. The features listed, are shared with members of subg. *Ficus* subsect. *Eriosycea*, like *F. glandulifera*, rather than with (other) members of subg. *Synoecia*. Due to the habit, including the presence of adventitious roots on stem and branches, *F. laevis* is to be regarded as a member of subg. *Synoecia*. That position is confirmed by the pollinators, belonging to the genus *Wiebesia* (Wiebes, Verh. Kon. Ned. Akad. Wet., afd. Natk. 2de reeks 92 (1994) 110).

29. Ficus laevis Blume

Ficus laevis Blume, Bijdr. (1825) 437; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278, 293; King, Sp. Ficus 2 (1888) 128, t. 161; Fl. Brit. India 5 (1888) 526; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 243; Renner, Bot. Jahrb. Syst. 39 (1907) 401; Koord., Atlas Baumart. Java 4 (1918) t. 771; Ridl., Fl. Malay Penins. 3 (1924) 344; Gagnep., Fl. Indo-Chine 5 (1928) 796; Backer & Bakh.f., Fl. Java 2 (1965) 21, 29; Corner, Gard. Bull. Singapore 21 (1965) 53; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 148, t. 22; Kochummen, Tree Fl. Malaya 3 (1978) 149; Tree Fl. Sabah & Sarawak 3 (2000) 247. — *Pogonotrophe laevis* (Blume) Miq. in Zoll., Syst. Verz. 2 (1854) 93, 99.

Ficus vagans Roxb., Fl. Ind., ed. Carey 3 (1832) 537; Wight, Ic. 2 (1843) t. 655; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278, 293. — *Pogonotrophe vagans* (Roxb.) Miq., London J. Bot. 7 (1848) 73.

Pogonotrophe assamica Miq., London J. Bot. 7 (1848) 73. — *Ficus laevis* Blume var. *assamica* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293.

Pogonotrophe emodi Wall. ex Miq., London J. Bot. 7 (1848) 73. — *Ficus emodi* (Wall. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278, 293.

Pogonotrophe laevis (Blume) Miq. var. *cordata* Miq. in Zoll., Syst. Verz. 2 (1854) 93, 99.

Pogonotrophe laevis (Blume) Miq. var. *oblongata* Miq. in Zoll., Syst. Verz. 2 (1854) 93, 99.

Pogonotrophe wightiana Miq., London J. Bot. 7 (1848) 74.

Pogonotrophe dasyphylla Miq., London J. Bot. 7 (1848) 74. — *Ficus laevis* Blume var. *dasyphylla* (Miq.) King, Sp. Ficus 2 (1888) 128; Fl. Brit. India 5 (1888) 526; Trimen, Fl. Ceyl. 4 (1898) 95.

Pogonotrophe ceylanica Miq., London J. Bot. 7 (1848) 75. — *Ficus ceylanica* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293; Trimen, Cat. Pl. Ceyl. (1885) 84, '*zeylanica*'.

Ficus subpedunculata Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293, non Miq. pp. 217, 286.

Ficus laevis Blume var. *tomentosa* King, Sp. Ficus 2 (1888) 128; Ridl., Fl. Malay Penins. 3 (1924) 344.

Ficus jamini H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8 (1910) 550; H. Lév., Fl. Kouy-Tchéou (1914/15) 430; Rehder, J. Arnold Arbor. 10 (1929) 129; 17 (1936) 75.

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), 8–20(–25) by 5–15(–20) cm, symmetric, 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 beneath; lateral veins 4–6 pairs, the basal pair up to c. 1/2 the length of the lamina, branched, tertiary venation scalariform, the smaller veins (almost) flat 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, 1.2–1.8 cm diam. when dry, 2–3.5 cm diam. when fresh, non-stipitate or up to 0.3 cm long stipitate, sparsely (but near the ostiole densely) brownish puberulous, green (?) at maturity, apex ± convex, ostiole 2–2.5 mm diam.; internal hairs abundant, long and stiff. *Tepals* red. *Stamens* 2 (or 3). *Fruits* slightly compressed.

Distribution — Continental Asia (Sri Lanka, India, Myanmar, S China, Indochina, Thailand) to Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo.

Habitat — Forest, at altitudes up to 1500 m.

Notes — 1. This species resembles *F. apiocarpa* in the position of the leaves, the length of the petiole, and often also in the shape and venation of the lamina. Moreover, the lower surface of the lamina of *F. laevis* can be faintly tessellate, but in contrast to *F. apiocarpa*, it is (by cystoliths) whitish and (by pluricellular trichomes) brownish minutely punctate, and the stomatal areas are usually surrounded by darker coloured tissue (veins). *Ficus apiocarpa* can be more easily distinguished by the absence of subnodal glands and the usually glabrous lower surface of the lamina.

2. In India, the species is represented by a cauliflorous form with larger figs, var. *macrocarpa* (Miq.) Corner (Gard. Bull. Singapore 18 (1960) 7).

Section Rhizocladus subsection Punctulifoliae

Ficus L. subg. *Synoecia* (Miq.) Miq. sect. *Rhizocladus* Endl. subsect. *Punctulifoliae* Sata (as *Punctuliifoliae*).— *Ficus* L. subg. *Eumetamorphe* Sata sect. *Eusyce* (Miq.) Benth. & Hook.f. subsect. *Punctulifoliae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 329, 384 (as *Punctuliifoliae*).

Ficus L. sect. *Trematosycea* Miq., London J. Bot. 7 (1848) 451; Fl. Ind. Bat. 1, 2 (1859) 317. — *Ficus* L. subg. *Trematosycea* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293.

Ficus L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Ramentaceae* Corner, Gard. Bull. Singapore 18 (1960) 4. — *Ficus* L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Ramentaceae* Corner subser. *Ramentaceae* Corner, Gard. Bull. Singapore 18 (1960) 4.

Ficus L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Ramentaceae* Corner subser. *Araneosae* Corner, Gard. Bull. Singapore 18 (1960) 4.
Ficus L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Ramentaceae* Corner subser. *Balanotae* Corner, Gard. Bull. Singapore 18 (1960) 4.
Ficus L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Ramentaceae* Corner subser. *Excavatae* Corner, Gard. Bull. Singapore 18 (1960) 4.
Ficus L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Ramentaceae* Corner subser. *Irritantes* Corner, Gard. Bull. Singapore 18 (1960) 4.
Ficus L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Ramentaceae* Corner subser. *Pantonianeae* Corner, Gard. Bull. Singapore 18 (1960) 4.

Indumentum usually partly or largely consisting of stiff (to setose) hairs with ± swollen bases. *Leafy twigs* eglandular. *Lamina* symmetric, mostly ± densely hairy beneath, areoles not marked, or if marked, then foveolate with small stomatal pits or minutely bullate; petiole mostly short. *Figs* axillary and mostly also below the leaves (ramiflorous, or possibly sometimes cauliflorous), on short spurs already developing in the leaf axils, on the spurs the figs often clustered, already in the leaf axils or mainly below the leaves; receptacle small to rather large, often stipitate, basal bracts often caducous, ostiole often sunken. *Staminate* and *neuter flowers* near the ostiole. *Stamens* 2, with the lower parts of the filaments connate; anthers lanceolate to oblong in outline.

Distribution — This subsection comprises 25 species, all occurring in the Malesian region; some species with extensions to the Asian mainland, others with extensions to Australia and/or the Solomon Islands.

Morphology — In *F. insculpta*, *F. jacobsii*, and *F. odoardii* the hairs, in particular those on the fig receptacle, become more or less easily detached from the swollen bases and are irritant.

Subdivision — Within this subsection two major sets of species can be recognized:

a. *Ficus baeuerlenii*-group — *Tertiary venation* scalariform to reticulate. *Figs* axillary (or just below the leaves or in *F. odoardii* also rami- to cauliflorous), in pairs or solitary; basal bracts mostly caducous; ostiole mostly sunken.
Distribution — Comprising 13 species; centred in the eastern Malesian region; 10 species in New Guinea, two of them extending to the Moluccas, one extending to the Solomon Islands. This group comprises: *F. ampulliformis*, *F. baeuerlenii*, *F. colobocarpa*, *F. devestiens*, *F. floccifera*, *F. fuscata*, *F. hypobrunnea*, *F. insculpta*, *F. jacobsii*, *F. odoardii*, *F. ovatacuta*, *F. oxymitroides*, and *F. sageretina*.
Note — *Ficus odoardii* would fit in the *F. villosa*-group because of the position of the figs, but the presence of irritating hairs and the tuft of hairs around the ostiole are indications that it is closest to some members of the *F. baeuerlenii*-group.

b. *Ficus villosa*-group — *Tertiary venation* scalariform (but in *F. pantoniana* reticulate to subscalariform). *Figs* axillary or below the leaves (ramiflorous, or sometimes to cauliflorous?), on spurs which already develop in the leaf axils, in pairs or solitary, or often also clustered, often already in the leaf axils), with persistent or caducous basal bracts, the ostiole slightly sunken, flat or prominent.
Distribution — Comprising 13 species; centred in the western Malesian region, all lowland species; *F. sagittata* extends to the Asian mainland; *F. camptandra* is confined to New Guinea and the Moluccas; and *F. pantoniana* ranges from the Moluccas to New Britain and Australia (Queensland).

Notes — 1. The figs are often clustered, mostly already in the leaf axils if the figs are small, but if they are relatively large, then even on spurs usually not more than 2 occur simultaneously.

2. This group can be divided into two main subgroups:
   a. *Ficus villosa*-subgroup — *Lamina* not foveolate beneath; cystoliths on both surfaces. *Ostiole* mostly slightly sunken. This subgroup comprises: *F. camptandra*, *F. odoardii*, *F. pantoniana*, *F. pendens*, *F. recurva*, *F. sabahana*, *F. sagittata*, *F. spiralis*, and *F. villosa*.
   b. *Ficus excavata*-subgroup — *Lamina* (sub)foveolate beneath; cystoliths only beneath or above. *Ostiole* mostly slightly prominent to flat. This subgroup comprises: *F. araneosa*, *F. excavata*, *F. lanata*, and *F. supperforata*.
   Note — The lower surface may vary from clearly foveolate to hardly so in both *F. araneosa* and *F. lanata*. In these two species the areoles are minutely bullate, like in *F. villosa*.

30. Ficus ampulliformis Corner

Ficus ampulliformis Corner, Gard. Bull. Singapore 19 (1962) 387, 388, t. 2; 21 (1965) 54.

Root-climber. *Branchlets* drying dark brown, with numerous minute lenticels. *Leafy twigs* c. 2 mm thick, compressed, whitish puberulous. *Leaves* distichous; lamina elliptic to oblong, 2.5–5 by 1.5–3 cm, symmetric, coriaceous, apex subacute, base equilateral, cuneate to obtuse, margin entire, revolute; upper surface (sub)hispidulous, mainly on the veins, ± scabrous, lower surface whitish subtomentose to puberulous on the veins; cystoliths on both sides; midrib flat to slightly impressed above, lateral veins 4 or 5 pairs, the basal pair up to c. 1/3–1/2 the length of the lamina, (faintly) branched, tertiary venation reticulate, the smaller veins slightly prominent and the areoles bullate beneath; waxy glands in the axils of the basal lateral veins; petiole 0.4–0.8 cm long, whitish puberulous, the epidermis flaking off; stipules 0.4–1 cm long, brownish (sub)sericeous, caducous. *Figs* axillary, solitary or in pairs; peduncle 0.3–0.5 cm long; basal bracts early caducous, length not known; receptacle subglobose, 0.6–0.7 cm diam. when dry, glabrous or brownish tomentose, green (?) at maturity, 0.05–0.15 cm long stipitate, apex ± umbonate, ostiole c. 0.5 mm diam., sunken; internal hairs few and minute or absent. *Tepals* red.

Distribution — New Guinea (western).

Habitat — Forest on stony, sandy soil, at an of altitude about 730 m (type collection).

Note — This species is distinct in the ± scabrous upper surface of the (small) lamina.

31. Ficus araneosa King

Ficus araneosa King, Sp. Ficus 2 (1888) 136, t. 170; Fl. Brit. India 5 (1888) 529; Ridl., Fl. Malay Penins. 3 (1924) 345; Corner, Gard. Bull. Singapore 19 (1962) 391, t. 4; 21 (1965) 57; Kochummen, Tree Fl. Malaya 3 (1978) 140.

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 sub-

ovate to oblong, 3–11 by 1.2–4.5 cm, symmetric, 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 up to c. 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 (up to 7) clustered, also on up to 0.3 cm long spurs on the older wood, 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.

Distribution — Malay Peninsula and Sumatra.

Habitat — Forest, at low altitudes.

Note — This species is distinct by the dense pale-coloured floccose indumentum on the various plant parts, including the fig receptacle.

32. **Ficus baeuerlenii** King

Ficus baeuerlenii King, J. Asiat. Soc. Bengal 55, 2 (1887) 408; Sp. Ficus 2 (1888) App. 8, t. 231B; Diels, Bot. Jahrb. Syst. 67 (1935) 224; Summerh., J. Arnold Arbor. 22 (1941) 103; Corner, Gard. Bull. Singapore 21 (1965) 55.

Ficus mespiloides King, Sp. Ficus 2 (1888) 83, t. 105; Diels, Bot. Jahrb. Syst. 67 (1935) 201.

Ficus hollrungii Lauterb. & K. Schum., Fl. Schutzgeb. Südsee (1901) 287.

Ficus baeuerlenii King var. *glabrata* Diels, Bot. Jahrb. Syst. 67 (1935) 224; Corner, Gard. Bull. Singapore 21 (1965) 55.

Ficus laurentina Diels, Bot. Jahrb. Syst. 67 (1935) 224.

Ficus balanota Diels, Bot. Jahrb. Syst. 67 (1935) 227; Corner, Gard. Bull. Singapore 19 (1962) 391, t. 4; 21 (1965) 54.

Ficus baeuerlenii King var. *vulcaniformis* Corner, Gard. Bull. Singapore 18 (1960) 11; 19 (1962) 388, t. 2.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–4 mm thick, pale brown strigillose to hirtellous to subtomentose or to (sub)villous. *Leaves* distichous; lamina oblong to subovate, (6–)10–20(–25) by (2.5–)5–11 cm, symmetric, (sub)coriaceous, apex acuminate, base (almost) equilateral, rounded to cordate (or to obtuse), margin entire, flat or ± revolute; upper surface puberulous to strigillose, mainly on the veins, glabrescent, sometimes ± bullate, lower surface brown (sub)strigillose to hirtellous to subtomentose on the main veins to puberulous on the smaller veins; cystoliths on both sides; main veins ± impressed (and the midrib raised as a narrow ridge in the impression) to flat above, lateral veins 5–9 pairs, the basal pair up to 1/3–1/2(–2/3) the length of the lamina, branched, tertiary venation scalariform, the smaller veins ± prominent to almost flat beneath; waxy glands in the axils of the basal lateral veins and also of some other lateral veins; petiole (0.5–)1–2 cm long, brown strigillose to hirtellous to sub-

Fig. 96. *Ficus baeuerlenii* King. Leafy twigs and figs, Papua New Guinea. Photo R.D. Hoogland.

tomentose or to subvillous, the epidermis flaking off; stipules (0.5–)1–1.5 cm long, brown subvillous to subsericeous to subtomentose or to hirtellous, caducous. *Figs* axillary (or just below the leaves), solitary or in pairs; peduncle 0.2–0.8 cm long; basal bracts 3–4 mm long, caducous; receptacle subglobose, (0.5–)1–2.5 cm diam. when dry, (1–)1.5–3 cm diam. when fresh, 0.3–0.8 cm long stipitate, pale brown velutinous or densely to sparsely puberulous to subtomentose, red(dish) at maturity, apex ± umbonate to protracted, convex (or mammillate), ostiole c. 1 mm diam., ± deeply sunken; wall thick; internal hairs few and small, absent or abundant. *Tepals* red. — **Fig. 94a–g, 96, 97.**

Distribution — New Guinea; extending to the Solomon Islands.

Habitat — Forest, at low altitudes.

Notes — 1. In the present concept of the species, *F. balanota* is included, as the only distinctive feature of the single (= type) collection, is the small receptacle (0.5–0.8 cm diam.), of which the conical upper part is clearly distinct from the ± transversely

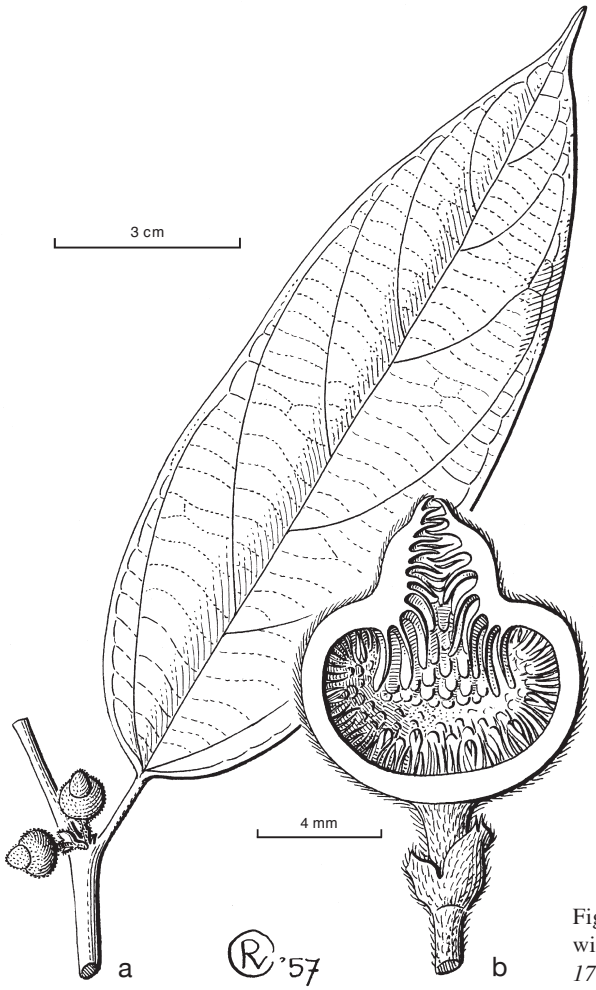

Fig. 97. *Ficus baeuerlenii* King. a. Twig with leaf and figs; b. fig (all: *Schlechter 17001*).

ellipsoid lower part. But this construction can be readily related to the protracted (vulcaniform) apex of the receptacle, common in this species.

2. This species is quite variable in the indumentum and the dimensions of the lamina and the fig receptacle.

33. Ficus camptandra Diels

Ficus camptandra Diels, Bot. Jahrb. Syst. 67 (1935) 228; Corner, Gard. Bull. Singapore 19 (1962) 388, t. 2; 21 (1965) 55.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 3–6 mm thick, ribbed, sparsely brown subhirsute to subvillous, the hairs with ± swollen bases, or also puberulous. *Leaves* distichous; lamina ovate to subovate to subcordiform or to oblong or elliptic, 8–20(–27) by 4–10(–15) cm, symmetric, coriaceous, apex acuminate subacute, base

Fig. 98. *Ficus camptandra* Diels. a. Leafy twig with figs on the older wood; b. fig; c. long-styled flowers; d. fruits (all: *Buwalda 4993*).

(almost) equilateral, cordate (to rounded), margin entire, flat or slightly revolute; upper surface sparsely hirtellous, glabrescent, often ± bullate, lower surface sparsely puberulous or also very sparsely strigose on the main veins, the hairs with swollen bases, or also puberulous; cystoliths on both sides; midrib prominent to almost flat above, main veins flat or slightly impressed and then the midrib raised as a narrow ridge in the impression above, also other veins often ± impressed, lateral veins 6–9 pairs, the basal pair

up to 1/4–1/3(–1/2) the length of the lamina, branched, tertiary venation scalariform, the smaller veins slightly prominent to almost flat beneath; waxy glands in the axils of the basal lateral veins and also of some other lateral veins; petiole 1–2.5(–4) cm long, sparsely subhirsute to strigose, the epidermis flaking off; stipules 1–2 cm long, sparsely to densely strigose to subvillous, caducous. *Figs* axillary and ramiflorous to cauliflorous on up to 1 cm long robust spurs on the older wood (at the apex usually hairy and with subpersistent stipules), solitary or in pairs; with up to 0.3 cm long peduncle or sessile; basal bracts 3–5 mm long, caducous; receptacle subglobose, (1–)1.2–2 cm diam. when dry, 0.3–2 cm long stipitate, glabrous or sparsely whitish subtomentose, punctate-muriculate (at least at the apex), surface smooth or pustulate, red to purplish at maturity, apex convex, ostiole 1–1.5 mm diam., slightly sunken, surrounded by a low rim; internal hairs absent or few and small. *Tepals* red. — **Fig. 98.**

Distribution — Moluccas (Aru Islands) and New Guinea.

Habitat — Forest, at low altitudes.

Note — The species resembles *F. sagittata*, from which it differs, e.g., in the well-developed spurs on the older wood and the presence of long hairs on the leafy twigs and petioles. It, moreover, resembles *F. pantoniana*.

34. Ficus colobocarpa (Corner) C.C. Berg

Ficus colobocarpa (Corner) C.C. Berg, Blumea 48 (2003) 556. — *Ficus pantoniana* King var. *colobocarpa* Diels ex Corner, Gard. Bull. Singapore 18 (1960) 8; 19 (1962) 388, t. 2; 21 (1965) 53.

Root-climber. *Branchlets* drying dark brown. *Leafy twigs* 2–3 mm thick, brown (sub)strigillose. *Leaves* distichous; lamina oblong, 4–12 by 1.5–4 cm, symmetric, coriaceous, apex (sub)acuminate, base equilateral, rounded to subcordate, margin entire; upper surface brown strigillose or glabrous, lower surface (sub)strigillose to subsericeous on the main veins, hairs on the smaller veins pointing towards the apex of the lamina; cystoliths on both sides; midrib prominent above, raised as a narrow ridge in an impression, lateral veins 4 or 5 pairs, the basal pair up to c. 1/3 the length of the lamina, faintly branched, tertiary venation (sub)scalariform, the smaller veins prominent beneath; waxy glands in the axils of the basal lateral veins; petiole 0.5–1 cm long, brown (sub)strigillose, the epidermis persistent; stipules c. 0.5 cm long, brownish (sub)sericeous, caducous. *Figs* axillary (?), solitary or in pairs (?), sessile; basal bracts c. 1–3 mm long, caducous (or subpersistent?); receptacle ellipsoid, 0.8–1 cm diam. when dry, 0.4–0.5 cm long stipitate, the stipes yellowish (sub)sericeous, colour at maturity unknown, apex ± convex or flat, ostiole 0.5–1 mm diam., sunken or prominent, surrounded by a low rim; wall rather thick; internal hairs absent. *Tepals* red.

Distribution — New Guinea.

Ecology — Forest, at altitudes of 600–700 m.

Notes — 1. This species shows similarities to *F. ovatacuta* and *F. sageretina*. It differs from both in the persistent epidermis of the petiole, the abundant presence of hairs also on the smaller veins of the lamina beneath, and the ellipsoid fig receptacle, being hairy only on the stipe.

2. As all figs of the only collection known of the species are detached, their position on the plant is uncertain.

35. Ficus devestiens Corner

Ficus devestiens Corner, Gard. Bull. Singapore 18 (1960) 9; 21 (1965) 54.

Root-climber. *Branchlets* drying (dark) brown. *Leafy twigs* (1–)1.5–2.5 mm thick, brown hirtellous to subvillous, the hairs with ± swollen bases. *Leaves* distichous; lamina oblong to subovate to ovate (or to lanceolate), 4–17 by 2–6 cm, symmetric, (sub)coriaceous, apex acuminate to subacute, base equilateral, rounded to subcordate, margin entire, revolute; upper surface sparsely hirtellous, mainly on the veins, glabrescent; lower surface brown hirtellous to subvillous on the veins, the hairs with ± swollen bases; cystoliths on both sides; midrib prominent above, lateral veins 6–9 pairs, the basal pair up to c. 1/5–1/3 the length of the lamina, (faintly) branched, tertiary venation scalariform, the smaller veins (almost) flat beneath; waxy glands in the axils of the basal lateral veins and also of some of the other lateral veins; petiole (0.8–)1–1.7 cm long, brown hirtellous to subvillous, the epidermis flaking off; stipules (0.5–)1–1.8(–2) cm long, brown hirtellous to subhirsute, caducous. *Figs* axillary, in pairs or solitary, sessile; basal bracts 4–6 mm long, connate, caducous; receptacle subglobose, 0.5–0.8 cm diam. when dry, brown hirtellous, reddish at maturity, apex convex, ostiole c. 1.5 mm diam., slightly prominent, surrounded by a low rim; internal hairs absent or sparse. *Tepals* red.

Distribution — Moluccas (Bacan, Ceram, Ambon, Ternate), New Guinea (eastern).

Habitat — Forest, at low altitudes, but in New Guinea at c. 2000 m.

Notes — 1. The single collection known from eastern New Guinea (with slender twigs and petioles) largely matches the collections from the Moluccas.

2. The connate basal bracts are characteristic for this species.

3. The species shows affinities to *F. insculpta*.

36. Ficus excavata King

Ficus excavata King, Sp. Ficus 2 (1888) 127, t. 115B; Fl. Brit. India 5 (1888) 526; Renner, Bot. Jahrb. Syst. 39 (1907) 400; Merr., Enum. Born. (1921) 223; Ridl., Fl. Malay Penins. 3 (1924) 344; Corner, Gard. Bull. Singapore 19 (1962) 391, t. 4; 21 (1965) 57; Kochummen, Tree Fl. Malaya 3 (1978) 146; Tree Fl. Sabah & Sarawak 3 (2000) 240.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 1–2.5 mm thick, solid, densely brown(ish) subtomentose to subvillous. *Leaves* distichous; lamina ovate to cordiform to suborbicular to subovate or to elliptic, 1–4.5 by 0.5–3.5 cm, symmetric (or ± asymmetric), coriaceous, apex obtuse to rounded (or to acute), base equilateral to ± inequilateral, rounded to subcordate or to obtuse, margin entire, flat, ciliate; upper surface appressed-puberulous to subtomentose, mainly on the main veins or only on the midrib, glabrescent, lower surface appressed-puberulous to subtomentose or subglabrous; cystoliths only beneath; midrib flat above, lateral veins (2 or) 3 or 4 (or 5) pairs, the basal pair veins up to 1/3–1/2 the length of the lamina, unbranched, tertiary venation reticulate, the smaller veins flat beneath, the areoles small and foveolate beneath; waxy glands in the axils of the basal lateral veins and also of some other lateral veins; petiole 0.2–0.8 cm long, brownish subtomentose to subvillous, the epidermis

flaking off; stipules 0.3–0.8 cm long, (sub)glabrous, or puberulous at the apex, caducous. *Figs* axillary, in pairs or (up to 8) clustered, also on up to 0.2 cm long spurs on the older wood, sessile; basal bracts c. 1 mm long, persistent; receptacle subglobose, 0.2–0.3 cm diam. when dry, non-stipitate, glabrous, yellow to red at maturity, apex convex, ostiole 0.5–1 mm diam., slightly prominent to slightly sunken; internal hairs absent. *Tepals* red.

Distribution — Sumatra, Malay Peninsula, Borneo.

Habitat — Forest, at altitudes up to c. 1300 m.

Note — The small ovate laminas with the lower surface foveolate are distinctive.

37. **Ficus floccifera** Diels

Ficus floccifera Diels, Bot. Jahrb. Syst. 67 (1935) 231; Corner, Gard. Bull. Singapore19 (1962) 388, f. 2; 21 (1965) 54.

Root-climber. *Branchlets* drying dark brown to blackish. *Leafy twigs* 1.5–2.5 mm thick, brownish to whitish floccose-tomentose, glabrescent. *Leaves* distichous; lamina oblong, 2.5–15 by 1.2–5.5 cm, symmetric, coriaceous, apex (sub)acuminate, base equilateral, subcordate to obtuse, margin entire; upper surface glabrous, lower surface whitish to brown floccose-tomentose on the main veins, glabrescent; cystoliths on both sides; midrib (slightly) prominent above, lateral veins (5–)6–9 pairs, the basal pair up to c. 1/5–1/3 the length of the lamina, unbranched, tertiary venation reticulate to subscalariform, the smaller veins (almost) flat beneath; waxy glands in the axils of the basal lateral veins and also of some of the other lateral veins; petiole 0.6–1.2 cm long, brownish floccose-tomentose, the epidermis flaking off; stipules 0.3–0.6 cm long, brown floccose-tomentose, caducous. *Figs* axillary (or also on up to c. 0.5 cm long spurs below the leaves?) in pairs or solitary; sessile or up to 0.5 cm long pedunculate; basal bracts c. 2 mm long, caducous; receptacle subglobose, 0.7–1 cm diam. when dry, pale brown floccose-tomentose, glabrescent, (faintly) ribbed, crimson at maturity, 0.1–0.4 cm long stipitate, apex ± umbonate, ostiole c. 0.5 mm diam., ± sunken; internal hairs absent. *Tepals* red.

Distribution — New Guinea.

Habitat — Forest, at altitudes up to c. 1300 m.

Notes — 1. This species shows affinities to *F. oxymitroides*, from which it differs in the short stipules, the presence of floccose indumentum (although often disappearing soon) on the various plant parts, and the largely reticulate tertiary venation.

2. In the material examined, the figs are not attached to the spurs.

38. **Ficus fuscata** Summerh.

Ficus fuscata Summerh., J. Arnold Arbor. 22 (1941) 103; Corner, Gard. Bull. Singapore 21 (1965) 59.

Root-climber. *Branchlets* drying brown to blackish; scars of the petioles ± prominent. *Leafy twigs* 2–4 mm thick, solid minutely white puberulous and brownish (sub)hirsute. *Leaves* distichous; lamina (sub)ovate, 6–16 by 3.5–9.5 cm, symmetric, (sub)coriaceous, apex subacuminate to acute, base equilateral, rounded to subcordate, margin entire, flat;

upper surface sparsely puberulous to hirtellous on the main veins, lower surface minutely puberulous to tomentellous and brownish strigose to (sub)hirtellous on the main veins, the longer hairs mostly with ± swollen bases, brownish to whitish tomentose on the smaller veins; cystoliths only beneath; midrib almost flat above, lateral veins 5 or 6 pairs, the basal pair up to c. 1/2 the length of the lamina, branched, the other lateral veins often branched or furcate far from the margin, tertiary venation scalariform, the smaller veins slightly prominent beneath; waxy glands in the axils of the basal lateral veins and also in the axils of other lateral veins; petiole (1–)2–3.5 cm long, brownish hirtellous, the epidermis flaking off; stipules 0.5–0.8 cm long, brown hirsute to subsericeous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.3–0.6 cm long; basal bracts c. 5 mm long, basally connate, densely minutely white puberulous and with sparse much longer brown hairs, caducous; receptacle subglobose, 1.3–1.5 cm diam. when dry, c. 2 cm diam. when fresh, non-stipitate, densely whitish (sub)-tomentose, glabrescent (?), dark purple at maturity, apex convex, ostiole 2–2.5 mm diam., ± slightly sunken, surrounded by a tuft of hairs; internal hairs sparse. *Tepals* reddish.

Distribution — New Guinea (eastern).

Habitat — Forest, at altitudes of c. 500 m.

Note — This species (only known from the type collection) shares the tuft of hairs around the ostiole with *F. odoardii* and *F. insculpta*. It differs from both in the longer petioles and shorter stipules, from the former also in the absence of irritant hairs, and from the latter also in pedunculate figs with larger receptacles.

39. Ficus hypobrunnea Corner

Ficus hypobrunnea Corner, Gard. Bull. Singapore 19 (1962) 387, 388, t. 2; 21 (1965) 54.

Root-climber. *Branchlets* drying dark brown. *Leafy twigs* 1.5–2 mm thick, densely brown strigillose. *Leaves* distichous; lamina oblong to subovate, 2.5–5.5 by 1.2–2.5 cm, symmetric, coriaceous, apex subacute, base equilateral, rounded to subcuneate, margin entire, revolute; upper surface glabrous, lower surface brown (sub)strigillose, also on the smaller veins; cystoliths on both sides; midrib slightly impressed above, lateral veins 4 or 5 pairs, the basal pair up to c. 1/3–1/2 the length of the lamina, faintly branched, tertiary venation reticulate, the smaller veins (almost) flat beneath; waxy glands in the axils of the basal lateral veins and also of some of the other lateral veins; petiole 0.3–0.7 cm long, brown strigillose, the epidermis persistent; stipules 0.4–0.8 cm long, brownish (sub)sericeous, caducous. *Figs* axillary, solitary; peduncle c. 0.1 cm long; basal bracts 1–1.5 mm long, caducous; receptacle subglobose, 0.6–0.8 cm diam. when dry, densely brown substrigillose, red at maturity, 0.1–0.15 cm long stipitate, apex ± umbonate, ostiole c. 0.5 mm diam., sunken; internal hairs abundant. *Tepals* red.

Distribution — New Guinea (western).

Habitat — Forest on sandy clay, at the altitude of 50 m (type collection).

Note — This species resembles *F. sageretina*, from which it can be distinguished by the reticulate tertiary venation, the presence of waxy glandular spots in the axils of more lateral veins than only the basal ones, and the persistent epidermis of the petiole.

40. **Ficus insculpta** Summerh.

Ficus insculpta Summerh., J. Arnold Arbor. 22 (1941) 105; Corner, Gard. Bull. Singapore 21 (1965) 54.
Ficus ceanothifolia Corner, Gard. Bull. Singapore 18 (1960) 9; 21 (1965) 54.
Ficus convexa Corner, Gard. Bull. Singapore 19 (1962) 389, 390, t. 3; 21 (1965) 55.

Root-climber. *Branchlets* drying dark brown to blackish. *Leafy twigs* 1.5–3 mm thick, brown hirtellous to subhirsute to subvillous or to subtomentose, all or most (thicker) hairs with ± swollen bases. *Leaves* distichous; lamina ovate to subovate to elliptic to oblong, (1–)5–15 by (0.7–)2–6.5 cm, symmetric, coriaceous, apex acuminate to subacute, base equilateral, subcordate to rounded, margin entire, revolute; upper surface sparsely hirtellous to strigillose, glabrescent, mostly ± bullate, lower surface brown hirtellous to substrigillose or to subvillous on the veins, all or most (thicker) hairs with ± swollen bases; cystoliths on both sides; venation ± impressed above, the midrib raised as a narrow ridge in the impression, lateral veins (3–)5–8 pairs, the basal pair up to 1/4–1/2 the length of the lamina, (faintly) branched, tertiary venation scalariform, the smaller veins ± prominent to almost flat beneath; waxy glands in the axils of the basal lateral veins and also of some of the other lateral veins; petiole (0.2–)0.5–1.5 cm long, brown hirtellous to subvillous or to subtomentose, the epidermis flaking off; stipules (0.5–)1–1.5(–2) cm long, brown hirtellous to subhirsute, caducous. *Figs* axillary, in pairs or solitary (or in clusters of 3 or 4), (sub)sessile; basal bracts 3–7 mm long, distinctly unequal in size, caducous; receptacle subglobose, (0.3–)0.6–1 cm diam. when dry, sparsely to densely brown hirtellous to strigillose (to whitish puberulous), the stiff hairs with swollen bases, (or glabrous), orange to red at maturity, apex convex, ostiole 0.5–1 mm diam., sunken, often surrounded by a tuft of hairs; internal hairs absent or sparse and small. *Tepals* red. — **Fig. 93c.**

Distribution — New Guinea.

Habitat — Montane forest, at altitudes between 850 and 2600 m.

Notes — 1. In the present treatment, *F. convexa* and *F. ceanothifolia* are included in *F. insculpta*. *Ficus ceanothifolia* was established to accommodate material with small leaves (1–2.5 cm long with 3–5 pairs of lateral veins) and small figs (0.3–0.5 cm diam.), features apparently caused by environmental conditions.

2. The stiff hairs, especially those on the receptacle, break off easily and are irritant.

41. **Ficus jacobsii** C.C. Berg

Ficus jacobsii C.C. Berg, Blumea 48 (2003) 559.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, solid, sparsely minutely puberulous to subhispidulous and sparsely setose-strigose (with irritant hairs). *Leaves* distichous; lamina ovate to subovate, 9–17 by 4–9 cm, symmetric, coriaceous, apex acuminate or apiculate, base equilateral, cordate, margin entire, flat or revolute towards the base; upper surface glabrous, lower surface sparsely setose-strigose (with irritant hairs) or also sparsely hispidulous on the main veins; cystoliths on both surfaces; midrib slightly prominent above, lateral veins 6–8 pairs, the basal

pair up to c. 1/4–1/3 the length of the lamina, branched, tertiary venation scalariform, the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins and of some other lateral veins or also in the axils of branches of lateral veins; petiole 1–1.8 cm long, glabrous, the epidermis flaking off; stipules 0.8–1 cm long, minutely brown puberulous and sparsely setose-strigose (with irritant hairs), mainly at the base, caducous. *Figs* axillary or just below the leaves (?), solitary; peduncle c. 0.5 cm long; basal bracts 2–5 mm long, caducous; receptacle subglobose, 1.5–5 (or –6.5?) cm diam. when dry, up to 6.5 cm diam. when fresh, 1–1.2 cm long stipitate, setose, ± orange at maturity, wall (3–12 mm) thick and hard, apex convex, ostiole 2–5 mm diam., slightly to deeply sunken; internal hairs very sparse. *Tepals* red.

Distribution — New Guinea (eastern).

Habitat — Montane and submontane forest; altitudes between c. 1000 and 2200 m.

Notes — 1. This species resembles *F. baeuerlenii* and *F. odoardii* in the shape and dimensions of the leaves and the figs. It is distinct in the rather sparse indumentum, mainly consisting of setose and irritant hairs.

2. In the two collections examined, the dimensions of 'gall-figs' differ considerably, 1.5–2 cm or 4.5–6.5 cm diameter.

42. **Ficus lanata** Blume

Ficus lanata Blume, Bijdr. (1825) 441; Miq., Fl. Ind. Bat. 1, 2 (1859) 317; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; King, Sp. Ficus 2 (1888) 137, t. 171; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 234; Renner, Bot. Jahrb. Syst. 39 (1907) 401; Koord., Exk. Fl. Java 4 (1924) t. 777; Corner, Gard. Bull. Singapore 19 (1962) 391, t. 4; Backer & Bakh.f., Fl. Java 2 (1965) 23; Corner, Gard. Bull. Singapore 21 (1965) 57; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 251.

Ficus lanata Blume var. *foveolata* Corner, Gard. Bull. Singapore 18 (1960) 16.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–5 mm thick, mostly hollow, densely pale brown to yellowish hirtellous to villous to lanate. *Leaves* distichous; lamina subovate to ovate, 4–11 by 1.5–5 cm, symmetric, coriaceous, apex (sub)acuminate, base (almost) equilateral, rounded to cordate (or to obtuse), margin entire, ± revolute; upper surface brownish strigillose to pubescent, mainly in the main veins, glabrescent, lower surface densely hirtellous to strigillose or to subtomentose on the veins, the longer hairs with ± swollen bases; cystoliths only beneath; midrib impressed, at least the lower part, other main veins often slightly impressed above, lateral veins 4–6(–7) pairs, the basal pair up to 1/3–1/2 the length of the lamina, often close to the margin, (faintly) branched, tertiary venation scalariform, the smaller veins prominent beneath, the areoles small, minutely bullate and/or faintly to clearly foveolate beneath; waxy glands in the axils of the basal lateral veins and also of some other lateral veins and in the axils of branches of the basal lateral veins; petiole 1–3 cm long, densely brown hirtellous, the epidermis persistent; stipules (0.5–)1–2(–2.5) cm long, sparsely minutely whitish appressed-puberulous and or only brown substrigillose to hirtellous on the keel, caducous (or subpersistent). *Figs* axillary, in pairs or (up to 8) clustered, also on up to 0.5 cm long spurs on the older wood, sessile or with a peduncle up to 0.1 cm long; basal bracts 1.5–2 mm long, caducous; receptacle subglobose, 0.4–0.6 cm diam. when dry, 1–1.5 cm diam. when fresh, 0.3–0.7 cm long stipitate, densely to sparsely

brownish to whitish puberulous or subglabrous, red at maturity, apex convex, ostiole 0.5–1 mm diam., flat to slightly prominent; internal hairs abundant. *Tepals* red.

Distribution — Sumatra, Java, Borneo.

Habitat — Forest, at altitudes up to 1700 m.

Notes — 1. The species shows strong affinities to *F. villosa*, from which it mostly differs in the smaller number of lateral veins, the development of a foveolate lower surface of the lamina (mainly in Borneo), and the appressed to patent, rarely tending to retrorse hairs on the main veins of the lamina beneath. However, in the Philippines, in the material referred to *F. villosa,* the number of lateral veins is often up to 6 pairs, and this material can only be distinguished by the common occurrence of retrorse hairs on the main veins beneath. It is, therefore, somewhat doubtful whether *F. lanata* merits the rank of species. The distribution of the cystoliths might be a consistent differentiating character.

2. In the material from Borneo, recognized as var. *foveolata* by Corner, the lamina is ± clearly foveolate and the fig receptacles subglabrous. In the material from Sumatra and Java the lamina is often hardly or not foveolate (but minutely bullate) and the fig receptacles are often densely hairy.

43. Ficus odoardii King

Ficus odoardii King, J. Asiat. Soc. Bengal 55, 2 (1887) 409; Sp. Ficus 2 (1888) 156, t. 198; K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1901) 287; Summerh., J. Arnold Arbor. 10 (1929) 150; Diels, Bot. Jahrb. Syst. 67 (1935) 227; Corner, Gard. Bull. Singapore 21 (1965) 54.

Ficus conspicabilis King, Sp. Ficus 2 (1888) 80, t. 99; Diels, Bot. Jahrb. Syst. 67 (1935) 227.

Ficus trichosphaeridia Diels, Bot. Jahrb. Syst. 67 (1935) 225; Summerh., J. Arnold Arbor. 22 (1941) 104.

Ficus cinnabarina S. Moore, J. Bot. 61, Suppl. (1923) 50; Diels, Bot. Jahrb. Syst. 67 (1935) 224; Summerh., J. Arnold Arbor. 22 (1941) 102.

Ficus irritans Summerh., J. Arnold Arbor. 22 (1941) 104; Corner, Gard. Bull. Singapore 21 (1965) 54.

Ficus odoardii King var. *glabrata* Corner, Gard. Bull. Singapore 18 (1960) 10.

Ficus sphaerocarpa Corner, Gard. Bull. Singapore 18 (1960) 11; 19 (1962) 390, t. 3; 21 (1965) 54.

Root-climber. *Branchlets* drying dark brown to blackish. *Leafy twigs* 2–4 mm thick, brown hirtellous to subvillous, the thicker hairs with ± swollen bases. *Leaves* distichous; lamina subovate to elliptic to oblong, (5–)10–20(–25) by (2.5–)5–10(–14) cm, symmetric, coriaceous, apex (sub)acuminate, base (almost) equilateral, cordate to rounded, margin entire, flat or ± revolute; upper surface puberulous to strigillose, mainly on the veins, glabrescent, lower surface brown hirtellous to strigillose or partly puberulous or subtomentose, the thicker hairs with ± swollen bases; cystoliths on both sides; midrib slightly prominent to flat to slightly impressed above, other veins mostly flat, sometimes slightly impressed, lateral veins 5–9 pairs, the basal pair up to 1/3–1/2 the length of the lamina, branched, tertiary venation scalariform, the smaller veins ± prominent to almost flat beneath; waxy glands in the axils of the basal lateral veins and also of some other lateral veins; petiole (0.5–)1–2(–2.5) cm long, brown hirtellous to subvillous, the epidermis flaking off; stipules 0.5–1.5 cm long, brown hirtellous to subvillous, caducous. *Figs* axillary, solitary or paired, or on up to 2 cm long spurs on the older wood, and then sometimes up to 13 clustered; with a peduncle up to 1 cm long or sessile;

basal bracts 2–6 mm long, caducous; receptacle subglobose (or ovoid), (0.6–)1.5–3.5 cm diam. when dry, 2.5–4.5 cm diam. when fresh, 0.2–2.5 cm long stipitate or non-stipitate, densely to sparsely brownish hirtellous to strigillose, the hairs with swollen bases, or also partly whitish appressed-puberulous, orange to red or pink to scarlet at maturity, apex ± umbonate, ostiole c. 1 mm diam., ± deeply sunken, mostly surrounded by a tuft of hairs; wall thick; internal hairs absent, few and small or abundant. *Tepals* red. — **Fig. 93d–j.**

Distribution — Moluccas (Ceram) and New Guinea.

Habitat — Forest, at altitudes up to 2000 m.

Notes — 1. Both *F. irritans* and *F. sphaerocarpa*, recognized as distinct species by Corner (1962, 1965), are currently included in *F. odoardii*, as it was impossible to find differentiating characters in the vegetative parts. The figs, however, show considerable differences as in the dimensions of the receptacle, the length of the peduncle and the stipe, the thickness of the wall of the fig, and the presence of internal hairs.

2. The stiff hairs with swollen bases, especially those on the receptacles, break easily from the swollen base (socket) and are irritant.

3. Collection *Jacobs 9190* from eastern New Guinea is exceptional by the numerous (up to 13), small (0.6–0.7 cm diam.), ovoid, and sessile figs on spurs below the leaves.

44. Ficus ovatacuta Corner

Ficus ovatacuta Corner, Gard. Bull. Singapore 19 (1962) 391. t. 5; 21 (1965) 57.
Ficus pantoniana King var. *rhytidophloea* Corner, Gard. Bull. Singapore 18 (1960) 8.

Root-climber. *Branchlets* drying dark brown to blackish. *Leafy twigs* 1–2.5 mm thick, solid, ± densely (to rather sparsely) brown subtomentose to subvillous. *Leaves* distichous; lamina ovate to subovate (or to elliptic), 1.5–6 by 1–3.2 cm, symmetric, coriaceous, apex acuminate to obtuse (to rounded), base equilateral, rounded to subcordate (or to cuneate), margin entire, ± revolute to almost flat; upper surface (sub)glabrous, lower surface sparsely strigillose to appressed-puberulous on the main veins; cystoliths on both sides; midrib ± prominent above, lateral veins 3–6(–7) pairs, the basal pair up to 1/6–1/3(–1/2) the length of the lamina, close to the margin, unbranched, the other lateral veins often furcate far from the margin, tertiary venation reticulate, the smaller (almost) flat beneath; waxy glands in the axils of the basal lateral veins, small, or also small ones in the axils of other lateral veins; petiole 0.3–1.2 cm long, subtomentose to puberulous, the epidermis flaking off; stipules 0.3–1.2 cm long, sparsely strigillose to glabrous, caducous (or subpersistent). *Figs* axillary, solitary, subsessile; basal bracts 1.5–2 mm long, persistent; receptacle subglobose to ovoid, (0.9–)1–1.8 cm diam. when dry, 1.5–2(–4) cm diam. when fresh, up to 0.3 cm long stipitate or non-stipitate, (faintly) ribbed, glabrous, orange to dark red at maturity, apex convex to slightly umbonate, ostiole c. 1 mm diam., slightly prominent to slightly sunken, surrounded by a low rim; wall thick; internal hairs absent. *Tepals* red.

Distribution — New Guinea.

Habitat — Montane (mossy) forest, at altitudes between c. 1350 and 2250 m.

Note — This species shows affinities to *F. oxymitroides*.

45. Ficus oxymitroides Corner

Ficus oxymitroides Corner, Gard. Bull. Singapore 18 (1960) 10; 18 (1961) 87, t. 2; 21 (1965) 54.
Ficus oxymitroides Corner var. *brevipes* Corner, Gard. Bull. Singapore 18 (1961) 86, t. 2.

Root-climber. *Branchlets* drying dark brown to blackish. *Leafy twigs* 1.5–3 mm thick, brownish to whitish minutely puberulous to subhispidulous or also sparsely hirtellous to strigillose. *Leaves* distichous; lamina oblong to subovate to elliptic, 5–16 by 2–6 cm, symmetric, coriaceous, apex acuminate, base equilateral, rounded to obtuse or to subcordate; margin entire, slightly revolute towards the base; upper surface glabrous or sparsely and minutely puberulous on the midrib, lower surface sparsely appressed-puberulous to subglabrous; cystoliths on both sides; midrib prominent above, lateral veins 4–7 pairs, the basal pair up to c. 1/3–1/2 the length of the lamina, (faintly) branched, tertiary venation scalariform, the smaller veins (almost) flat beneath; waxy glands in the axils of the basal lateral veins and also of some of the other lateral veins; petiole 0.8–1.5 cm long, sparsely puberulous, the epidermis flaking off; stipules (0.5–) 1–1.8 cm long, rather densely white to brown puberulous, or also with a few long hairs at the base (and the apex), caducous. *Figs* axillary, solitary or in pairs, with a peduncle up to 0.5 cm long or subsessile; basal bracts 2–2.5 mm long, early caducous; receptacle subglobose to ovoid to ellipsoid, 0.7–1.2 cm diam. when dry, 0.1–0.7 cm long stipitate, sparsely and minutely puberulous and sparsely brown pulverulent, red at maturity, apex slightly umbonate to convex, ostiole 1.5–2.5 mm diam., ± prominent, surrounded by a low rim; internal hairs absent. *Tepals* red.

Distribution — New Guinea (eastern).

Habitat — Montane forest, at altitudes between c. 1400 and 2600 m.

Note — The species can be recognized by the relatively long, minutely hairy stipules and the sparse indumentum on the various parts. It shows affinities to *F. ovatacuta* and to *F. floccifera*. It can be distinguished from the former by the larger laminas with scalariform tertiary venation, and from the latter by the long stipules and the absence of floccose indumentum.

46. Ficus pantoniana King

Ficus pantoniana King, J. Asiat. Soc. Bengal 55, 2 (1887) 407; Sp. Ficus 2 (1888) App. 8, t. 231A; Diels, Bot. Jahrb. Syst. 67 (1935) 223; Summerh., J. Arnold Arbor. 22 (1941) 102; Corner, Gard. Bull. Singapore 19 (1962) 388, t. 2; 21 (1965) 53.
Ficus nugentii Domin, Bibl. Bot. 89 (1921) 567.
Ficus scandens Roxb. var. *australis* F.M. Bailey, Queensl. Agr. J. 1 (1897) 452; Queensl. Fl. 5 (1902) 1473; Compr. Cat. Qld. Pl. (1913) 487, t. 488.

Root-climber. *Branchlets* drying brown to greyish. *Leafy twigs* 1.5–3 mm thick, sparsely minutely whitish appressed-puberulous or glabrous. *Leaves* distichous; lamina oblong to subovate, 3–10(–16) by 1–5(–6.5) cm, symmetric, coriaceous, apex acuminate to acute to obtuse, base equilateral, rounded to subcordate or to subcuneate, margin entire; both surfaces glabrous; cystoliths on both sides; midrib flat above, lateral veins 4–7 pairs, the basal pair up to 1/5–1/2 the length of the lamina, unbranched, tertiary venation reticulate to subscalariform, the smaller veins (almost) flat beneath; waxy glands in the axils of the basal lateral veins or also smaller ones in the axils of

other lateral veins; petiole 0.5–2 cm long, glabrous, the epidermis flaking off in large flakes; stipules, 0.4–1.2 cm long, minutely whitish appressed-puberulous or glabrous, caducous. *Figs* axillary and on up to 0.5 cm long spurs on the older wood, solitary (or in pairs); peduncle 0.2–1 cm long; basal bracts 0.5–1.5 mm long, caducous; receptacle subglobose to ovoid to ellipsoid, 0.6–1 cm diam. when dry, 2–3.5 cm diam. when fresh, 0.2–1 cm long stipitate, brown pulverulent, red to scarlet to purple-black at maturity, apex ± convex, ostiole c. 1 mm diam., ± sunken, often surrounded by a rim; internal hairs few or absent. *Tepals* red.

Distribution — From Celebes to the Solomon Islands and to Australia (Queensland); in *Malesia*: Celebes (?), Moluccas (Ceram, Ternate, Moratai), New Guinea (incl. New Britain).

Habitat — Lowland forest, at altitudes up to 800 m (or up to 1500 m?).

Notes — 1. This species resembles the form of *F. sagittata* from the Moluccas, from which it can be distinguished by the broadly flat midrib of the lamina above (in *F. sagittata* narrowly prominent), the reticulate to subscalariform tertiary venation (in *F. sagittata* distinctly scalariform), and the well-developed spurs (in *F. sagittata* poorly developed).

2. The species also resembles *F. camptandra*, from which it also differs by the reticulate tertiary venation and the flat midrib above.

3. The poor and sterile collection from Celebes (Minahassa; *Koorders 19157*) probably belongs to this species.

47. **Ficus pendens** Corner

Ficus pendens Corner, Gard. Bull. Singapore 18 (1960) 15; 21 (1965) 57; Kochummen, Tree Fl. Malaya 3 (1978) 153; Tree Fl. Sabah & Sarawak 3 (2000) 253.
Ficus pendens Corner var. *appressa* Corner, Gard. Bull. Singapore 18 (1960) 16.

Root-climber. *Branchlets* drying dark brown to blackish. *Leafy twigs* 2–3 mm thick, hollow, densely brown hirtellous to velutinous (or strigillose). *Leaves* distichous; lamina subovate to lanceolate, 5–15(–20) by 1.5–5(–6.5) cm, symmetric, coriaceous, apex subacuminate, base (almost) equilateral, rounded to subcordate (or to obtuse), margin entire, flat to ± revolute; upper surface brown hirtellous (or strigillose), mainly in the main veins, glabrescent, lower surface densely hirtellous to subtomentose (or strigillose) on the veins; cystoliths on both sides; midrib slightly impressed to flat above, lateral veins (3–)5–6(–7) pairs, the basal pair up to 1/3–1/2(–2/3) the length of the lamina, close to the margin, unbranched (or faintly branched), tertiary venation scalariform to reticulate, the smaller veins ± prominent to flat beneath; waxy glands in the axils of the basal lateral veins and also of some other lateral veins; petiole 0.3–1.2 cm long, densely brown hirtellous (or strigillose), the epidermis persistent; stipules (0.3–)1–2 cm long, brown hirtellous on the keel and the base, caducous. *Figs* axillary, in pairs or (up to 12) clustered, also on minute spurs on the older wood; (sub)sessile; basal bracts 1–2 mm long, caducous; receptacle subglobose, 0.3–0.5 cm diam. when dry, non-stipitate or up to 0.1 mm long stipitate, brown subtomentose, yellow to orange at maturity, apex convex, ostiole c. 0.5 mm diam., ± sunken, surrounded by a rim; internal hairs abundant. *Tepals* red.

Distribution — Sumatra, Malay Peninsula, Java, Borneo.

Habitat — Forest, at altitudes up to 1500 m.

Notes — 1. The hairs are mostly patent, but sometimes appressed (in E Borneo; var. *appressa* Corner).

2. This species resembles *F. villosa*, from which it can be distinguished by the smaller number of lateral veins (c. 5 pairs, but in *F. villosa* 6–10 pairs), the shorter petioles (mostly up to 1 cm long, but in *F. villosa* usually longer than 1 cm), and the (sub)sessile, non-stipitate or very shortly stipitate figs, which are only in the axils of the distal leaves not clustered.

48. **Ficus recurva** Blume

Ficus recurva Blume, Bijdr. (1825) 457; Miq., Fl. Ind. Bat. 1, 2 (1859) 317; Fl. Ind. Bat., Suppl. (1861) 432; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 279, 294; King, Sp. Ficus 2 (1888) 131, t. 165A; Fl. Brit. India 5 (1888) 527; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 231; Renner, Bot. Jahrb. Syst. 39 (1907) 401; Elmer, Leafl. Philipp. Bot. 4 (1912) 1386; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 63; Koord., Exk. Fl. Java 4 (1924) t. 778; Ridl., Fl. Malay Penins. 3 (1924) 345; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1013; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 348; Backer & Bakh.f., Fl. Java 2 (1965) 23; Corner, Gard. Bull. Singapore 21 (1965) 56; Kochummen, Tree Fl. Malaya 3 (1978) 154; Tree Fl. Sabah & Sarawak 3 (2000) 238.

Root-climber. *Branchlets* drying dark brown to blackish. *Leafy twigs* 1.5–3 mm thick, solid, (rather) densely brown subvillous to strigillose and/or sparsely to densely puberulous with all or most hairs uncinate (and often ± retrorse) and then often only strigillose on or near the nodes, or minutely puberulous to subhispidulous, largely with ± curved hairs, and often strigillose on or near the nodes. *Leaves* distichous; lamina subovate to ovate to oblong to elliptic (or to lanceolate), 2–21 by 1–9 cm, symmetric, coriaceous or subcoriaceous, apex subacuminate to acute or to obtuse, base (almost) equilateral, rounded to cordate or to cuneate, margin entire, ± revolute or flat; upper surface (sparsely) puberulous to pubescent, mainly on the veins, glabrescent, lower surface ± densely brownish to whitish puberulous to subtomentose, partly with uncinate hairs, also ± densely to sparsely brownish strigillose to subvillous (or hirtellous), only ± sparsely strigillose on the main veins, or only puberulous with uncinate hairs; cystoliths on both sides; midrib prominent to flat above, lateral veins 3–6 pairs, the basal pair up to 1/3–2/3 the length of the lamina, (faintly) branched, tertiary venation scalariform to subreticulate, the smaller veins ± prominent to almost flat 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 subvillous to hirtellous, strigillose and/or puberulous with uncinate hairs, the epidermis persistent or (not soon) flaking off; stipules 0.3–1.2 cm long, sparsely to densely whitish to brownish minutely appressed-puberulous and (sparsely) brown strigillose on the keel and/or the base or only brownish strigillose, caducous or subpersistent. *Figs* axillary and minute on spurs on the older wood, in pairs or (up to 12) clustered; sessile or with a peduncle up to 0.2 cm long; basal bracts 1–1.5 mm long, persistent or caducous; receptacle subglobose, 0.3–0.9 cm diam. when dry, non-stipitate or up to 0.9 cm long stipitate, glabrous, sparsely minutely puberulous, ± densely tomentose, or puberulous (mainly) with uncinate hairs, orange to red at maturity, apex convex, ostiole 0.5–1 mm diam., slightly sunken to flat, usually surrounded by a rim; internal hairs few and small or absent. *Tepals* red.

Distribution — Myanmar to Thailand and Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines.

Habitat — Forest, at altitudes up to 1600(–2600) m.

Notes — 1. The species is quite variable and rather complex in its variation. It is characterized by the presence of uncinate hairs, if the hairs are not very short as in var. *urnigera*. Because of more or less clear discontinuities in the variation five more or less clear-cut varieties can be distinguished. There are few intermediates between var. *recurva* and var. *elegantior*, more between var. *elegantior* and var. *ribesioides*, and very few (or none?) between var. *ribesioides* and var. *urnigera*. Var. *pedicellata* is distinct in the presence of uncinate hairs on the fig receptacle, but it is in other features linked to both var. *elegantior* and var. *ribesioides*.

2. The presence of this species in Lombok could not be verified, as only a branch with bathyphylls has been referred to *F. recurva*.

KEY TO THE VARIETIES

1a. Indumentum on the leafy twigs not uncinate, consisting of very short hairs and on the nodes often strigillose . . . . . **e.** var. **urnigera**
b. Indumentum on the leafy twigs partly uncinate 2
2a. Indumentum on the leafy twigs consisting of ± dense brown more or less crinkled to straight ± appressed hairs intermixed with patent uncinate hairs **a.** var. **recurva**
b. Indumentum on the leafy twigs consisting of patent to retrorse uncinate hairs and on or near the nodes often longer stiff appressed hairs 3
3a. Fig receptacles with uncinate hairs . . . . . **c.** var. **pedicellata**
b. Fig receptacles glabrous or with minute non-uncinate hairs 4
4a. Lamina mostly subcoriaceous and often longer than 10 cm, the tertiary venation mostly slightly prominent beneath; fig receptacle mostly distinctly (up to 0.8 cm long) stipitate . . . . . **b.** var. **elegantior**
b. Lamina coriaceous and mostly shorter than 10 cm, the tertiary venation usually flat beneath; fig receptacle non-stipitate or distinctly (up to 0.8 cm long) stipitate . . . . . **d.** var. **ribesioides**

a. var. **recurva**

Ficus microcarpa Blume, Bijdr. (1825) 442.
Ficus strigosa Blume, Bijdr. (1825) 441; Miq., Fl. Ind. Bat. 1, 2 (1859) 318; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 279, 294.
Ficus leptocarpa Steud., Nomencl. Bot. ed. 2, 1 (1840) 636; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 280, 294, excl. all varieties which are *F. sagittata* J. König ex Vahl.
Ficus spanopheana Miq., London J. Bot. 7 (1848) 451; Fl. Ind. Bat. 1, 2 (1859) 318.
Ficus vilippes Miq., London J. Bot. 7 (1848) 451.
Ficus recurva Blume forma *glabrior* Miq., Fl. Ind. Bat., Suppl. (1861) 432.
Ficus recurva Blume forma *parvifolia* Miq., Fl. Ind. Bat., Suppl. (1861) 432.
Ficus samarensis Merr., Philipp. J. Sci. 18 (1921) 60; Enum. Philipp. Flow. Pl. 2 (1923) 64; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 345.
Ficus recurva Blume var. *lasiocarpa* Corner, Gard. Bull. Singapore 18 (1960) 14.

Leafy twigs (rather) densely (sub)villous to strigillose and puberulous, partly with uncinate hairs. *Lamina* often longer than 10 cm, coriaceous, apex shortly subacuminate to acute; lower surface (rather) densely strigillose to subvillous (or hirtellous) on the main veins, at least the midrib, the shorter hairs partly uncinate; the smaller veins ± prominent beneath; stipules caducous or subpersistent. *Figs* mostly (sub)sessile and receptacle non-stipitate or up to 0.2 mm long stipitate, glabrous, sparsely minutely puberulous, or sometimes ± densely subtomentose.

Distribution — Sumatra, Malay Peninsula, Java, Borneo, Philippines (Catanduanes, Leyte, Samar, Palawan).

Habit — Forest, at altitudes up to 1200 m.

Note — The fig receptacles are mostly (sub)glabrous, but in some collections from N Borneo they are ± densely hairy (var. *lasiocarpa).*

b. var. **elegantior** Corner

Ficus recurva Blume var. *elegantior* Corner, Gard. Bull. Singapore 18 (1960) 14; Kochummen, Tree Fl. Malaya 3 (1978) 154.

Leafy twigs (rather) sparsely puberulous with uncinate hairs, or if strigillose to subvillous, then only at or near the nodes. *Lamina* often longer than 10 cm, mostly subcoriaceous; lower surface sparsely strigillose on the main veins, at least the midrib (or only puberulous with uncinate hairs); the smaller veins mostly slightly prominent beneath; stipules caducous. *Figs* often (shortly) pedunculate and receptacle rather small (mostly 0.3–0.6 cm diam. when dry), distinctly (up to 0.8 cm long) stipitate, (sub)glabrous.

Distribution — Sumatra, Malay Peninsula, Borneo.

Habitat — Forest, at low altitudes.

c. var. **pedicellata** Corner

Ficus recurva Blume var. *pedicellata* Corner, Gard. Bull. Singapore 18 (1960) 15.
Ficus uncinulata Corner, Gard. Bull. Singapore 18 (1960) 15; 21 (1965) 56; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 252.

Leafy twigs densely to sparsely puberulous or hirtellous, (partly) with uncinate hairs. *Lamina* mostly longer than 10 cm, subcoriaceous to coriaceous; lower surface hirtellous to puberulous, partly with uncinate hairs, sometimes also sparsely to densely strigillose on the main veins or only the midrib; the smaller veins ± prominent beneath; stipules caducous. *Figs* mostly (sub)sessile and receptacle often relatively large (0.5–0.9 cm diam. when dry), distinctly stipitate, brownish (to whitish) puberulous, (partly) with uncinate hairs. — **Fig. 99.**

Distribution — Borneo and Philippines (Palawan).

Habitat — Forest, at altitudes up to 1000 m.

Note — Most collections lack stiff appressed hairs on the main veins of the lamina beneath, some have a few such hairs, but the type of var. *pedicellata* has numerous, linking this variety to the other ones.

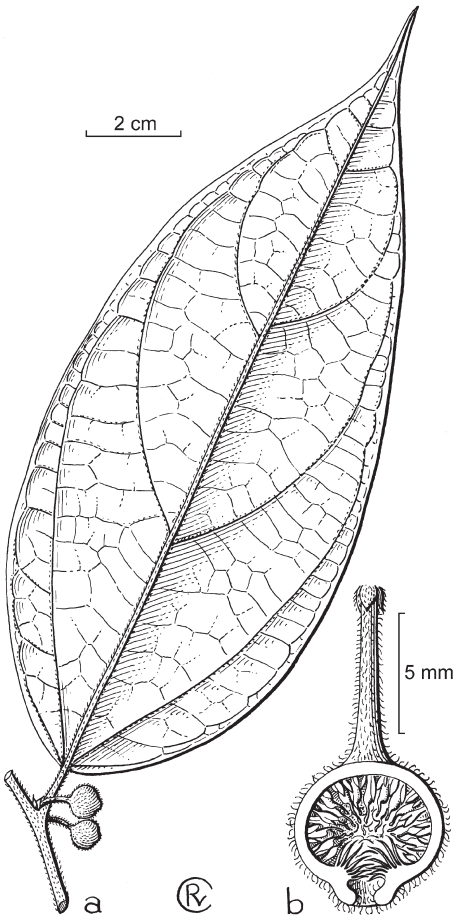

Fig. 99. *Ficus recurva* Blume var. *pedicellata* Corner. a. Twig with leaf and figs; b. fig (all: *SF 30699*).

d. var. **ribesioides** (Wall. ex Miq.) King

Ficus recurva Blume var. *ribesioides* (Wall ex Miq.) King, Sp. Ficus 2 (1888) 132, t. 165B, C; H.P.J. Winkl., Bot. Jahrb. Syst. 49 (1913) 364 (as *F. recurva* Blume); Merr., Enum. Born. (1921) 226 (as *F. recurva* Blume); Corner, Gard. Bull. Singapore 21 (1965) 56; Kochummen, Tree Fl. Malaya 3 (1978) 154. — *Pogonotrophe ribesioides* Wall. ex Miq., London J. Bot. 7 (1848) 78. — *Ficus ribesioides* (Wall. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293; King, Fl. Brit. India 5 (1888) 528.

Ficus strigosa Blume forma *longifolia* Miq., Fl. Ind. Bat. 1, 2 (1859) 318.

Ficus bulusanensis Elmer, Leafl. Philipp. Bot. 9 (1937) 3479; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 347.

Ficus recurva Blume var. *bridelioides* Corner, Gard. Bull. Singapore 18 (1960) 14; Kochummen, Tree Fl. Malaya 3 (1978) 154

Leafy twigs (rather) sparsely puberulous with uncinate hairs, or if strigillose to subvillous, then only at or near the nodes. *Lamina* mostly shorter than 10 cm, coriaceous; lower surface sparsely strigillose on the main veins, at least the midrib (or only puberulous with uncinate hairs); the smaller veins (almost) flat beneath; stipules caducous.

Figs mostly (sub)sessile and receptacle small (mostly 0.3–0.5 cm diam. when dry), non-stipitate or distinctly (up to 0.8 cm long) stipitate, glabrous.

Distribution — Thailand and Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines (Luzon, Leyte, Palawan).

Habitat — Forest, at low altitudes.

Note — Some collections have distinctly stipitate fig receptacles, as it is mostly the case in var. *elegantior*, and others have non-stipitate ones, as it is mostly the case in var. *recurva* and var. *urnigera*.

e. var. **urnigera** (Miq.) King

Ficus recurva Blume var. *urnigera* (Miq.) King, Sp. Ficus 2 (1888) 132, t. 165D. — *Ficus urnigera* Miq. in Zoll., Syst. Verz. 2 (1854) 92, 98; Fl. Ind. Bat. 1, 2 (1859) 318, t. 19A; King, Fl. Brit. India 5 (1888) 528; Corner, Gard. Bull. Singapore 21 (1965) 55; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 253. — *Ficus ramentacea* Roxb. var. *urnigera* (Miq.) Backer, Bekn. Fl. Java 6A (1948) 23. — *Ficus strigosa* Blume var. β Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 279.
Ficus puncticulata auct. non Merr.: Elmer, Leafl. Philipp. Bot. 2 (1908) 547.

Leafy twigs (rather) sparsely minutely puberulous to subhispidulous, largely with ± curved hairs, or if strigillose to subvillous, then only at or near the nodes. *Lamina* mostly shorter than 10 cm, coriaceous; lower surface sparsely strigillose on the main veins, at least the midrib (or only puberulous with uncinate hairs); the smaller veins (almost) flat beneath; stipules caducous. *Figs* (sub)sessile; basal bracts (sub)persistent; receptacle small (mostly 0.3–0.5 cm diam. when dry), mostly non-stipitate, glabrous. — **Fig. 100.**

Distribution — From Myanmar to Thailand and Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines (Negros, Basilan), Celebes (northern).

Habitat — Forest, at altitudes up to 1600(–2600) m.

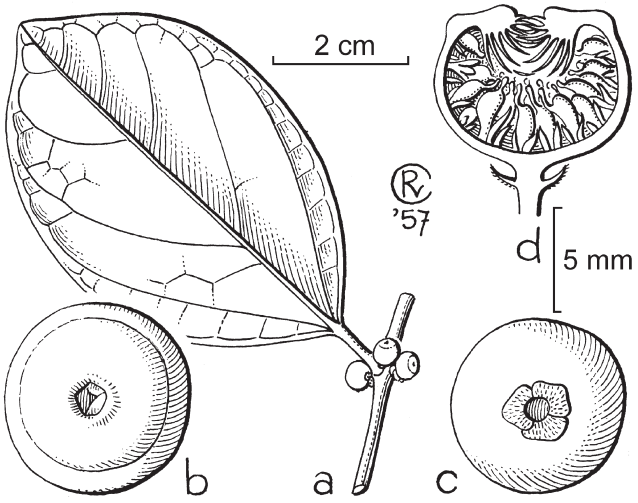

Fig. 100. *Ficus recurva* Blume var. *urnigera* (Miq.) King. a. Twig with leaf and figs; b. ostiole; c. basal bracts; d. fig (all: *SF 25948*).

Notes — 1. Initially, Corner treated this taxon as a variety of *F. recurva*, but later (1960), he decided to raise it (again) to the species level.

2. The only difference between this variety and the form of var. *ribesioides* with non-stipitate or shortly stipitate fig receptacles is the absence of uncinate hairs. In the species the uncinate hairs varies in length, and absence of uncinate hairs could be explained by the strongly reduced length of the hairs, which then can only become curved. The ostiole tend to be wider and not clearly sunken in this variety.

49. Ficus sabahana Kochummen

Ficus sabahana Kochummen, Gard. Bull. Singapore 50 (1998) 211; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 241.

Root-climber. *Branchlets* drying brownish. *Leafy twigs* 2.5–8 mm thick, solid, sparsely hispidulous and ± scabrous or glabrous and smooth. *Leaves* distichous; lamina ovate to elliptic, 12–21 by 6–10.5 cm, symmetric, coriaceous, apex subacuminate, base (almost) equilateral, rounded to cordate, margin entire, ± revolute; upper surface (sub)glabrous, lower surface minutely hispidulous on the veins, or on the midrib also sparsely strigillose, ± scabrous, largely by cystolith hairs; cystoliths on both sides; midrib almost flat, the lateral veins slightly impressed to flat, lateral veins 4 (or 5) pairs, the basal pair up to c. 1/2–2/3 the length of the lamina, (faintly) branched, tertiary venation scalariform, the smaller veins almost flat beneath; waxy glands in the axils of the basal lateral veins and usually also of some other lateral veins; petiole 0.8–3 cm long, sparsely hispidulous, the epidermis flaking off; stipules c. 2 cm long, strigillose on the keel to subglabrous, caducous. *Figs* axillary and on spurs up to 0.5 cm long, with subpersistent up to 0.6 cm long stipules, mostly (up to 3) clustered, subsessile; basal bracts 1–1.5 mm long, persistent or caducous; receptacle subglobose, 0.6–0.8 cm diam. when dry, non-stipitate or up to 0.5 cm long stipitate, (sub)glabrous, reddish at maturity, ostiole c. 1 mm diam., slightly sunken, surrounded by a rim; internal hairs absent. *Tepals* red.

Distribution — Borneo (Sabah).

Habitat — Forest, at low altitudes.

Note — This species shows affinities to *F. recurva*, from which it can be distinguished by the scabridulous lower surface of the lamina and the well-developed, up to 0.5 cm long fig-bearing spurs. It lacks the uncinate hairs, characteristic for (most of the varieties of) *F. recurva*.

50. Ficus sageretina Diels

Ficus sageretina Diels, Bot. Jahrb. Syst. 67 (1935) 225; Corner, Gard. Bull. Singapore 19 (1962) 391, t. 4; 21 (1965) 54.

Ficus amblisyce Corner, Gard. Bull. Singapore 18 (1960) 8; 19 (1962) 388, t. 2; 21 (1965) 53.

Root-climber. *Branchlets* drying dark brown. *Leafy twigs* 1.5–2.5 mm thick, brown (sub)strigillose to brownish subtomentose. *Leaves* distichous; lamina subovate to oblong, 3–11 by 1.2–5.5 cm, symmetric, coriaceous, apex (sub)acuminate, base equi-

lateral, rounded to subcordate, margin entire; upper surface glabrous, lower surface (sub)strigillose on the main veins or also sparsely puberulous on the smaller veins; cystoliths on both sides; midrib prominent above, sometimes raised as a narrow ridge in an impression, lateral veins 4–6 pairs, the basal pair up to c. 1/3–1/2 the length of the lamina, faintly branched, tertiary venation (sub)scalariform, the smaller veins (almost) flat beneath; waxy glands in the axils of the basal lateral veins; petiole 0.6–1.2 cm long, brown (sub)strigillose, the epidermis flaking off; stipules 0.4–1 cm long, (sparsely) brownish (sub)sericeous at least at the apex, caducous. *Figs* axillary or just below the leaves, solitary or in pairs, (also on minute spurs on the older wood?), sessile; basal bracts c. 1.5–2 mm long, caducous (or subpersistent?); receptacle ovoid, subglobose or depressed-globose, 0.5–0.7 cm diam. when dry, non-stipitate, glabrous or brownish substrigillose, orange at maturity, apex ± convex or flat, ostiole c. 0.5–1 mm diam., sunken or prominent, surrounded by a low rim; wall rather thick; internal hairs absent. *Tepals* red.

Distribution — New Guinea.

Habitat — Forest, at altitudes of about 1000 m.

Note — In the present treatment, *F. amblisyce* is included in *F. sageretina*. The three collections examined (*Kochummen F 46392*, *Schlechter 18238*, *Van Royen 3775*) are largely similar in the characters of the vegetative parts, but the figs show clear differences. The receptacles of the first collection are depressed-globose, glabrous, and with a sunken ostiole, those of the second collection are globose, glabrous, and with a prominent ostiole, and those of the third depressed-globose, hairy, and with a sunken ostiole.

51. Ficus sagittata J. König ex Vahl

Ficus sagittata J. König ex Vahl, Symb. Bot. 1 (1790) 83; Vahl, Enum. Pl. 2 (1805) 185; Miq., Fl. Ind. Bat. 1, 2 (1859) 321; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; King, Sp. Ficus 2 (1888) 184; Corner, Gard. Bull. Singapore 18 (1960) 11; 19 (1962) 390, t. 3; 21 (1965) 55; Backer & Bakh.f., Fl. Java 2 (1965) 22; Kochummen, Tree Fl. Malaya 3 (1978) 155; Tree Fl. Sabah & Sarawak 3 (2000) 239.

Ficus compressicaulis Blume, Bijdr. (1825) 439; Miq., Fl. Ind. Bat. 1, 2 (1859) 321; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; King, Sp. Ficus 2 (1888) 180.

Ficus radicans Desf., Cat. Hort. Paris, ed. 3 (1829) 413.

Ficus ramentacea Roxb., Fl. Ind., ed. Carey 3 (1832) 547; Wight, Ic. 2 (1843) t. 657; Kurz, Forest Fl. Burma 2 (1877) 454; King, Sp. Ficus 2 (1888) 135, t. 169; Fl. Brit. India 5 (1888) 528; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 466; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 228; Renner, Bot. Jahrb. Syst. 39 (1907) 401; Merr., Enum. Born. (1921) 226; Koord., Exk. Fl. Java 4 (1924) t. 773, 774; Ridl., Fl. Malay Penins. 3 (1924) 345; Merr., Lingn. Sci. J. 6 (1928–1930) 275, 325; Gagnep., Fl. Indo-Chine 5 (1928) 794; Kaneh., Bot. Mag. Tokyo 49 (1931) 276; Fl. Micron. (1933) 89; En. Micron. (1935) 307; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1013.

Pogonotrophe rigida Miq., London J. Bot. 7 (1848) 74; Fl. Ind. Bat. 1, 2 (1859) 331.

Ficus oligosperma Miq., Pl. Jungh. (1851) 55; Fl. Ind. Bat. 1, 2 (1859) 319. — *Ficus leptocarpa* Steud. var. *oligosperma* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 280. — *Ficus sagittata* J. König ex Vahl var. *oligosperma* (Miq.) Corner, Gard. Bull. Singapore 18 (1960) 12.

Ficus adhaerens Miq., Pl. Jungh. (1851) 55; Fl. Ind. Bat. 1, 2 (1859) 319, t. 22; Becc., For. Borneo (1902) 525; Merr., Enum. Born. (1921) 220. — *Ficus leptocarpa* Steud. var. *adhaerens* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 280. — *Ficus sagittata* J. König ex Vahl var. *adhaerens* (Miq.) Corner, Gard. Bull. Singapore 18 (1960) 12.

Ficus crininervia Miq., Fl. Ind. Bat., Suppl. (1861) 432; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293; King, Sp. Ficus 2 (1888) 138 (excl. Beccari p.p. 951 = *F. camptandra* Diels); Fl. Brit. India 5 (1888) 529; Merr., Enum. Born. (1921) 222.

Ficus subrigida Miq., Fl. Ind. Bat., Suppl. (1861) 433; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295.

Ficus rigescens Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278, 293.

Ficus leptocarpa Steud. var. *borneensis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 280.

Ficus leptocarpa Steud. var. *crassa* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 280.

Ficus leptocarpa Steud. var. *subglabra* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 280.

Ficus leptocarpa Steud. var. *timorensis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 280.

Ficus bordenii Merr., Publ. Gov. Lab. Philipp. 29 (1905) 11; Philipp. J. Sci., 1, Suppl. (1906) 46; Enum. Philipp. Flow. Pl. 2 (1923) 47; Corner, Gard. Bull. Singapore 10 (1939) 107, f. 7, 36; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 250; Corner, Gard. Bull. Singapore 21 (1965) 97. — Type: *T.E. Borden s.n., Forestry Bureau 1211* (iso K), Philippines, Luzon, Lamao River, June 1904, consists of a leafy twig of *F. sagittata* Vahl and a separate fig of *F. punctata*; the former element in K is here designated as lectotype.

Ficus tayabensis Elmer, Leafl. Philipp. Bot. 1 (1907) 255; 4 (1912) 1387; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 66; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 340.

Ficus rubrocarpa Elmer, Leafl. Philipp. Bot. 9 (1937) 3476; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 343.

Ficus ramosii Merr. ex Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 342.

?*Ficus lanoensis* Merr. ex Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 341.

Ficus sagittata J. König ex Vahl var. *minor* Corner, Gard. Bull. Singapore 18 (1960) 12.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–5 mm thick, hollow or solid, ribbed, strigillose to hirtellous to puberulous to glabrous. *Leaves* distichous; lamina elliptic to oblong to (sub)ovate, (4–)10–20(–30) by (1.5–)5–10(–14) cm, symmetric, coriaceous, apex acuminate to acute, base (almost) equilateral, cordate to rounded (or to cuneate), margin entire, 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 up to 1/6–1/3 the length of the lamina, branched (or unbranched), the other lateral veins sometimes furcate far from the margin, tertiary venation scalariform, slightly prominent beneath, the smaller veins (almost) flat beneath; waxy glands in the axils of the basal lateral veins and 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 up to 0.5 cm long spurs on the older wood, in pairs, solitary, or clustered; with a peduncle up to 0.5 cm long or sessile; basal bracts 0.5–2 mm long, caducous (or subpersistent); receptacle subglobose, (0.3–)0.5–1(–1.2) cm diam. when dry, 1.5–2 cm diam. when fresh, 0.1–0.7 cm long stipitate, glabrous or sparsely minutely puberulous, surface often ± pustulate, yellow to red to crimson or to 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.

Distribution — Continental Asia (Andaman Islands, NE India, Sikkim, Bangladesh (Chittagong), Myanmar, Thailand, Indochina, S China) to Malesia and Micronesia (Carolines: Palau); in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines, Celebes, Lesser Sunda Islands (Timor), Moluccas (Talaud, Halmahera, Bacan).

Habitat — Forest, at altitudes up to 1500 m.

Uses — The leaves may be used for smoking with opium.

Notes — 1. This species is rather variable in the dimensions of the lamina and the denseness of the indumentum of the lower surface of the lamina and the stipules.

2. The collections from the Moluccas are distinct by the short stipules (0.5–1 cm long) with a somewhat different indumentum, relatively small fig receptacles, and by the absence of waxy glandular spots. This material resembles *F. pantoniana*, from which it differs by the clear scalariform tertiary venation, the midrib being narrowly prominent above, and the poorly developed spurs.

3. The species resembles *F. villosa*, under which some differences are discussed which can be used to distinguish the two species. However, some collections with rather long and patent hairs, apparently representing material transitional to the bathyphyll-state, can hardly be told apart.

52. Ficus spiralis Corner

Ficus spiralis Corner, Gard. Bull. Singapore 18 (1960) 13; 21 (1965) 56; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 249.

Root-climber. *Stem* with parts bearing leaves alternated with parts bearing only stipules. *Branchlets* drying dark brown. *Leafy twigs* 5–7 mm thick, solid, densely brown strigose to subhirsute to subvillous. *Leaves* distichous; lamina oblong to lanceolate, (15–)20–42 by (6–)8–15 cm, symmetric, subcoriaceous, apex (sub)acuminate to subcaudate, base narrowly (sub)cordate, margin entire, flat to slightly revolute; upper surface sparsely strigillose on the midrib, glabrescent, lower surface strigose to sparsely (sub)hispidulous, on the veins and on the midrib also strigillose (glabrescent) or subhirsute, scabridulous; cystoliths on both surfaces; midrib prominent above, lateral veins 10–16 pairs, the basal pair up to 1/10–1/6 the length of the lamina, branched, tertiary venation scalariform, the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins and most of the other lateral veins; petiole (0.5–)1–3 cm long, densely brown hirtellous to subvillous, the epidermis persistent; stipules 1–3 cm long, brown sericeous, subpersistent. *Figs* axillary, in pairs or (up to 8) clustered and on up to 0.5 cm long spurs on the older wood; sessile; basal bracts 1–1.5 mm long, persistent; receptacle subglobose, 0.4–0.5 cm diam. when dry, non-stipitate to up to 0.1 cm long stipitate, brown hirtellous, yellowish (?) at maturity, apex convex, ostiole c. 0.5 mm diam., slightly sunken; internal hairs absent. *Tepals* red. — **Fig. 101.**

Distribution – Borneo (Sarawak and W Kalimantan).

Habitat — Forest, at low altitudes.

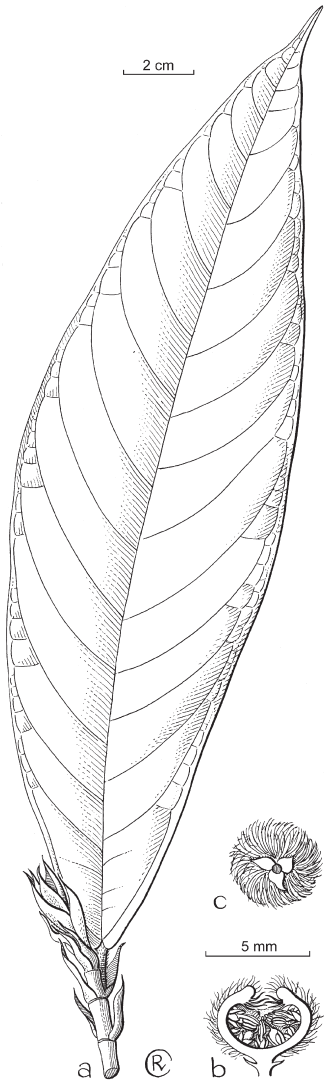

Fig. 101. *Ficus spiralis* Corner. a. Twig with leaf and subpersistent stipules; b. fig; c. basal bracts (all: *Purseglove 4642*).

53. **Ficus supperforata** Corner

Ficus supperforata Corner, Gard. Bull. Singapore 18 (1960) 16; 21 (1965) 57; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 249.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, solid, rather densely puberulous and ± sparsely brown subvillous. *Leaves* distichous; lamina oblong, 8–18 by 4–8 cm, symmetric, coriaceous, apex (sub)acuminate, base (almost) equilateral, rounded to subcordate, margin entire, flat or ± revolute towards the base; upper surface glabrous, lower surface sparsely minutely puberulous on the veins and sparsely brownish subvillous to substrigillose on the main veins; cystoliths

only beneath; midrib ± impressed above, lateral veins 5–7 pairs, the basal pair up to 1/5–1/3 the length of the lamina, close to the margin or not, branched or unbranched, tertiary venation scalariform, the smaller veins ± prominent beneath, the areoles small and foveolate beneath; waxy glands in the axils of the basal lateral veins and also of some other lateral veins; petiole 1–3 cm long, puberulous and sparsely subvillous, the epidermis persistent; stipules (0.8–)1–1.5 cm long, densely minutely whitish appressed-puberulous and brown (sub)strigillose on the keel, caducous. *Figs* axillary, in pairs or (up to 6) clustered, also on up to 0.3 cm long spurs on the older wood, sessile; basal bracts c. 1 mm long, (sub)persistent; receptacle subglobose, 0.5–0.8 cm diam. when dry, 0.3–0.6 cm long stipitate, often ± pustulate, minutely brown puberulous to subpulverulent, orange at maturity, apex convex, ostiole 0.5–1 mm diam., flat to slightly prominent; internal hairs sparse. *Tepals* red.

Distribution — Borneo.

Habitat — Forest, at low altitudes.

Note — This species resembles *F. villosa*, from which it can be distinguished by the smaller number of lateral veins and the foveolate lower surface of the lamina.

54. Ficus villosa Blume

Ficus villosa Blume, Cat. (1823) 37; Bijdr. (1825) 441; Miq., London J. Bot. 7 (1848) 451; Fl. Ind. Bat. 1, 2 (1859) 317, t. 21A; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 294; King, Sp. Ficus 2 (1888) 137; Fl. Brit. India 5 (1888) 529; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 235; Merr., Philipp. J. Sci., 1, Suppl. (1906) 44; Elmer, Leafl. Philipp. Bot. 1 (1906) 201; Renner, Bot. Jahrb. Syst. 39 (1907) 402; Elmer, Leafl. Philipp. Bot. 4 (1911) 1263; Merr., Enum. Born. (1921) 228; Enum. Philipp. Flow. Pl. 2 (1923) 68; Ridl., Fl. Malay Penins. 3 (1924) 345; Koord., Exk. Fl. Java 4 (1924) t. 776; Gagnep., Fl. Indo-Chine 5 (1928) 801; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 346; Backer, Blumea 6 (1948) 309; Corner, Gard. Bull. Singapore 19 (1962) 390, t. 3; Backer & Bakh.f., Fl. Java 2 (1965) 22; Corner, Gard. Bull. Singapore 21 (1965) 56; Kochummen, Tree Fl. Malaya 3 (1978) 161; Tree Fl. Sabah & Sarawak 3 (2000) 250.

Ficus barbata Wall. ex Miq., London J. Bot. 7 (1848) 441; Fl. Ind. Bat. 1, 2 (1859) 321; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295.

Ficus barbata Wall. ex Miq. var. *glabriuscula* Miq., Pl. Jungh. (1851) 293; Fl. Ind. Bat. 1, 2 (1859) 321.

Ficus hirsuta Wall. ex Miq., Fl. Ind. Bat. 1, 2 (1859) 317, t. 21A, non Spreng. 1827 nec Roxb. 1832.

Ficus dives Miq., Choix Pl. Buitenzorg (1864) t. 12.

Ficus grossivenis Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 227, 294; King, Sp. Ficus 2 (1888) 181; Boerl., Handl. 3 (1900) 369; Merr., Enum. Born. (1921) 224; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 344 (sub *F. crininervia* Miq.); Corner, Gard. Bull. Singapore 21 (1965) 55; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 250.

Ficus propinqua Merr., Publ. Gov. Lab. Philipp. 29 (1905) 8; Enum. Philipp. Flow. Pl. 2 (1923) 62; Elmer, Leafl. Philipp. Bot. 1 (1906) 60; 1 (1907) 259; 1 (1908) 546; 7 (1914) 2399; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 345.

Ficus lagunensis Merr., Philipp. J. Sci., Bot. 9 (1914) 273; Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 344.

Ficus jaroensis Merr., Philipp. J. Sci., Bot. 10 (1915) 268; Enum. Philipp. Flow. Pl. 2 (1923) 55; Elmer, Leafl. Philipp. Bot. 9 (1937) 3484; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 343.

Ficus villosa Blume var. *appressa* Corner, Gard. Bull. Singapore 18 (1960) 12.

Ficus villosa Blume var. *subglobosa* Corner, Gard. Bull. Singapore 18 (1960) 13; Miq., Fl. Ind. Bat. 1, 2 (1859) 317, t. 21B.

Ficus villosa Blume var. *tonsa* Corner, Gard. Bull. Singapore 18 (1960) 13.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 3–6 mm thick, hollow or solid, ribbed, densely brown hirtellous to subhirsute to subvillous (or to subvelutinous), the longer and stiff hairs often with ± swollen bases. *Leaves* distichous; lamina subovate (to ovate or to lanceolate) to oblong (to elliptic), 9–30 by 4.5–11 cm, symmetric, (sub)coriaceous, apex subacuminate to subacute, base (almost) equilateral, cordate to rounded (or to obtuse), margin entire, ± revolute; upper surface brown hirtellous to puberulous or strigillose, mainly in the main veins, glabrescent, often ± bullate, lower surface ± densely hirtellous to subhirsute or to subtomentose (or strigillose) on the veins, the longer and stiff hairs distributed evenly (and with their bases not strongly swollen) to ± 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 impressed above, lateral veins 6–10 pairs, prominent beneath, the basal pair up to 1/6–1/3 the length of the lamina, branched, the other lateral veins often branched or furcate far from the margin, tertiary venation scalariform, prominent beneath, the smaller veins ± 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 not soon flaking off; stipules (0.5–)1–3 cm long, densely to sparsely whitish minutely appressed-puberulous and brown substrigillose to hirtellous on the keel and at the base, caducous or subpersistent. *Figs* axillary, in pairs or (up to 8) clustered, also on up to 1 cm long spurs on the older wood, often with up to 0.6 cm long subpersistent stipules at the apex; peduncle 0.1–0.7 cm long (or sessile); basal bracts 1.5–2 mm long, caducous; receptacle subglobose to ovoid (or ellipsoid), 0.3–1.3 cm diam. when dry, 0.8–1.8 cm diam. when fresh, 0.1–1 cm long stipitate, brownish subtomentose to puberulous or glabrous (and then often pustulate), yellow to orange to crimson at maturity, apex ± umbonate or convex and the ostiole surrounded by a rim, ostiole c. 1 mm diam., ± sunken; internal hairs abundant, sparse and small, or absent. *Tepals* red.

Distribution — Continental Asia (Andaman Islands, NE India, Myanmar, S China, Indochina, Thailand) to Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines (Luzon, Mindanao, Palawan), Celebes, Moluccas (Talaud, Ceram).

Habitat — Forest, at altitudes up to c. 1700 m.

Notes — 1. In the present concept of the species, *F. grossivenis* is included. Material under this name represents a form rare in Sumatra, the Malay Peninsula, and Java, more common in (northern) Borneo, predominant in the Philippines, Celebes, and the Moluccas. It is distinct in an uneven distribution of the stiff hairs (as on the main veins of the lower surface of the lamina) and in the regions where this form is common, also by the (usually) glabrous and relatively large fig receptacles, often with a pustulate surface. The more typical *F. villosa* material and that of the *F. grossivenis*-form are linked by intermediates with regard to the indumentum on the lamina and fig receptacles, as well as to the dimensions of these receptacles.

2. This species is quite similar to *F. sagittata* in the shape, dimensions, and venation of the lamina. Due to the variation of the indumentum in *F. sagittata*, from very sparse on the main veins of the lamina to rather dense (although mostly by appressed hairs), it is difficult to distinguish the two species. *Ficus villosa* can be distinguished from

F. sagittata by the prominent veins, secondary, tertiary, and smaller veins of the lower surface of the lamina, often also by the minute bullate areoles of the lower surface, and the (more distinctly) swollen bases of the stiff hairs.

3. *Ficus villosa* also shows strong affinities to *F. lanata*, under which similarities and differences are discussed.

4. Some collections from northern Borneo are somewhat distinct by their lanceolate laminas.

Section Rhizocladus subsection Trichocarpeae

Ficus L. subg. *Synoecia* (Miq.) Miq. sect. *Rhizocladus* Endl. subsect. *Trichocarpeae* (Corner) C.C. Berg, Blumea 48 (2003) 554. — *Ficus* L. subg. *Ficus* sect. *Rhizocladus* Endl. ser. *Trichocarpeae* Corner, Gard. Bull. Singapore 18 (1960) 5.

Indumentum consisting of straight hairs without (distinctly) swollen bases; the pluricellular trichomes oblongoid-capitate. *Leafy twigs* eglandular. *Lamina* often ovate to (sub)cordiform. *Stipules* short and the terminal buds rather thick; petiole short. *Figs* axillary, mostly in pairs, pedunculate, occasionally sessile; basal bracts persistent, occasionally caducous, often spreading to ± reflexed; receptacle (sub)globose, non-stipitate (or substipitate); ostiole often ± prominent. *Tepals* usually red. *Staminate* and *neuter flowers* scattered among the pistillate ones; filaments free (or basally connate), anthers lanceolate to oblong in outline. *Ovaries* of the short-styled flower red-brown. *Fruits* ± compressed, not keeled.

Distribution — This subsection with 10 species ranges from the Asian mainland to the Solomon Islands; 9 species are elements of the Malesian region. *Ficus trichocarpa*, extending to the Asian mainland, and the two closely related species, *F. bakeri* and *F. perfulva* (from the Philippines), are western Malesian, the other species are confined to eastern New Guinea and New Britain, and *F. nasuta* Summerh. to the Solomon Islands.

Notes — 1. This subsection is the least specialized one, with regard to the indumentum and figs, showing resemblances with subg. *Ficus*, in particular with sect. *Eriosycea*.

2. Distinctly pedunculate figs with well-developed basal bracts are characteristic for subsect. *Trichocarpeae*, but a few collections differ in having (sub)sessile figs (*F. hypophaea*) or caducous basal bracts (*F. bakeri*).

3. The lower surface of the lamina tends to become subtessellate in some species, as in *F. trichocarpa*, but in contrast to the truly tessellate laminas of sect. *Kissosycea*, the veins are hairy.

55. Ficus bakeri Elmer

Ficus bakeri Elmer, Leafl. Philipp. Bot. 7 (1914) 2402; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 45; Elmer, Leafl. Philipp. Bot. 9 (1937) 3466; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 348; Corner, Gard. Bull. Singapore 21 (1965) 59.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 1–2 mm thick, solid, densely to sparsely brown to whitish puberulous to tomentose or tomentellous, or partly hirtel-

lous. *Leaves* distichous; lamina ovate to elliptic, (2–)4–9 by (1–)2–5 cm, symmetric, (sub)coriaceous, apex shortly and bluntly (sub)acuminate to obtuse, base equilateral, rounded to subcordate or to obtuse, margin entire, slightly revolute; upper surface sparsely (to rather densely) brownish puberulous to subtomentose to pubescent mainly on the veins, glabrescent, lower surface sparsely appressed-puberulous to pubescent on the veins; cystoliths on both sides; midrib flat above, lateral veins 3 or 4 (or 5) pairs, the basal pair up to c. 1/2 the length of the lamina, branched, the other lateral veins sometimes branched, tertiary venation scalariform, the smaller veins (almost) flat beneath; waxy glands in the axils of the basal lateral veins and of some other lateral veins; petiole 1–1.5(–1.8) cm long, ± densely brown puberulous, the epidermis persistent; stipules 0.3–0.6 cm long, brownish appressed-puberulous to subsericeous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.2–0.5 cm long; basal bracts 1–1.5 mm long, persistent (or caducous); receptacle subglobose, 0.4–0.6 cm diam. when dry, non-stipitate or substipitate, densely to rather sparsely whitish tomentellous, dark red at maturity, apex ± umbonate, ostiole c. 1 mm diam., slightly prominent; internal hairs sparse or absent. *Tepals* of long-styled flowers red, those of short-styled and staminate flowers yellowish and indurated.

Distribution — Philippines (Luzon, Mindoro, Negros, Mindanao).

Habitat — Lowland and montane forest.

Uses — The inner bark is used for bowstrings.

Notes — 1. This species shows clear affinities to *F. perfulva*.

2. Collection *Coode 5515* (from Mindoro) matches the other collection, except for the caducous basal bracts.

56. Ficus cinnamomea Corner

Ficus cinnamomea Corner, Gard. Bull. Singapore 18 (1960) 21; 21 (1965) 60.
Ficus hypophaeola Corner, Gard. Bull. Singapore 18 (1960) 21; 21 (1965) 60.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 1.5–2.5 mm thick, solid, densely (pale) brown tomentose to floccose-tomentose. *Leaves* distichous; lamina (sub)ovate to elliptic to oblong, 2.5–9 by 1.2–3.5 cm, symmetric, coriaceous, apex acuminate, base equilateral, rounded to obtuse, margin entire, flat to slightly revolute towards the base; upper surface glabrous, lower surface densely (pale) brown floccose-tomentose, the main veins ± glabrescent; cystoliths only beneath or absent; midrib slightly prominent above, lateral veins 4 or 5 pairs, the basal pair up to c. 1/3–1/2 the length of the lamina, branched, tertiary venation reticulate, the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins; petiole (0.7–)1–4.5 cm long, (pale) brown floccose-tomentose, the epidermis flaking off; stipules 0.4–0.5 cm long, (pale) brown floccose-tomentose, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.5–1.2 cm long; basal bracts c. 3 mm long, persistent, often ± deflexed; receptacle subglobose, c. 0.6–1 cm diam. when dry, non-stipitate, pale brown floccose-tomentose, (glabrescent?), red at maturity, apex convex, ostiole c. 1 mm diam., flat, surrounded by a low rim; internal hairs absent. *Tepals* red. — **Fig. 102.**

Distribution — New Guinea.

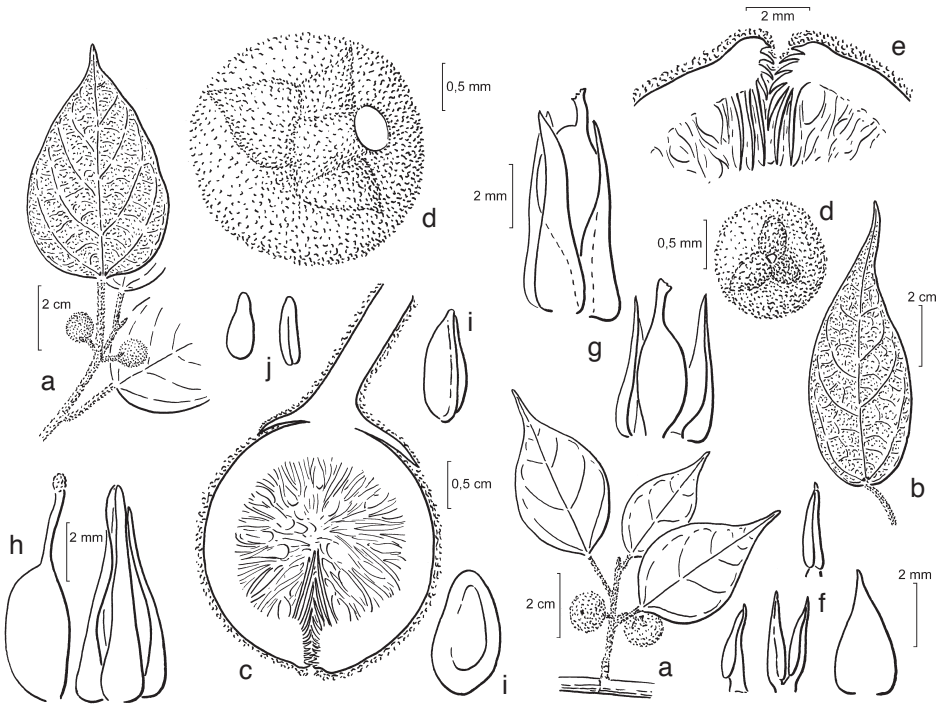

Fig. 102. *Ficus cinnamomea* Corner. a. Leafy twigs with figs; b. leaf; c. fig; d. basal bracts; e. ostiole; f. staminate flowers; g. short-styled flowers; h. long-styled flowers and separate pistil; i. fruits; j. embryos (all: collections used unknown). From Philos. Trans., Ser. B, 273 (1976) 380.

Habitat — Montane (and lowland) forest, at altitudes up to 2000 m.

Notes — 1. *Ficus hypophaeola* is included in this species as the differences with the material of *F. cinnamomea* are too small to maintain it as a species.

2. This species shows affinities to *F. pleiadenia*.

57. Ficus hypophaea Schltr.

Ficus hypophaea Schltr., Guttapercha Kautsch. Exp. (1911) 129; Diels, Bot. Jahrb. Syst. 67 (1935) 226; Summerh., J. Arnold Arbor. 22 (1941) 106; Corner, Gard. Bull. Singapore 21 (1965) 60.

Root-climber. *Branchlets* drying brown to blackish; scars of the petioles often prominent. *Leafy twigs* 3–7 mm thick, solid, minutely whitish puberulous to tomentellous and often also whitish floccose-subvillous or brown subhirsute to villous. *Leaves* distichous; lamina cordiform to ovate to elliptic, 7–20 by 4–15 cm, symmetric, coriaceous, apex (sub)acuminate, base equilateral, rounded to cordate (or to obtuse), margin entire, ± revolute; upper surface sparsely puberulous on the main veins, glabrescent, lower surface densely brown floccose-tomentose on the main veins to subvillous or substrigose; cystoliths only beneath; midrib slightly prominent above, lateral veins 3–5 pairs, the basal pair up to c. 1/2–3/4 the length of the lamina, branched, the other lateral veins

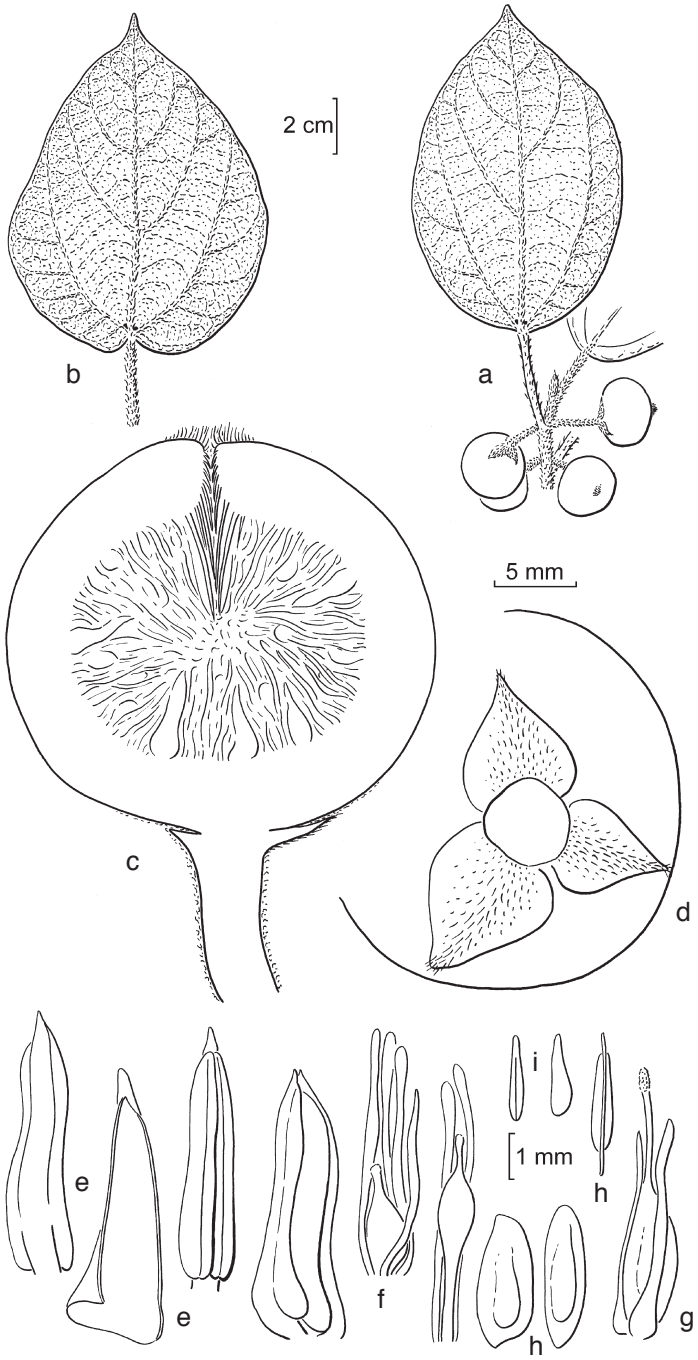

Fig. 103. *Ficus hypophaea* Schltr. a. Leafy twig with figs; b. leaf; c. fig; d. basal bracts; e. staminate flowers and stamens; f. short-styled flowers; g. long-styled flower; h. fruits; i. embryos (all: collections used unknown). From Philos. Trans., Ser. B, 273 (1976) 379, 380.

often branched or furcate far from the margin, tertiary venation scalariform, the smaller veins ± prominent beneath; waxy glands in the axils of the basal lateral veins or also of some other lateral veins and in axils of branches of lateral veins; petiole 1.5–6(–7.5) cm long, densely brown floccose-tomentose, the epidermis flaking off; stipules 0.6–1.8 cm long, brownish to whitish subvillous to subhirsute, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; with a peduncle 0.2–1.4 cm long or subsessile; basal bracts (3–)5–7(–10) mm long, persistent; receptacle subglobose, 1.2–2.5 cm diam. when dry, non-stipitate, densely brownish to whitish floccose-tomentose or pale brown woolly-villous, often glabrescent, but persistent around the ostiole, colour at maturity unknown, apex ± umbonate to apiculate, ostiole c. 1–2 mm diam., ± prominent to slightly sunken; internal hairs sparse and short or absent. *Tepals* red. — **Fig. 103.**

Distribution — New Guinea (eastern).

Habitat — Montane or submontane forest, at altitudes between 600 and 2000 m.

Note — This species resembles *F. supfiana* in the dimensions of the lamina and the figs and in the length of the basal bracts, but it is clearly distinct in the dense floccose indumentum on the lower surface of the lamina and on the fig receptacle. In contrast to *F. supfiana*, it is a species of (sub)montane forest.

58. Ficus jimiensis C.C. Berg

Ficus jimiensis C.C. Berg, Blumea 48 (2003) 559.
Ficus nasuta Summerh. var. *glabrata* Corner, Gard. Bull. Singapore 18 (1960) 19.

Root-climber. *Branchlets* drying dark brown. *Leafy twigs* 2–8 mm thick, hollow, glabrous. *Leaves* distichous; lamina cordiform (to elliptic), (4.5–)8–22 by (2.5–)5–16 cm, symmetric, (sub)coriaceous, apex (sub)acuminate, base equilateral, cordate (to rounded), margin entire, flat to slightly revolute; both surfaces glabrous; cystoliths only beneath; midrib flat to slightly impressed above, lateral veins 4 or 5 (or 6) pairs, the basal pair up to c. 1/2 the length of the lamina, branched, the other lateral veins often branched or furcate far from the margin, tertiary venation scalariform, the smaller veins slightly prominent beneath; waxy glands in the axils of the basal lateral veins and of some other lateral veins or also in the axils of branches of lateral veins; petiole (1.5–)2.5–7.5 cm long, glabrous, the epidermis flaking off; stipules 0.5–1.5 cm long, brownish to whitish appressed-puberulous to subsericeous, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.8–3 cm long; basal bracts 2–3 mm long, persistent, often spreading to slightly deflexed; receptacle subglobose, (1.2–)1.5–2.5 cm diam. when dry, 1.5–3 cm diam. when fresh, non-stipitate or substipitate, glabrous, yellow to orange to red at maturity, apex ± umbonate, ostiole c. 1 mm diam., slightly prominent; internal hairs sparse and short or absent. *Tepals* red.

Distribution — New Guinea (eastern, incl. New Britain).

Habitat — Lowland and montane forest, at altitudes up to c. 1900 m.

Note — This species, initially recognized as a variety of *F. nasuta*, is currently treated as a distinct species. It differs from *F. nasuta* (confined to the Solomon Islands), e.g., in the absence of indumentum on all parts, except for the stipules, the glabrous and larger fig receptacle, normally 1.5–2.5 cm diam., which is up to c. 1.2 cm diam. when dry and mostly densely hairy in *F. nasuta*. Moreover, the lamina is in average longer

and cordiform to ovate with a deeply cordate to subcordate base in *F. jimiensis,* but it is elliptic to broadly ovate with an obtuse to subcordate base in *F. nasuta*, the petioles are mostly longer than 3 cm in *F. jimiensis* and usually shorter than 3 cm in *F. nasuta,* and the internal bristles are sparse or absent in *F. jimiensis* but abundant in *F. nasuta*.

59. Ficus perfulva Elmer ex Merr.

Ficus perfulva Elmer ex Merr., Enum. Philipp. Flow. Pl. 2 (1923) 61; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 349; Corner, Gard. Bull. Singapore 21 (1965) 59.
Ficus fulva Elmer, Leafl. Philipp. Bot. 7 (1914) 2407, non Reinw. ex Blume 1825.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, solid, densely brown puberulous to hirtellous to subvillous. *Leaves* distichous; lamina ovate to cordiform or to elliptic, 3–10 by 2–7 cm, symmetric, coriaceous, apex (sub)acuminate, base equilateral, subcordate to rounded (to obtuse), margin entire, ± revolute; upper surface puberulous to hirtellous to strigillose, scabridulous to smooth, sometimes ± bullate, lower surface ± densely dark brown tomentose to hirtellous to substrigillose on the veins; cystoliths only beneath; midrib ± prominent above, lateral veins 4–6 pairs, the basal pair up to c. 1/2 the length of the lamina, branched, tertiary venation scalariform, the smaller veins ± prominent beneath; waxy glands in the axils of the basal lateral veins, often also in the axils of some other lateral veins and the axils of branches of the lateral veins; petiole 1–1.5(–1.8) cm long, ± densely dark brown puberulous to subvelutinous, the epidermis persistent; stipules 0.3–0.8 cm long, brown (to partly whitish) hirtellous to subsericeous, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.2–0.5 cm long; basal bracts 1.5–2 mm long, persistent; receptacle subglobose, 0.7–1 cm diam. when dry, non-stipitate or substipitate, densely brown to whitish (minutely) puberulous to tomentose, colour at maturity unknown, apex ± umbonate to convex, ostiole 1–1.5 mm diam., slightly prominent; internal hairs rather sparse. *Tepals* red(dish).

Distribution — Philippines (Luzon, Mindanao).

Habitat — Forest, at altitudes up to c. 1100 m.

Note — This species shows clear affinities to *F. bakeri* and *F. trichocarpa*, and similarities to *F. phaeobullata* (from New Guinea).

60. Ficus phaeobullata Corner

Ficus phaeobullata Corner, Gard. Bull. Singapore 18 (1960) 20; 21 (1965) 59.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, solid, densely dark brown subtomentose. *Leaves* distichous; lamina ovate to subovate to elliptic, 6–10 by 3–6 cm, symmetric, coriaceous, apex (sub)acuminate to acute, base equilateral, rounded to subcordate, margin entire, revolute; upper surface puberulous, mainly on the veins, bullate, lower surface densely brown hirtellous to (sub)tomentose on the veins; cystoliths only beneath; midrib and other veins ± impressed above, lateral veins 3–5 pairs, the basal pair up to c. 1/2–2/3 the length of the lamina, branched, tertiary venation (sub)scalariform, the smaller veins ± prominent beneath; waxy glands in the axils of the basal lateral veins; petiole 1–2 cm long, ± densely dark brown pu-

berulous, the epidermis persistent; stipules 0.3–0.8 cm long, dark brown puberulous to subtomentose, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.5–0.9 cm long; basal bracts 1.5–2 mm long, persistent; receptacle subglobose, 1–1.2 cm diam. when dry, 0.2–0.3 cm long stipitate, (sub)glabrous, colour at maturity unknown, apex convex, ostiole c. 1–1.5 mm diam., slightly prominent; internal hairs sparse. *Tepals* red(dish).

Distribution — New Guinea (eastern).

Habitat — Rock in open savannah-land at c. 350 m (type collection).

Note — This species resembles *F. pervulva* (from the Philippines), from which it differs in the (sub)glabrous fig receptacle.

61. Ficus pleiadenia Diels

Ficus pleiadenia Diels, Bot. Jahrb. Syst. 67 (1935) 187; Corner, Gard. Bull. Singapore 21 (1965) 59.
Ficus alococarpa Diels, Bot. Jahrb. Syst. 67 (1935) 228; 21 (1965) 59; C.C. Berg, Blumea 48 (2003) 555.
Ficus semilanata Corner, Gard. Bull. Singapore 18 (1960) 20; 21 (1965) 59.

Root-climber. *Branchlets* drying brown to blackish; scars of the petioles often prominent. *Leafy twigs* 2–3 mm thick, solid, minutely brownish puberulous often sparsely brown substrigillose. *Leaves* distichous or in lax spirals; lamina (sub)ovate to elliptic to oblong, (2–)4–9 by (1–)2–5.5 cm, symmetric, coriaceous, apex (sub)acuminate (to acute), base (almost) equilateral, rounded to cordate or to obtuse, margin entire, flat or slightly revolute towards the base; upper surface glabrous or sparsely puberulous to substrigillose, glabrescent, lower surface (very) sparsely appressed-puberulous to subtomentose, on the main veins to substrigillose; cystoliths only beneath; midrib slightly prominent above, lateral veins 3–5(–6) pairs, the basal pair up to (1/4–)1/3–1/2 the length of the lamina, (faintly) branched, tertiary venation reticulate to subscalariform, the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins, sometimes inconspicuous; petiole (0.3–)1–2.5(–3.5) cm long, brown puberulous to subtomentose and partly substrigillose, the epidermis flaking off; stipules 0.3–0.8 cm long, brownish to greyish subsericeous to hirtellous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.3–1.5 cm long; basal bracts 1–2 mm long, persistent, often ± deflexed; receptacle subglobose, 0.4–1 cm diam. when dry, 1.5–2 cm diam. when fresh, non-stipitate or substipitate, sparsely to densely whitish to brownish appressed-puberulous, orange to red to blackish at maturity, apex convex to slightly umbonate, ostiole c. 1 mm diam., ± prominent to flat: internal hairs sparse and short or absent. *Tepals* red.

Distribution — New Guinea (eastern).

Habitat — Forest, at altitudes between 500 and 1600 m.

Notes — 1. In the present concept, the species includes *F. semilanata*. The differences (mainly in the indumentum) proved too small to maintain distinct taxa. *Ficus alococarpa* is also included through lectotypification.

2. This species shows affinities to *F. cinnamomea*, from which it differs in the sparse indumentum of the lower surface of the lamina and the shorter basal bracts of the figs.

62. Ficus supfiana Schltr.

Ficus supfiana Schltr., Guttapercha Kautsch. Exp. (1911) 130; Diels, Bot. Jahrb. Syst. 67 (1935) 227; Corner, Gard. Bull. Singapore 21 (1965) 59.

Root-climber. *Branchlets* drying brown; scars of the petioles often prominent. *Leafy twigs* 2–4 mm thick, solid, minutely whitish puberulous and often also whitish strigillose to subvillous. *Leaves* distichous; lamina ovate to elliptic or to subcordiform, 9–18 by 5–13 cm, symmetric, coriaceous, apex (sub)acuminate, base equilateral, rounded to subcordate, margin entire, flat to slightly revolute; upper surface glabrous, lower surface sparsely substrigillose to subvillous to appressedly puberulous on the main veins (or only the midrib), the basal part of the midrib or also the basal parts of the basal lateral veins densely minutely white puberulous; cystoliths only beneath; midrib slightly prominent above, lateral veins 4 or 5 pairs, the basal pair up to c. 1/2(–2/3) the length of the lamina, branched, the other lateral veins often branched or furcate far from the margin, tertiary venation scalariform, the smaller veins slightly prominent to flat beneath; waxy glands in the axils of the basal lateral veins; petiole 1–3.5 cm long, densely minutely white puberulous and also ± sparsely strigillose to subvillous, the epidermis flaking off; stipules 0.5–0.9 cm long, pale brown to whitish subsericeous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.4–0.8 cm long; basal bracts 3–6 mm long, persistent; receptacle subglobose, (0.7–)1–1.6 cm diam. when dry, c. 1.5–2 cm diam. when fresh, non-stipitate, densely whitish floccose-tomentose, glabrescent, but persistent around the ostiole, colour at maturity unknown, apex ± umbonate to apiculate, ostiole c. 1 mm diam., ± prominent; internal hairs sparse and short or absent. *Tepals* red.

Distribution — New Guinea (eastern, incl. New Britain).

Habitat — Forest, at low altitudes.

Note — This species can be recognized by the relatively large laminas, mostly longer than 10 cm, the indumentum of the leafy twigs and the midrib of the lamina beneath consisting of dense minute whitish hairs and distinctly longer hairs and the long basal bracts. It shows clear affinities to *F. hypophaea*.

63. Ficus trichocarpa Blume

Ficus trichocarpa Blume, Bijdr. (1825) 458; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; King, Sp. Ficus 2 (1888) 185; Corner, Gard. Bull. Singapore 18 (1960) 59; 21 (1965) 59; Backer & Bakh.f., Fl. Java 2 (1965) 22; Kochummen, Tree Fl. Malaya 3 (1978) 159; Tree Fl. Sabah & Sarawak 3 (2000) 254. — *Ficus hampelos* Steud., Nomencl. Bot. ed. 2, 1 (1840) 636. — *Urostigma trichocarpum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 338.

Ficus filiformis Blume, Bijdr. (1825) 442; Miq., Fl. Ind. Bat. 1, 2 (1859) 321; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295; King, Sp. Ficus 2 (1888) 181.

Ficus obtusa Hassk., Cat. Hort. Bog. (1844) 75; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 278, 293; King, Sp. Ficus 2 (1888) 130, t. 163; Fl. Brit. India 5 (1888) 527; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 224 (as var. *genuina*); Merr., Philipp. J. Sci. 18 (1921) 61; Enum. Born. (1921) 225; Enum. Philipp. Flow. Pl. 2 (1923) 59; Koord., Exk. Fl. Java 4 (1924) t. 771; Gagnep., Fl. Indo-Chine 5 (1928) 820; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 349. — *Ficus trichocarpa* Blume var. *obtusa* (Hassk.) Corner, Gard. Bull. Singapore 18 (1960) 19.

Pogonotrophe javana Miq., London J. Bot. 7 (1848) 75; Fl. Ind. Bat. 1, 2 (1859) 330.

Pogonotrophe phaeopoda Miq., London J. Bot. 7 (1848) 76; Pl. Jungh. (1851) 52; Fl. Ind. Bat. 1, 2 (1859) 331. — *Ficus phaeopoda* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293.

Pogonotrophe piperifolia Miq. in Zoll., Syst. Verz. 2 (1854) 93, 99; Fl. Ind. Bat. 1, 2 (1859) 330. — *Ficus piperifolia* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293. — *Ficus obtusa* Hassk. var. *piperifolia* (Miq.) Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 227. — *Ficus trichocarpa* Blume var. *piperifolia* (Miq.) Corner, Gard. Bull. Singapore 18 (1960) 10.

Ficus platycaula Miq., Fl. Ind. Bat. 1, 2 (1859) 318.

Pogonotrophe borneensis Miq., Fl. Ind. Bat. 1, 2 (1859) 330. — *Ficus piperifolia* (Miq.) Miq. var. *borneensis* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 293. — *Ficus trichocarpa* Blume var. *borneensis* (Miq.) Corner, Gard. Bull. Singapore 18 (1960) 19.

Pogonotrophe pyrrhopoda Miq., Fl. Ind. Bat., Suppl. (1861) 435. — *Ficus pyrrhopoda* (Miq.) King, Sp. Ficus 2 (1888) 183.

Ficus obtusa Hassk. var. *gedehensis* Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 227.

Ficus ahernii Merr., Philipp. J. Sci. 18 (1921) 61; Enum. Philipp. Flow. Pl. 2 (1923) 44; Elmer, Leafl. Philipp. Bot. 9 (1937) 3478; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 350.

Ficus tawaensis Merr., Univ. Calif. Publ. Bot. 15 (1929) 48; Corner, Gard. Bull. Singapore 10 (1939) 146, f. 27, 35; 21 (1965) 99, as *F. tawaoensis*. — Type: *Elmer 20531* (iso K, L), Borneo, near Tawao, consists of leaves of *F. trichocarpa* intermediate between bathyphylls and acrophylls, and fig-bearing branchlets (L) and figs probably of *F. punctata* Thunb.; the former element in L is designated as lectotype here.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, solid, densely brown puberulous to hirtellous to velutinous or to sparsely puberulous. *Leaves* in lax spirals; lamina elliptic to oblong to ovate to subovate to cordiform or to suborbicular, 4–14 by 3–10 cm, symmetric, coriaceous (to chartaceous), apex acuminate (mostly shortly and bluntly) to acute to obtuse (to rounded), base equilateral, cordate to rounded to obtuse, margin entire, ± revolute to flat; upper surface hispidulous to puberulous, ± scabrous, lower surface ± densely to sparsely brown to whitish puberulous to substrigillose to subhirtellous on the main veins and densely to rather sparsely white tomentose to tomentellous or to puberulous on the smaller veins or only sparsely appressed-puberulous on the main veins; cystoliths only beneath and sparse or absent; midrib ± impressed (the lower part) to flat (the upper part) above, lateral veins 4–6 pairs, the basal pair up to 1/2–2/3 the length of the lamina, branched, most other lateral veins branched or furcate far from the margin, tertiary venation scalariform, the smaller veins ± prominent beneath; waxy glands in the axils of the basal lateral veins, 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, ± 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, with a peduncle up to 1.2 cm long (or sessile); basal bracts 1.5–3 mm long, persistent; receptacle subglobose, 0.8–1.2(–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 to red-brown to scarlet or to wine-red at maturity, apex ± umbonate, ostiole c. 1 mm diam., slightly prominent to flat; internal hairs abundant. *Tepals* red(dish). *Stamens* 2.

Distribution — From Indochina and Thailand to Malesia; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines, Lesser Sunda Islands (Sumba, Sumbawa, Flores), Moluccas.

Habitat — Forest, at altitudes up to 1300 m.

Notes — 1. This species is very variable with regard to the shape and texture of the lamina, the indumentum on the various parts, and the dimensions of the fig receptacle.

2. Fig receptacles with a diameter of up to 2.5 cm when dry, recorded by Corner (ms.), have not been encountered in material examined for the present treatment.

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FICUS subgenus UROSTIGMA

Ficus L. subg. *Urostigma* (Gasp.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285; Mildbr. & Burret, Bot. Jahrb. Syst. 46 (1912) 174; Sata, J. Jap. Bot. 10 (1934) 347; Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 176 (as '*Urostigmae*'); Corner, Gard. Bull. Singapore 17 (1960) 370. — *Urostigma* Gasp., Giorn. Bot. Ital. 2 (1844) 214; Rendiconti Reale Accad. Sci. Fis 28 (1845) 81; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 343; Miq., London J. Bot. 7 (1847) 525; Verh. Nederl. Inst. Amsterdam 1 (1849) 133; Fl. Ind. Bat. 1, 2 (1859) 332.

Monoecious trees, with aerial adventitious roots, mostly hemi-epiphytic and the secondary system of aerial roots anastomosing and forming root-baskets (around trunks of host-trees), secondarily terrestrial (or primarily so) and then often forming pillar roots, sometimes hemi-epilithic, or rarely climbers. *Leaves* spirally arranged; lamina coriaceous, margin entire; venation scalariform to reticulate to largely parallel to the lateral veins, the basal lateral veins often distinct in length and angle of departure; 1 waxy gland at the base of the midrib beneath; stipules fully amplexicaul. *Figs* in pairs or solitary, mostly axillary, sometimes ramiflorous (to cauliflorous) and then often more than 2 together on spurs (short-shoots); basal bracts usually 2 or 3, verticillate, lateral bracts absent; ostiole circular and mostly closed by 2 or 3 bracts, or slit-shaped to tri-radiate, with the upper ostiolar bracts descending; interfloral bracts usually present and sometimes internal hairs as well; receptacle containing staminate flowers and both long- and short-styled pistillate flowers, with 3–5(–7) free tepals, these red(dish) and usually glabrous; ostiole closed by 2–3(–5) bracts. *Staminate flowers* scattered among the pistillate ones or near the ostiole; tepals 3 or 4 (or 5), free; stamens 1; pistillodes absent. *Ovaries* whitish or reddish; stigma 1, rarely bifid, mostly clearly papillate. *Fruits* ellipsoid, smooth, sometimes ± drupaceous or embedded in the wall of the receptacle.

DISTRIBUTION

The subgenus is pantropical and comprises c. 280 species, of which c. 100 in the Neotropics and c. 80 in Africa. It is represented by 68 indigenous species in Malesia. The main centre for the neotropical section *Americana* is the northern Andean region, secondary centres are found in northern Central America and Mexico, the Guiana region, and eastern Brazil. In Africa, where the *Ficus* flora is dominated by the endemic section *Galoglychia*, it occurs in a wide range of habitats. In Australia, the subgenus is for the greater part represented by subsect. *Malvanthera*, which extends to adjacent parts of Malesia and to the Pacific region. In Malesia the majority of the species belong to subsect. *Conosycea*, which is centred in western Malesia (with a high concentration of species in northern Borneo) and is associated with humid forest. The other Asian subdivision, subsect. *Urostigma*, is largely an element of the mainland flora, partly Indian, partly Sino-Himalayan. The subsection extends to Malesia, often in drier types of vegetation, and westwards to Africa, mainly to regions with savannah woodland.

MORPHOLOGY

Habit — All species develop aerial adventitious roots from the base of the trunk and/or from the branches. Therefore the majority of the species and individuals are hemi-epiphytic (described in detail above, p. 23). The species may also establish on rocky surfaces (or walls) as hemi-epilithic individuals. Light conditions promote establishment in open vegetations (including secondary vegetations and tree plantations). As trees establish close to the soil, they can soon become independent of the host-tree. The species tend to have short trunks and spreading, often flat-topped, crowns.

In exposed places, as sea-shore rocks or hill-tops, species which may grow into large trees, become dwarfed into low carpeting shrubs. *Ficus benjamina*, *F. delosyce*, *F. kerkhovenii*, and *F. microcarpa*, are among the most powerful hemi-epiphytes, often able to overpower host-trees. Some species, *F. acamptophylla*, *F. depressa*, *F. globosa*, *F. microsyce*, and *F. paracamptophylla*, are mostly lianescent with slender stems, using slender aerial roots to all manners of support, sprawling through forest-canopy or festooning forest-edges.

Growth is mostly intermittent, most clearly so in subsect. *Urostigma*, in which sections with short internodes and different colours of branches mark intermittent seasonal growth, mostly accompanied by deciduousness. The period of bare crown may vary from one day (*F. caulocarpa*) to some weeks (*F. religiosa*). The stipules of deciduous species are often much longer than normal, even 10–30 cm long. In some species (of subsect. *Urostigma*), stipules may form terminal buds. Relatively long stipules are characteristic of sect. *Stilpnophyllum*. The majority of the species, in particular those of subsect. *Conosycea* are evergreen and the branches do not show clear features of intermittent growth, at most subpersistent stipules on current growth.

Indumentum — The indumentum consists of uncellular hairs, whitish, yellowish or brown and often also of appressed elongate brown pluricellular hairs, conspicuously present in some species of subsect. *Conosycea* and subsect. *Malvanthera*.

Leaves — The leaves have short and relatively long petioles in most species of sect. *Conosycea* and relatively long and slender ones in subsect. *Urostigma*. Moreover, there often is an articulation at the junction of petiole and lamina in the latter group. The lamina is often broadest below the middle, varying to cordiform, if the petiole is long. The same correlation is found in neotropical and African sections of the subgenus and is associated with occurrence in (relatively) dry habitats. The basal lateral veins mostly differ in length and angle of departure from the other lateral veins. The tertiary venation varies from clearly scalariform to reticulate to largely parallel to the lateral veins. The latter state is pronouncedly present in, e.g. *F. benjamina* and *F. elastica*. The variation in venation is similar in the neotropical and African sections of the subgenus. The leaf margin is nearly always entire. The presence of a single waxy gland at the base of the midrib of the lamina beneath is characteristic for the subgenus.

Figs — The figs are mostly axillary and in pairs. In particular in deciduous species the figs can be found just below the leaves on previous season's growth. The figs are borne on spurs below the branches (ramiflorous) in some Asian species, as *F. superba* and

F. virens. The spurs develops successive crops of figs, often more than two together on the same spur. Such spurs and ramiflory are also found in some species of the neotropical and African sections. In several species of the African section spurs can become peg-like and up to 10 cm long, also developing on the trunk.

The figs are sessile or pedunculate. In some Malesian species the receptacle of sessile figs can be stipitate. The number of basal bracts is 3 in sect. *Urostigma*, mostly 3 or sometimes 2 in sect. *Stilpnophyllum*, and 2 in sect. *Americana* and sect. *Galoglychia*. They are mostly persistent, but often early caducous in sect. *Stilpnophyllum*. Lateral bracts in the receptacle are always absent. The ostiole is circular with 2 or 3 upper, imbricate ostiolar bracts closing the ostiole in sect. *Urostigma*, sect. *Americana*, and subsect. *Stilpnophyllum*. In subsect. *Conosycea*, the upper bracts are often not imbricate. In sect. *Galoglychia* and subsect. *Malvanthera*, the upper ostiolar bracts are descending, making the ostiole slit-shaped or tri-radiate.

Young figs in leaf axils are often enclosed in calyptrate bud-covers, which can become more than 2 cm long. They enclose single figs or in sect. *Galoglychia* pairs.

Flowers — The perianth usually consists of 3 or 4, sometimes 5, or rarely more, free tepals. There is only one stamen and usually only one stigma. The stigmas are distinctly papillate and strongly coherent (creating a substigmatic layer). The number of staminate flowers is relatively small, rarely more than 10% of the total number, often few, in small figs often only one, or occasionally even absent. There is always one stamen of which the anther usually has two thecae, but generally only one in subsect. *Malvanthera*. There is usually only one stigma, which sometimes tends to becoming bifid. The stigmas are distinctly papillate; they strongly cohere with those of adjacent flowers, forming a syn-stigmatic layer.

Fruits — The fruits are smooth, reddish, partly reddish, or whitish. In subsect. *Malvanthera*, they are often partly (to entirely) embedded in the wall of the fig. Deviating characters of fruits are found in sect. *Galoglychia* (see Berg & Wiebes 1992); they show similarities to the dehiscent drupe.

SUBDIVISION

This most speciose subgenus is uniform in features of the leaves, as the position of the waxy glands, as well as in features of the figs, as the constant number and position of the basal bracts and the absence of lateral bracts. The flowers are also rather uniform in the construction of the perianth, the number of stamens, and in the stigma. Deviations occur in the fruits of some subdivisions of the African sect. *Galoglychia* (see Berg & Wiebes 1992) and in the 'monothecal' anthers, 'immersed' fruits, and often bifid and not or hardly papillate stigmata of subsect. *Malvanthera*. The subgenus can be subdivided into 4 sections:

- Section *Urostigma* (c. 90 spp.) ranges from West Africa to the Pacific.
- Section *Americana* (c. 100 spp.) is confined to the Neotropics. It is in its overall variation not essentially different from the Palaeotropical section *Urostigma*. The main differentiating character is the presence of two instead of three basal bracts.

The differences between these two sections and the other two are more pronounced. The structure of the ostiole may indicate that the latter two sections are derived from the same ancestral stock.

– Section *Galoglychia* (72 spp.) is confined to the African region. It is quite distinct in the structure of the ostiole, which is slit-shaped because of the two descending upper ostiolar bracts, and it has always two basal bracts. The morphological and ecological differentiation is wider than in the other sections, and includes, e.g., cauliflory.
– Section *Stilpnophyllum* (c. 20 spp.) in Australia and adjacent parts of the Pacific and Malesia, but with a single species (*F. elastica*) in the Sino-Himalayas.

Subg. *Urostigma*
Sect. *Urostigma*
Subsect. *Urostigma*
Subsect. *Conosycea*
Sect. *Americana*
Sect. *Galoglychia*
Sect. *Stilpnophyllum*
Subsect. *Stilpnophyllum*
Subsect. *Malvanthera*

POLLINATORS

Whereas most other subgenera of *Ficus* have one genus of pollinating fig wasps, and subg. *Sycidium* two, subg. *Urostigma* has 13 genera, of which 7 in sect. *Galoglychia* and one in sect. *Americana*. *Pleistodontes* is the genus associated with sect. *Stilpnophyllum* and *Deilagaon*, *Eupristina* (*Eupristina* and *Parapristina*), *Platyscapa*, and *Waterstoniella* with sect. *Urostigma* (see Wiebes 1994).

References: Berg, C.C. & J.T. Wiebes, African fig trees and fig wasps. Verh. Kon. Ned. Akad. Wet., afd. Natk., 2de reeks, 89 (1992) 1–298. — Wiebes, J.T., The Indo-Australian Agaoninae (pollinators of figs). Verh. Kon. Ned. Akad. Wet., afd. Natk., 2de reeks, 92 (1994) 1–208.

KEY TO THE SUBSECTIONS IN MALESIA

1a. Ostiole tri-radiate or slit-shaped, the upper ostiolar bracts descending . . . . . Subsect. **Malvanthera**
b. Ostiole circular, the upper ostiolar bracts horizontal 2
2a. Stipules connate . . . . . Subsect. **Stilpnophyllum**
b. Stipules free 3
3a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds . . . . . Subsect. **Urostigma**
b. Internodes not conspicuously different in length . . . . . Subsect. **Conosycea**

KEY TO THE SPECIES

1a. Ostiole tri-radiate or slit-shaped, the upper ostiolar bracts descending 2
b. Ostiole circular, the upper ostiolar bracts horizontal 7
2a. Aperture of the ostiole slit-shaped 3
b. Aperture of the ostiole tri-radiate 4
3a. Lateral veins 9–14 pairs; apex of the peduncle ± dilated; fig receptacle 0.4–1 cm diam. when dry . . . . . **69. F. rhizophoriphylla**
b. Lateral veins (12–)15–25(–30) pairs; apex of the peduncle extended into a cupule . . . . . **66. F. glandifera**
4a. Stipules 4–20 cm long; fig receptacle 1–4 cm diam. when dry, mostly ellipsoid . . . . . **67. F. hesperidiiformis**
b. Stipules 1–3 cm long; fig receptacle 0.3–1.2 cm diam. when dry, subglobose 5
5a. Petiole usually 3–6 cm long. — Flores . . . . . **65. F. brachypoda**
b. Petiole 0.5–2.5 cm long 6
6a. Periderm of the twigs flaking off; lamina mostly broadest below the middle. — Lesser Sunda Islands . . . . . **65. F. brachypoda**
b. Periderm of the twigs persistent; lamina broadest in the middle. — Moluccas, New Guinea . . . . . **68. F. obliqua**
7a. Stipules connate, 6–25 cm long . . . . . **64. F. elastica**
b. Stipules free, up to 6 cm long (on opening shoots sometimes longer) 8
8a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 9
b. Internodes not conspicuously different in length 19
9a. Apex of the lamina caudate. — Cultivated, widespread . . . . . **4. F. religiosa**
b. Apex of the lamina acuminate, mostly shortly so 10
10a. Major basal lateral veins up to 1/3–1/2 the length of the lamina; cystoliths on both sides of the lamina (in dried material visible as minute pustules); ovary white. — Widespread . . . . . **5. F. rumphii**
b. Major basal lateral veins 1/10–1/3 the length of the lamina; cystoliths (usually) only beneath; ovaries red(-brown) 11
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b. Lateral veins 7–16 pairs; upper ostiolar bracts glabrous (or sparsely puberulous outside) 12
12a. Stipules (at the apices of leafy twigs) 0.8–1.5 cm long 13
b. Stipules (at the apices of leafy twigs) 0.2–0.8 cm long 15
13a. Epidermis of the petiole (usually) flaking off, at least at the uppermost and/or basal part; peduncle 0.1–0.5 cm long. — Widespread . . . . . **1. F. caulocarpa**
b. Epidermis of the petiole persistent; peduncle 0.7–1.5 cm long or at most 0.1 cm long 14
14a. Peduncle 0.7–1.5 cm long; basal bracts caducous. — Widespread **8. F. superba**
b. Peduncle 0–0.1 cm long; basal bracts persistent. — Widespread . . . **9. F. virens**

15a. Epidermis of petiole usually flaking off, at least at the top of the petiole and/or the base or hairy at the base; waxy gland in dry material in a groove in the base of the midrib; terminal stipules (usually) forming an ovoid (to subglobose) bud; basal bracts caducous, or if persistent, then usually splitting 16
b. Epidermis persistent; waxy gland not in a groove at the base of the midrib; basal bracts caducous or remaining entire 17
16a. Basal bracts persistent and splitting; fig receptacle 0.3–0.5(–0.7) cm diam. when dry; petiole glabrous. — Widespread . . . . . **1. F. caulocarpa**
b. Basal bracts caducous; fig receptacle 0.7–1.2 cm diam. when dry, or if smaller, then the base of the petiole hairy. — Moluccas . . . . . **7. F. subpisocarpa**
17a. Basal lateral veins up to 1/5–1/3 the length of the lamina, mostly departing from the midrib at different distances from the base, their bases running parallel to the midrib. — Philippines, Celebes, Moluccas . . . . . **3. F. prasinicarpa**
b. Basal lateral veins up to 1/10–1/5 the length of the lamina, their bases not running parallel to the midrib 18
18a. Peduncle 0–0.1 cm long; basal bracts persistent. — Widespread . . . **9. F. virens**
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b. Figs sessile 28
20a. Figs sessile with a peduncle-like stipe (the basal bracts at the base of the stipe) 21
b. Figs pedunculate (the basal bracts at the apex of the peduncle) 22
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b. Apex of the peduncle not widened into a rim 25
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25a. Basal bracts (early) caducous 26
b. Basal bracts persistent 27
26a. Basal lateral veins up to 1/10–1/6 the length of the lamina; stipules 1–1.5(–1.7) cm long. — Sumatra, Malay Peninsula, Java, Borneo, Lesser Sunda Islands . . . . . **34. F. glaberrima**
b. Basal lateral veins up to 1/4–1/3(–1/2) the length of the lamina; stipules 0.5–1 (–1.5) cm long. — New Guinea . . . . . **44. F. microcarpa**
27a. Fig receptacle 0.4–0.7(–1) cm diam. when dry, the peduncle 0.7–1.2 cm long, 2 upper ostiolar bracts visible, these imbricate; leafy twigs glabrous or sparsely

and minutely white puberulous. — Borneo, Philippines, Moluccas, New Guinea . . . . . **41. F. lawesii**

b. Fig receptacle 0.8–1.2 cm diam. when dry, the peduncle 0.2–0.7 cm long, 3 upper ostiolar bracts visible, these unequal in size and hardly or not imbricate; leafy twigs with dark brown appressed hairs. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **35. F. globosa**

28a. Lateral and smaller veins (and often also the apex of the midrib) invisible. — Malay Peninsula, Borneo . . . . . **62. F. tristaniifolia**

b. Lateral veins visible, smaller veins varying from clearly visible to ± obscure 29

29a. Tertiary venation parallel to the lateral veins (such as in *F. elastica*); lateral veins departing in wide angles (towards 90°) 30

b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 35

30a. Fig receptacle ellipsoid, ovoid, or cylindrical; petioles and stipules usually 1.5–3 cm long. — Widespread . . . . . **58. F. subcordata**

b. Fig receptacle subglobose, or if distinctly longer than wide, then the petioles and/or stipules usually up to 1.5 cm long 31

31a. Fig receptacle usually 1–1.8 cm diam. when dry; basal bracts 3–8(–10) mm long 32

b. Fig receptacle 0.5–1 cm diam. when dry, or if more than 1 cm diam., then the basal bracts 0.5–3 mm long 33

32a. Basal bracts subequal in size and shape; ostiole closed. — New Guinea . . . . . **13. F. archboldiana**

b. Basal bracts unequal in size and shape; ostiole ± open. — Sumatra, Malay Peninsula, Java, (Philippines) . . . . . **57. F. stricta**

33a. Stipules 1.5–2.5 cm long; ostiole closed; basal bracts mostly ± connate. — Celebes?, New Guinea . . . . . **49. F. patellata**

b. Stipules usually 0.5–1.5 cm long; ostiole ± open; basal bracts free 34

34a. Midrib (at least in the lower part) of the lamina slightly prominent; petiole, stipules and fig receptacle when dry usually blackish. — Sumatra, Malay Peninsula, Java . . . . . **40. F. kurzii**

b. Midrib (at least in the lower part) of the lamina slightly impressed; petiole, stipules and fig receptacle when dry usually pale yellowish. — Widespread . . . . . **16. F. benjamina**

35a. Lamina mostly up to 10 cm, rarely up to 15 cm long 36

b. Lamina mostly longer than 10 cm, up to c. 20 or up to c. 30 cm 60

36a. Fig receptacle longer than wide (ellipsoid, obovoid, ovoid, or cylindrical) . . 37

b. Fig receptacle about as long as wide (subglobose) 42

37a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 38

b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 39

38a. Fig receptacle 1.5–2 cm diam. when dry; basal bracts 5–10 mm long. — Widespread . . . . . **61. F. sundaica**

b. Fig receptacle 0.5–1(–1.2) cm diam. when dry; basal bracts 3–5 mm long. — Borneo . . . . . **18. F. borneensis**

39a. Basal lateral veins up to 1/10–1/4 the length of the lamina 40
b. Basal lateral veins up to 1/4–1/3(–1/2) the length of the lamina 41
40a. Petiole 0.5–1(–1.5) cm long; base of the lamina rounded to obtuse, apex rounded to obtuse to short-acuminate. — Sumatra, Borneo . . . . . **10. F. acamptophylla**
b. Petiole 1.5–2.5(–3) cm long; base of the lamina cuneate to obtuse, apex acuminate. — Sumatra, Malay Peninsula, Borneo, Philippines . . . . . **50. F. pellucidopunctata**
41a. Stipules distinctly hairy; margin of the lamina not callose towards the base; apex of the lamina acuminate. — Sumatra, Malay Peninsula, Borneo **59. F. subgelderi**
b. Stipules glabrous (or sparsely and minutely puberulous); margin of the lamina usually callose towards the base; apex of the lamina rounded to short-acuminate. — Widespread . . . . . **21. F. callophylla**
42a. Indumentum on leafy twigs and stipules brown. — Malay Peninsula . . . . . **20. F. calcicola**
b. Indumentum absent or, if present, then white 43
43a. Lower surface of the lamina ± densely puberulous on the veins. — Malay Peninsula . . . . . **52. F. pubilimba**
b. Lower surface of the lamina glabrous, or if hairy, then minutely so and only on the midrib 44
44a. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 45
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 54
45a. Basal lateral veins branched, 1/3–1/2 the length of the lamina; margin of the lamina not callose towards the base. — Sumatra, Malay Peninsula, Java, Borneo, Philippines . . . . . **51. F. pisocarpa**
b. Basal lateral veins unbranched, mostly up to 1/4 the length of the lamina, or if up to 1/3(–1/2), then the margin of the lamina ± callose towards the base 46
46a. Ostiole (sub)conical 47
b. Ostiole flat, slightly prominent, or slightly sunken 48
47a. Fig receptacle 0.4–0.7 cm diam. when dry; stipules 0.5–1(–1.2) cm long. — Sumatra, Malay Peninsula, Borneo . . . . . **29. F. delosyce**
b. Fig receptacle (0.5–)0.7–1.2 cm diam. when dry; stipules (0.5–)1–1.5(–2) cm long. — Sumatra, Borneo . . . . . **10. F. acamptophylla**
48a. Tertiary and smaller veins of the lamina obscure beneath; stipules 0.5–1 cm long; fig receptacle 0.3–0.4 cm diam. when dry. — Sumatra, Malay Peninsula . . . . . **45. F. microsyce**
b. Tertiary and smaller veins of the lamina distinct; stipules mostly 1–2 cm long, or if 0.5–1 cm long, then the fig receptacle 0.5–0.8(–1) cm diam. when dry . . . 49
49a. Basal bracts 3–8(–10) mm long; fig receptacle 0.7–1.3(–1.8) cm diam. when dry 50
b. Basal bracts 1–3 mm long; fig receptacle 0.3–0.6(–0.8) cm diam. when dry, basal lateral veins up to 1/4–1/2 the length of the lamina, and/or petioles, stipules, and basal bracts usually glabrous 51
50a. Basal lateral veins up to 1/10–1/4 the length of the lamina; petioles, stipules, and basal bracts minutely white puberulous; margin of the lamina not callose towards the base. — Sumatra, Borneo . . . . . **10. F. acamptophylla**

b. Basal lateral veins up to 1/4–1/3(–1/2) the length of the lamina; petioles, stipules, and basal bracts usually glabrous; margin of the lamina ± callose towards the base. — Widespread . . . . . **21. F. callophylla**

51a. Petioles and stipules usually 0.5–1 cm long; basal lateral veins usually 1/4–1/2 the length of the lamina 52

b. Petioles and stipules usually 1–2 cm long; basal lateral veins usually 1/10–1/4, sometimes in *F. rigo* up to 1/3, the length of the lamina 53

52a. Basal bracts 2–3 mm long; apex of the lamina short-acuminate (with an obtuse acumen) to obtuse to subacute to rounded. — Widespread . . **44. F. microcarpa**

b. Basal bracts 1.5–2 mm long; apex of the lamina usually acuminate to subcaudate. — Sumatra, Malay Peninsula, Borneo . . . . . **47. F. pallescens**

53a. Basal bracts 1–2 mm long; apex of the lamina acuminate. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **17. F binnendijkii**

b. Basal bracts 2–3 mm long; apex of the lamina rounded to obtuse. — New Guinea . . . . . **54. F. rigo**

54a. Indumentum of leafy twigs, petioles, and stipules (usually) brownish; basal bracts c. 2 mm long. — Borneo . . . . . **55. F. soepadmoi**

b. Indumentum of leafy twigs, petioles, and stipules absent or whitish, or if brownish, then the basal bracts 3–5(–10) mm long 55

55a. Stipules and/or petioles usually 0.5–1 cm long; apex of the lamina rounded to obtuse or to subacute to short-acuminate, the acumen obtuse; basal bracts 0.5–4 mm long 56

b. Stipules and petioles usually 1–1.5 cm long, or up to 3 or 4 cm long, resp.; apex of the lamina acuminate, or if rounded to obtuse and basal bracts 2–3 mm long, then only occurring in New Guinea or the basal bracts 4–8(–10) mm long . . 58

56a. Tertiary venation (nearly) invisible. — Malay Peninsula, Borneo . . . . . **56. F. spathulifolia**

b. Tertiary venation visible 57

57a. Fig receptacle with internal hairs; midrib of the lamina flat to slightly prominent or impressed above; acumen of the lamina obtuse. — Widespread . . . . . **44. F. microcarpa**

b. Fig receptacle without internal hairs; midrib of the lamina impressed above; acumen of the lamina usually acute. — Sumatra, Malay Peninsula, Java, Borneo, Philippines, Celebes? . . . . . **60. F. sumatrana**

58a. Basal bracts 2–3 mm long. — New Guinea . . . . . **54. F. rigo**

b. Basal bracts 3–8(–10) mm long 59

59a. Apex of the lamina acuminate, the acumen usually acute; margin of the lamina not callose. — Sumatra, Malay Peninsula, Java, Borneo, Philippines, Celebes? . . . . . **60. F. sumatrana**

b. Apex of the lamina rounded to short-acuminate, the acumen usually obtuse; margin of the lamina ± callose towards the base. — Widespread **21. F. callophylla**

60a. Fig receptacle longer than wide 61

b. Fig receptacle about as long as wide (or wider than high) 84

61a. Fig receptacle 2–3.5 cm diam. when dry 62

b. Fig receptacle 0.3–2 cm diam. when dry 67

62a. Apex of lamina rounded; basal lateral veins mostly up to 1/3–1/2 the length of the lamina. — Sumatra, Malay Peninsula, Borneo . . . . . **63. F. xylophylla**
b. Apex of lamina acuminate (to obtuse); basal lateral veins mostly 1/8–1/3 the length of the lamina 63
63a. Stipules 1–1.5(–2) cm long; (main) basal lateral veins often branched, often 1–3 pairs of smaller lateral veins below the main ones; base of the lamina cordate to rounded; basal lateral veins 0.5–4 mm long 64
b. Stipules (1.5–)2–4 cm long; basal lateral veins unbranched, usually without smaller lateral veins below the (main) ones; base of the lamina rounded to cuneate, or cordate, then the basal bracts 10–20(–30) mm long 65
64a. Stipules brownish (woolly) tomentose to subvillous or glabrous; fig receptacle glabrous inside. — Widespread . . . . . **31. F. drupacea**
b. Stipules sparsely to densely yellowish sericeous; fig receptacle hairy inside, on the inner surface or also on the pedicels. — Philippines, Celebes . **24. F. cordatula**
65a. Lateral veins (8–)12–20 pairs; basal lateral veins up to 1/20–1/10 the length of the lamina. — Widespread . . . . . **12. F. annulata**
b. Lateral veins 8–12 pairs; basal lateral veins up to 1/8–1/3(–1/2) the length of the lamina 66
66a. Basal bracts 8–10 mm long, ovate to elliptic, the apex obtuse; tertiary venation partly parallel to the lateral veins. — Sumatra . . . . . **37. F. juglandiformis**
b. Basal bracts 10–20(–30) mm long, semicircular to suborbicular, the apex rounded. — Java, Borneo . . . . . **26b. F. crassiramea** subsp. **stupenda**
67a. Fig receptacle 1–2 cm diam. when dry 68
b. Fig receptacle 0.3–1 cm diam. when dry 79
68a. Indumentum (partly) set(ul)ose with irritating hairs . . . . . **27. F. cucurbitina**
b. Indumentum not set(ul)ose 69
69a. Basal bracts 0.5–3 mm long 70
b. Basal bracts 3–18 mm long 72
70a. Stipules 1–1.5(–2) cm long; base of the lamina cordate to rounded. — Widespread . . . . . **31. F. drupacea**
b. Stipules 2–4 cm long; base of the lamina rounded or to subattenuate 71
71a. Basal lateral veins curved, usually running close to the margin, unbranched; ostiole closed, the 3 upper ostiolar bracts clearly imbricate. — Malay Peninsula . . . . . **42. F. lowii**
b. Basal lateral veins straight or slightly curved, branched; ostiole ± open, the 3 upper ostiolar bracts not or slightly imbricate. — Widespread . . . . . **11. F. altissima**
72a. Petiole 0.5–1(–1.5) cm long, 1–2 mm thick 73
b. Petiole 1.5–5.5 cm long, 2–3(–5) mm thick 74
73a. Basal bracts 3–5 mm long; fig receptacle 0.5–1.2 cm diam. when dry. — Sumatra, Borneo . . . . . **10. F. acamptophylla**
b. Basal bracts 5–8 mm long; fig receptacle 1.5–2 cm diam. when dry . . . . . **61. F. sundaica**
74a. Ostiole ± open, the 3 upper ostiolar bracts not or slightly imbricate; lateral veins 5 or 6 (or 7) pairs; stipules yellowish to whitish sericeous to puberulous. — Sumatra, Malay Peninsula . . . . . **59. F. subgelderi**

b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate; lateral veins 7–12 pairs, or if less, then the stipules glabrous or minutely white puberulous 75

75a. Basal bracts 10–18 mm long, covering 1/2–3/4 the length of the receptacle 76

b. Basal bracts usually 4–10 cm long, covering up 1/3(–1/2) the length of the lamina 77

76a. Apex of lamina acuminate, the acumen acute; basal bracts broadest below the middle, the apex often obtuse. — Java . . . . . **36. F. involucrata**

b. Apex of lamina short-acuminate, the acumen obtuse; basal bracts broadest above the middle, the apex rounded. — Celebes, Moluccas, New Guinea . . . . . **26a. F. crassiramea** subsp. **crassiramea**

77a. Midrib (and lateral veins) ± impressed above; stipules brownish to whitish sericeous to puberulous; base of lamina mostly (sub)cordate with a narrow sinus. — Malay Peninsula, Borneo, Philippines . . . . . **33. F. forstenii**

b. Midrib (and lateral veins) slightly prominent to flat or the midrib sometimes slightly impressed; stipules glabrous or white (minutely) puberulous; base of lamina mostly cuneate to rounded 78

78a. Apex of lamina acuminate, the acumen acute; basal bracts broadest below the middle, the apex often obtuse; areoles of lamina obscure beneath. — Widespread . . . . . **61. F. sundaica**

b. Apex of lamina short-acuminate, the acumen obtuse; basal bracts broadest above the middle, the apex rounded; areoles of lamina usually distinct beneath because of prominent veinlets. — Celebes, Moluccas, New Guinea . . . . . **26a. F. crassiramea** subsp. **crassiramea**

79a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 80

b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 81

80a. Basal bracts semicircular to suborbicular, imbricate, the apex rounded; areoles of lamina usually distinct beneath because of prominent veinlets. — Eastern Malesia . . . . . **26a. F. crassiramea** subsp. **crassiramea**

b. Basal bracts ovate, not (or only basally) imbricate, the apex obtuse; areoles of lamina obscure beneath. — Widespread . . . . . **61. F. sundaica**

81a. Basal lateral veins branched; lateral veins (3–)4–6 pairs. — Sumatra, Malay Peninsula, Java, Borneo, Philippines . . . . . **51. F. pisocarpa**

b. Basal lateral veins (usually) unbranched; lateral veins 6–12 pairs 82

82a. Basal lateral veins 1/4–1/3(–1/2) the length of the lamina; apex of lamina rounded to short-acuminate, the acumen obtuse; leafy twigs, petioles and stipules usually glabrous. — Philippines . . . . . **21. F. callophylla**

b. Basal lateral veins up to 1/10–1/4 the length of the lamina; apex of lamina acuminate, or if short-acuminate to rounded, then the leafy twigs, petioles and stipules puberulous 83

83a. Fig receptacle ellipsoid. — Sumatra, Malay Peninsula, Borneo, Philippines . . . . . **50. F. pellucidopunctata**

b. Fig receptacle ovoid. — Sumatra, Borneo . . . . . **10. F. acamptophylla**

84a. Fig receptacle 1–2 cm diam. when dry 85

b. Fig receptacle 0.3–1 cm diam. when dry 96

85a. Indumentum on various parts (as leafy twigs and midrib of the lamina beneath) brown floccose-tomentose 86
b. Indumentum not floccose-tomentose 87
86a. Apex of the fig receptacle concave, the ostiole sunken; stipules 2–6 cm long, subpersistent. — Sumatra, Malay Peninsula . . . . . **19. F. bracteata**
b. Apex of the fig receptacle convex to submammillate, the ostiole ± prominent; stipules 1–2 cm long, mostly caducous. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **23. F. consociata**
87a. Basal bracts 0.5–3 mm long 88
b. Basal bracts (3–)4–10(–18) mm long 90
88a. Midrib impressed above; areoles of the lamina conspicuous beneath. — Malay Peninsula . . . . . **42. F. lowii**
b. Midrib slightly prominent to flat (or slightly impressed towards the base); areoles of the lamina obscure 89
89a. Apex of lamina acuminate; petiole 2–5 cm long. — Borneo . . . . **25. F. corneri**
b. Apex of lamina rounded (to obtuse); petiole (0.5–)1–2(–3) cm long. — Sumatra?, Malay Peninsula . . . . . **28. F. curtipes**
90a. Lamina on the midrib above and the midrib and lateral veins beneath white puberulous; base of the lamina cordate to rounded. — Cultivated . . . . . **15. F. benghalensis**
b. Lamina above and beneath glabrous or sometimes minutely puberulous on the midrib beneath; base of the lamina cuneate to rounded 91
91a. Midrib (at least the lower part) impressed above; base of lamina cordate to rounded. — Borneo . . . . . **48. F. paracamptophylla**
b. Midrib of lamina slightly prominent to flat; base of lamina usually cuneate to rounded 92
92a. Basal bracts semicircular to suborbicular with a rounded apex, imbricate, covering 1/3–2/3 of the receptacle. — Widespread . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Basal bracts (broadly) ovate, not (or only basally) imbricate with an obtuse to acute or to rounded apex, covering up to 1/3 (or 1/2) of the receptacle 93
93a. Apex of the lamina acuminate, usually with an acute acumen; basal bracts ovate, not or only imbricate at the base. — Widespread . . . . . **61. F. sundaica**
b. Apex of the lamina rounded to obtuse, or if acuminate, then with an obtuse acumen; basal bracts semicircular to broadly ovate, ± imbricate 94
94a. Base of the lamina and the lower part of the margin not (or hardly) callose; smaller veins of the lamina, even the reticulum ± clearly visible beneath; basal bracts usually covering 1/2 or more of the fig receptacle. — Widespread . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Base of the lamina and (at least) the lower part of the margin ± distinctly callose; smaller veins of the lamina usually not clearly visible to obscure; basal bracts covering up to 1/2 of the fig receptacle 95
95a. Lateral veins 6–10 pairs; apex of the lamina (usually) short-acuminate. — Widespread . . . . . **21. F. callophylla**
b. Lateral veins 10–13 pairs; apex of the lamina (usually) rounded. — Sumatra?, Malay Peninsula . . . . . **28. F. curtipes**

96a. Basal bracts 0.5–2.5(–3) mm long 97
b. Basal bracts 3–8(–10) mm long 101
97a. Ostiole open, the 3 upper ostiolar bracts not or slightly imbricate 98
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 100
98a. Lamina ± densely puberulous on the veins beneath. — Malay Peninsula . . . . . **52. F. pubilimba**
b. Lamina glabrous beneath 99
99a. Stipules glabrous. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **17. F. binnendijkii**
b. Stipules yellowish sericeous. — Malay Peninsula . . . . . **43. F. maclellandii**
100a. Basal lateral veins up to 1/20–1/10 the length of the lamina; apex of the lamina short-acuminate. — Sumatra, Malay Peninsula, Java, Borneo, Philippines . . . . . **38. F. kerkhovenii**
b. Basal lateral veins up to usually 1/4–1/3 the length of the lamina; apex of the lamina usually rounded. — Sumatra?, Malay Peninsula . . . . . **28. F. curtipes**
101a. Indumentum on various parts (as stipules and midrib of the lamina beneath) brown floccose-tomentose. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **23. F. consociata**
b. Indumentum not floccose-tomentose 102
102a. Leafy twigs (and often also on other parts) with abundant small dark brown appressed hairs; tertiary venation ± prominent beneath 103
b. Leafy twigs without such hairs or if present, then very sparse and inconspicuous; tertiary venation (almost) flat beneath 104
103a. Petiole 0.5–1 cm long; apex of the lamina rounded; tertiary venation of the lamina slightly prominent (rather inconspicuous). — Java, Borneo (southern) . . . . . **53. F. retusa**
b. Petiole (0.5–)1–2.5 cm long; apex of the lamina acuminate to rounded; tertiary venation prominent (and conspicuous). — Sumatra, Malay Peninsula, Borneo . . . . . **39. F. kochummeniana**
104a. Ostiole ± open, the upper 3 ostiolar bracts not or partly imbricate 105
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 108
105a. Basal lateral veins up to 1/10–1/4 the length of the lamina 106
b. Basal lateral veins up to 1/4–1/2 the length of the lamina 107
106a. Fig receptacle 0.3–0.6 cm diam. when dry; basal bracts 1–2 mm long. — Sumatra, Malay Peninsula, Java, Borneo . . . . . **17. F. binnendijkii**
b. Fig receptacle (0.5–)0.7–1.2 cm diam. when dry; basal bracts 3–5 mm long. — Sumatra, Borneo . . . . . **10. F. acamptophylla**
107a. Lateral veins 6–10 pairs, the basal pair unbranched, sometimes faintly branched. — Widespread . . . . . **21. F. callophylla**
b. Lateral veins (3–)4–6 pairs, the basal pair branched. — Widespread . . . . . **51. F. pisocarpa**
108a. Lateral veins 10–13 pairs. — Sumatra?, Malay Peninsula . . . . **28. F. curtipes**
b. Lateral veins (3–)4–8(–9) pairs 109
109a. Basal bracts 3–5 mm long; apex of the lamina rounded. — Java, Borneo (southern) . . . . . **53. F. retusa**
b. Basal bracts 5–8 mm long; apex of the lamina acuminate 110

110a. Base of lamina auriculate to cordulate; fig receptacle depressed-globose. — Java . . . . . **46. F. miqueliana**
b. Base of lamina cuneate to rounded; fig receptacle subglobose to ovoid to ellipsoid to obovoid. — Widespread . . . . . **61. F. sundaica**

Note for all regional keys — It is not certain whether the commonly cultivated species, *F. benghalensis*, *F. elastica*, and *F. religiosa* occur in all the subdivisions, but to be on the safe side they are included in all regional keys.

REGIONAL KEY: MALAY PENINSULA

1a. Stipules connate, 6–25 cm long . . . . . **64. F. elastica**
b. Stipules free, usually less than 6 cm long, on opening shoots, in some species up to 8 cm long 2
2a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 3
b. Internodes not conspicuously different in length 10
3a. Apex of the lamina caudate . . . . . **4. F. religiosa**
b. Apex of the lamina acuminate, mostly shortly so 4
4a. Major basal lateral veins up to 1/3–1/2 the length of the lamina; cystoliths on both sides of the lamina (in dried material visible as minute pustules); ovary white . . . . . **5. F. rumphii**
b. Major basal lateral veins 1/10–1/3 the length of the lamina; cystoliths (usually) only beneath; ovaries red(-brown) 5
5a. Lateral veins 4–7 pairs; margin of upper ostiolar bracts ciliolate **6. F. saxophila**
b. Lateral veins 7–16 pairs; upper ostiolar bracts glabrous (or sparsely puberulous outside) 6
6a. Petiole hairy, at least at the base . . . . . **7. F. subpisocarpa**
b Petiole glabrous 7
7a. Epidermis of the petiole (usually) flaking off, at least at the uppermost and/or basal part . . . . . **1. F. caulocarpa**
b. Epidermis of the petiole persistent 8
8a. Stipules at the apices of leafy twigs subpersistent and forming ovoid buds (the scars of the stipules concentrated at the base of the new season's growth); peduncle 0.7–1.5 cm long . . . . . **8. F. superba**
b. Stipules not forming distinct terminal buds; figs sessile or up to 0.5 cm long pedunculate 9
9a. Peduncle 0–0.1 cm long; basal bracts persistent . . . . . **9. F. virens**
b. Peduncle 0.1–0.3(–0.5) cm long; basal bracts caducous . . . . . **2. F. concinna**
10a. Figs pedunculate or sessile with a peduncle-like stipe 11
b. Figs sessile 15
11a. Figs sessile with a peduncle-like stipe (the basal bracts at the base of the stipe) . . . . . **32. F. dubia**
b. Figs pedunculate (the basal bracts at the apex of the peduncle) 12

12a. Apex of the peduncle widened into a rim (bearing the basal bracts inside) . . 13
b. Apex of the peduncle not widened into a rim 14
13a. Midrib of the lamina beneath laterally hairy, often with hairs concentrated in the axils of the lateral veins . . . . . **30. F. depressa**
b. Midrib of the lamina beneath with hairs evenly distributed or absent . . . . . **12. F. annulata**
14a. Basal bracts (early) caducous; fig receptacle subglobose, 0.5–0.7 cm diam. when dry . . . . . **34. F. glaberrima**
b. Basal bracts persistent; fig receptacle ellipsoid to subglobose, 0.8–1.2 cm diam. when dry . . . . . **35. F. globosa**
15a. Lateral and smaller veins (and often also the apex of the midrib) invisible . . . . . **62. F. tristaniifolia**
b. Lateral veins visible, smaller veins varying from clearly visible to ± obscure 16
16a. Tertiary venation parallel to the lateral veins (such as in *F. elastica*); lateral veins departing in wide angles (towards 90°); margin often callose towards the base 17
b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 20
17a. Fig receptacle ellipsoid, ovoid, or cylindrical; petioles and stipules usually 1.5–3 cm long . . . . . **58. F. subcordata**
b. Fig receptacle subglobose, or if distinctly longer than wide, then the petioles and/or stipules usually up to 1.5 cm long 18
18a. Fig receptacle usually 1–1.8 cm diam. when dry; basal bracts 3–8(–10) mm long . . . . . **57. F. stricta**
b. Fig receptacle 0.5–1 cm diam., or if more than 1 cm diam. when dry, then the basal bracts 0.5–3 mm long 19
19a. Midrib (at least in the lower part) of the lamina slightly prominent; petiole, stipules and fig receptacle when dry usually blackish . . . . . **40. F. kurzii**
b. Midrib (at least in the lower part) of the lamina slightly impressed; petiole, stipules and fig receptacle usually pale yellowish . . . . . **16. F. benjamina**
20a. Lamina mostly up to 10 cm, rarely up to 15 cm long 21
b. Lamina mostly longer than 10 cm, up to c. 20 or up to c. 30 cm 38
21a. Fig receptacle longer than wide (ellipsoid, obovoid, ovoid, or cylindrical) . . 22
b. Fig receptacle about as long as wide (subglobose) 25
22a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate . . . **61. F. sundaica**
b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 23
23a. Basal lateral veins up to 1/10–1/4 the length of the lamina . . . . . **50. F. pellucidopunctata**
b. Basal lateral veins up to 1/4–1/3(–1/2) the length of the lamina 24
24a. Stipules distinctly hairy; margin of the lamina not callose towards the base; apex of the lamina acuminate . . . . . **59. F. subgelderi**
b. Stipules glabrous (or sparsely and minutely puberulous); margin of the lamina usually callose towards the base; apex of the lamina rounded to short-acuminate . . . . . **21. F. callophylla**

25a. Indumentum on leafy twigs and stipules brown . . . . . **20. F. calcicola**
b. Indumentum absent or, if present, then white 26
26a. Lower surface of the lamina ± densely puberulous on the veins . . . . . **52. F. pubilimba**
b. Lower surface of the lamina glabrous, or if hairy, then minutely so and only on the midrib 27
27a. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 28
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 34
28a. Basal lateral veins branched, 1/3–1/2 the length of the lamina; margin of the lamina not callose towards the base . . . . . **51. F. pisocarpa**
b. Basal lateral veins unbranched, mostly up to 1/4 the length of the lamina, or if up to 1/3(–1/2), then the margin of the lamina ± callose towards the base 29
29a. Ostiole (sub)conical . . . . . **29. F. delosyce**
b. Ostiole flat, slightly prominent, or slightly sunken 30
30a. Tertiary and smaller veins of the lamina obscure beneath; stipules 0.5–1 cm long; fig receptacle 0.3–0.4 cm diam. when dry . . . . . **45. F. microsyce**
b. Tertiary and smaller veins of the lamina distinct; stipules mostly 1–2 cm long, or if 0.5–1 cm long, then the fig receptacle 0.5–0.8(–1) cm diam. when dry . . . 31
31a. Basal bracts 3–8(–10) mm long; fig receptacle 0.7–1.3(–1.8) cm diam. when dry . . . . . **21. F. callophylla**
b. Basal bracts 1–3 mm long; fig receptacle 0.3–0.6(–0.8) cm diam. when dry, basal lateral veins up to 1/4–1/2 the length of the lamina, and/or petioles, stipules, and basal bracts usually glabrous 32
32a. Petioles or stipules usually 1–2 cm long; basal lateral veins usually 1/10–1/4 the length of the lamina . . . . . **17. F binnendijkii**
b. Petioles and stipules usually 0.5–1 cm long; basal lateral veins usually 1/4–1/2 the length of the lamina 33
33a. Basal bracts 2–3 mm long; apex of the lamina short-acuminate (with an obtuse acumen) to obtuse to subacute to rounded . . . . . **44. F. microcarpa**
b. Basal bracts 1.5–2 mm long; apex of the lamina usually acuminate to subcaudate . . . . . **47. F. pallescens**
34a. Stipules and/or petioles usually 0.5–1 cm long; apex of the lamina rounded to obtuse or to subacute to short-acuminate (with obtuse acumen); basal bracts 0.5–4 mm long 35
b. Stipules and petioles usually 1–1.5 cm long, or up to 3 or 4 cm long, respectively; apex of the lamina acuminate, or if rounded to obtuse, then the basal bracts 4–8(–10) mm long 37
35a. Tertiary venation (nearly) invisible . . . . . **56. F. spathulifolia**
b. Tertiary venation visible 36
36a. Fig receptacle with internal hairs; midrib of the lamina flat to slightly prominent or impressed above; acumen of the lamina obtuse; basal bracts 2–3 mm long . . . . . **44. F. microcarpa**
b. Fig receptacle without internal hairs; midrib of the lamina impressed above; acumen of the lamina usually acute; basal bracts 3–8(–10) mm long . . . . . **60. F. sumatrana**

37a. Apex of the lamina acuminate, the acumen usually acute; margin of the lamina not callose . . . . . **60. F. sumatrana**
b. Apex of the lamina rounded to short-acuminate, the acumen usually obtuse; margin of the lamina ± callose towards the base . . . . . **21. F. callophylla**
38a. Fig receptacle longer than wide 39
b. Fig receptacle about as long as wide (or wider than high) 54
39a. Fig receptacle 2–3 cm diam. when dry 40
b. Fig receptacle 0.3–2 cm diam. when dry 42
40a. Basal lateral veins (1/4–)1/3–1/2 the length of the lamina; tertiary venation of the lamina reticulate to subscalariform . . . . . **63. F. xylophylla**
b. Basal lateral veins up to 1/4 the length of the lamina, or if up to 1/3, then the tertiary venation of the lamina partly parallel to the lateral veins (towards the midrib) 41
41a. Stipules 1–1.5(–2) cm long; (main) basal lateral veins often branched, often 1–3 pairs of smaller lateral veins below the main ones; base of the lamina cordate to rounded . . . . . **31. F. drupacea**
b. Stipules (1.5–)2–4 cm long; basal lateral veins unbranched, usually without smaller lateral veins below the (main) ones; base of the lamina rounded to cuneate (rarely subcordate) . . . . . **12. F. annulata**
42a. Fig receptacle 1–2 cm diam. when dry 43
b. Fig receptacle 0.3–1 cm diam. when dry 50
43a. Indumentum (partly) set(ul)ose with irritating hairs . . . . . **27. F. cucurbitina**
b. Indumentum not set(ul)ose 44
44a. Basal bracts 0.5–3 mm long 45
b. Basal bracts 3–12 mm long 47
45a. Stipules 1–1.5(–2) cm long; base of the lamina cordate to rounded . . . . . **31. F. drupacea**
b. Stipules 2–4 cm long; base of the lamina rounded or to subattenuate 46
46a. Basal lateral veins curved, usually running close to the margin, unbranched; ostiole closed, the 3 upper ostiolar bracts clearly imbricate . . . . . **42. F. lowii**
b. Basal lateral veins straight or slightly curved, branched; ostiole ± open, the 3 upper ostiolar bracts not or slightly imbricate . . . . . **11. F. altissima**
47a. Petiole 0.5–1(–1.5) cm long, 1–2 mm thick . . . . . **61. F. sundaica**
b. Petiole 1–5.5 cm long, 2–3(–5) mm thick 48
48a. Ostiole ± open, the 3 upper ostiolar bracts not or slightly imbricate . . . . . **59. F. subgelderi**
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 49
49a. Base of the lamina rounded to cordate (with a narrow sinus); lamina puberulous on the venation beneath and on the midrib above . . . . . **33. F. forstenii**
b. Base of the lamina cuneate to rounded; lamina glabrous . . . . . **61. F. sundaica**
50a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 51
b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 52
51a. Basal bracts semicircular to suborbicular, imbricate, the apex rounded; areoles of lamina usually distinct beneath because of prominent veinlets . . . . . **26a. F. crassiramea** subsp. **crassiramea**

b. Basal bracts ovate, not (or only basally) imbricate, the apex obtuse; areoles of lamina obscure beneath . . . . . **61. F. sundaica**
52a. Basal lateral veins branched; lateral veins (3–)4–6 pairs . . . . **51. F. pisocarpa**
b. Basal lateral veins (usually) unbranched; lateral veins 6–12 pairs 53
53a. Fig receptacle ellipsoid; petiole usually 1–2 cm long **50. F. pellucidopunctata**
b. Fig receptacle ovoid; petiole usually 0.5–1 cm long . . . **10. F. acamptophylla**
54a. Fig receptacle 1–2 cm diam. when dry 55
b. Fig receptacle 0.3–1 cm diam. when dry 64
55a. Indumentum on various parts (as leafy twigs and midrib of the lamina beneath) brown floccose-tomentose 56
b. Indumentum not floccose-tomentose 57
56a. Apex of the fig receptacle concave, the ostiole sunken; stipules 2–6 cm long, subpersistent . . . . . **19. F. bracteata**
b. Apex of the fig receptacle convex to submammillate, the ostiole ± prominent; stipules 1–2 cm long, mostly caducous . . . . . **23. F. consociata**
57a. Midrib impressed above; areoles of the lamina conspicuous beneath **42. F. lowii**
b. Midrib slightly prominent to flat (or slightly impressed towards the base; areoles of the lamina obscure 58
58a. Basal bracts 0.5–3 mm long . . . . . **28. F. curtipes**
b. Basal bracts (3–)4–10(–18) mm long 59
59a. Lamina on the midrib above and the midrib and lateral veins beneath white puberulous; base of the lamina cordate to rounded . . . . . **15. F. benghalensis**
b. Lamina above and beneath glabrous or sometimes minutely puberulous on the midrib beneath; base of the lamina cuneate to rounded 60
60a. Basal bracts semicircular to suborbicular with a rounded apex, imbricate, covering 1/3–2/3 of the receptacle . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Basal bracts (broadly) ovate, not (or only basally) imbricate, with an obtuse to acute or to rounded apex, covering up to 1/3 (or 1/2) of the receptacle 61
61a. Apex of the lamina acuminate, usually with an acute acumen; basal bracts ovate, not or only imbricate at the base . . . . . **61. F. sundaica**
b. Apex of the lamina rounded to obtuse, or if acuminate, then with an obtuse acumen; basal bracts semicircular to broadly ovate, ± imbricate 62
62a. Base of the lamina and the lower part of the margin not (or hardly) callose; smaller veins of the lamina, even the reticulum ± clearly visible beneath; basal bracts usually covering 1/2 or more of the fig receptacle . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Base of the lamina and (at least) the lower part of the margin ± distinctly callose; smaller veins of the lamina usually not clearly visible to obscure; basal bracts covering up to 1/2 of the fig receptacle 63
63a. Lateral veins 6–10 pairs; apex of the lamina (usually) short-acuminate . . . . . **21. F. callophylla**
b. Lateral veins 10–13 pairs; apex of the lamina (usually) rounded **28. F. curtipes**
64a. Basal bracts 0.5–2.5 mm long 65
b. Basal bracts 3–8(–10) mm long 69
65a. Ostiole open, the 3 upper ostiolar bracts not or slightly imbricate 66

b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 68
66a. Lamina ± densely puberulous on the veins beneath . . . . . **52. F. pubilimba**
b. Lamina glabrous beneath 67
67a. Stipules glabrous . . . . . **17. F. binnendijkii**
b. Stipules yellowish sericeous . . . . . **43. F. maclellandii**
68a. Basal lateral veins up to 1/20–1/10 the length of the lamina; apex of the lamina short-acuminate . . . . . **38. F. kerkhovenii**
b. Basal lateral veins up to usually 1/4–1/3 the length of the lamina; apex of the lamina usually rounded . . . . . **28. F. curtipes**
69a. Indumentum on various parts (as stipules and midrib of the lamina beneath) brown floccose-tomentose . . . . . **23. F. consociata**
b. Indumentum not floccose-tomentose 70
70a. Leafy twigs (and often also on other parts) with abundant small dark brown appressed hairs; tertiary venation ± prominent beneath . . **39. F. kochummeniana**
b. Leafy twigs without such hairs or if present, then very sparse and inconspicuous; tertiary venation (almost) flat beneath 71
71a. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 72
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 74
72a. Basal lateral veins up to 1/10–1/4 the length of the lamina . **17. F. binnendijkii**
b. Basal lateral veins up to 1/4–1/2 the length of the lamina 73
73a. Lateral veins of the lamina 6–10 pairs; basal lateral veins unbranched, sometimes faintly branched . . . . . **21. F. callophylla**
b. Lateral veins of the lamina (3–)4–6 pairs; basal lateral veins branched . . . . . **51. F. pisocarpa**
74a. Lateral veins 10–13 pairs . . . . . **28. F. curtipes**
b. Lateral veins (3–)4–8(–9) pairs . . . . . **61. F. sundaica**

REGIONAL KEY: SUMATRA

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b. Stipules free, usually less than 6 cm long, on opening shoots, in some species up to 8 cm long 2
2a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 3
b. Internodes not conspicuously different in length 5
3a. Apex of the lamina caudate . . . . . **4. F. religiosa**
b. Apex of the lamina acuminate, mostly shortly so 4
4a. Epidermis of petiole usually flaking off, at the apex or also at the base; peduncle 0.1–0.5 cm long . . . . . **1. F. caulocarpa**
b. Epidermis of petiole persistent; peduncle 0–0.1 cm long . . . . . **9. F. virens**
5a. Figs pedunculate or sessile with a peduncle-like stipe 6
b. Figs sessile 10
6a. Figs sessile with a peduncle-like stipe (the basal bracts at the base of the stipe) . . . . . **32. F. dubia**

b. Figs pedunculate (the basal bracts at the apex of the peduncle) 7
7a. Apex of the peduncle widened into a rim (bearing the basal bracts inside) . . . 8
b. Apex of the peduncle not widened into a rim 9
8a. Midrib of the lamina beneath laterally hairy, often with hairs concentrated in the axils of the lateral veins . . . . . **30. F. depressa**
b. Midrib of the lamina beneath with hairs evenly distributed or absent . . . . . **12. F. annulata**
9a. Basal bracts (early) caducous; fig receptacle subglobose, 0.5–0.7 cm diam. when dry . . . . . **34. F. glaberrima**
b. Basal bracts persistent; fig receptacle ellipsoid to subglobose, 0.8–1.2 cm diam. when dry . . . . . **35. F. globosa**
10a. Tertiary venation parallel to the lateral veins (such as in *F. elastica*); lateral veins departing in wide angles (towards 90°) 11
b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 14
11a. Fig receptacle ellipsoid, ovoid, or cylindrical; petioles and stipules usually 1.5–3 cm long . . . . . **58. F. subcordata**
b. Fig receptacle subglobose, or if distinctly longer than wide, then the petioles and/or stipules usually up to 1.5 cm long 12
12a. Fig receptacle usually 1–1.8 cm diam. when dry; basal bracts 3–8(–10) mm long . . . . . **57. F. stricta**
b. Fig receptacle 0.5–1 cm diam. when dry, or if more than 1 cm diam., then the basal bracts 0.5–3 mm long 13
13a. Midrib (at least in the lower part) of the lamina slightly prominent; petiole, stipules and fig receptacle when dry usually blackish . . . . . **40. F. kurzii**
b. Midrib (at least in the lower part) of the lamina slightly impressed; petiole, stipules and fig receptacle usually pale yellowish . . . . . **16. F. benjamina**
14a. Lamina mostly up to 10 cm, rarely up to 15 cm long 15
b. Lamina mostly longer than 10 cm, up to c. 20 or up to c. 30 cm 33
15a. Fig receptacle longer than wide (ellipsoid, obovoid, ovoid, or cylindrical) . . 16
b. Fig receptacle about as long as wide (subglobose) 20
16a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate . . . **61. F. sundaica**
b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 17
17a. Basal lateral veins up to 1/10–1/4 the length of the lamina 18
b. Basal lateral veins up to 1/4–1/3(–1/2) the length of the lamina 19
18a. Petiole 0.5–1(–1.5) cm long; base of the lamina rounded to obtuse, apex rounded to obtuse to short-acuminate . . . . . **10. F. acamptophylla**
b. Petiole 1.5–2.5(–3) cm long; base of the lamina cuneate to obtuse, apex acuminate . . . . . **50. F. pellucidopunctata**
19a. Stipules distinctly hairy; margin of the lamina not callose towards the base; apex of the lamina acuminate . . . . . **59. F. subgelderi**
b. Stipules glabrous (or sparsely and minutely puberulous); margin of the lamina usually callose towards the base; apex of the lamina rounded to short-acuminate . . . . . **21. F. callophylla**

20a. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 21
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 29
21a. Basal lateral veins branched, 1/3–1/2 the length of the lamina; margin of the lamina not callose towards the base . . . . . **51. F. pisocarpa**
b. Basal lateral veins unbranched, mostly up to 1/4 the length of the lamina, or if up to 1/3(–1/2), then the margin of the lamina ± callose towards the base 22
22a. Ostiole (sub)conical 23
b. Ostiole flat, slightly prominent, or slightly sunken 24
23a. Fig receptacle 0.4–0.7 cm diam. when dry; stipules 0.5–1(–1.2) cm long . . . . . **29. F. delosyce**
b. Fig receptacle (0.5–)0.7–1.2 cm diam. when dry; stipules (0.5–)1–1.5(–2) cm long . . . . . **10. F. acamptophylla**
24a. Tertiary and smaller veins of the lamina obscure beneath; stipules 0.5–1 cm long; fig receptacle 0.3–0.4 cm diam. when dry . . . . . **45. F. microsyce**
b. Tertiary and smaller veins of the lamina distinct; stipules mostly 1–2 cm long, or if 0.5–1 cm long, then the fig receptacle 0.5–0.8(–1) cm diam. when dry . . . 25
25a. Basal bracts 3–8(–10) mm long; fig receptacle 0.7–1.3(–1.8) cm diam. when dry 26
b. Basal bracts 1–3 mm long; fig receptacle 0.3–0.6(–0.8) cm diam. when dry, basal lateral veins up to 1/4–1/2 the length of the lamina, and/or petioles, stipules, and basal bracts usually glabrous 27
26a. Basal lateral veins up to 1/10–1/4 the length of the lamina; petioles, stipules, and basal bracts minutely white puberulous; margin of the lamina not callose towards the base . . . . . **10. F. acamptophylla**
b. Basal lateral veins up to 1/4–1/3(–1/2) the length; petioles, stipules, and basal bracts usually glabrous; margin of the lamina ± callose towards the base . . . . . **21. F. callophylla**
27a. Petioles or stipules usually 1–2 cm long; basal lateral veins usually 1/10–1/4 the length of the lamina . . . . . **17. F binnendijkii**
b. Petioles and stipules usually 0.5–1 cm long; basal lateral veins usually 1/4–1/2 the length of the lamina 28
28a. Basal bracts 2–3 mm long; apex of the lamina short-acuminate (with an obtuse acumen) to obtuse to subacute to rounded . . . . . **44. F. microcarpa**
b. Basal bracts 1.5–2 mm long; apex of the lamina usually acuminate to subcaudate . . . . . **47. F. pallescens**
29a. Stipules and/or petioles usually 0.5–1 cm long; apex of the lamina rounded to obtuse or to subacute to short-acuminate (with obtuse acumen); basal bracts 0.5–4 mm long 30
b. Stipules and petioles usually 1–1.5 cm long, or up to 3 or 4 cm long, resp.; apex of the lamina acuminate, or if rounded to obtuse, then the basal bracts 4–8(–10) mm long 32
30a. Tertiary venation (nearly) invisible . . . . . **56. F. spathulifolia**
b. Tertiary venation visible 31
31a. Fig receptacle with internal hairs; midrib of the lamina flat to slightly prominent or impressed above; acumen of the lamina obtuse; basal bracts 2–3 mm long . . . . . **44. F. microcarpa**

b. Fig receptacle without internal hairs; midrib of the lamina impressed above; acumen of the lamina usually acute; basal bracts 3–8(–10) mm long . . . . . **60. F. sumatrana**

32a. Apex of the lamina acuminate, the acumen usually acute; margin of the lamina not callose . . . . . **60. F. sumatrana**

b. Apex of the lamina rounded to short-acuminate, the acumen usually obtuse; margin of the lamina ± callose towards the base . . . . . **21. F. callophylla**

33a. Fig receptacle longer than wide 34

b. Fig receptacle about as long as wide (or wider than high) 49

34a. Fig receptacle 2–3 cm diam. when dry 35

b. Fig receptacle 0.3–2 cm diam. when dry 38

35a. Basal lateral veins (1/4–)1/3–1/2 the length of the lamina; tertiary venation of the lamina reticulate to subscalariform . . . . . **63. F. xylophylla**

b. Basal lateral veins up to 1/4 the length of the lamina, or if up to 1/3, then the tertiary venation of the lamina partly parallel to the lateral veins (towards the midrib) 36

36a. Stipules 1–1.5(–2) cm long; (main) basal lateral veins often branched, often 1–3 pairs of smaller lateral veins below the main ones; base of the lamina cordate to rounded . . . . . **31. F. drupacea**

b. Stipules (1.5–)2–4 cm long; basal lateral veins unbranched, usually without smaller lateral veins below the (main) ones; base of the lamina rounded to cuneate (rarely subcordate) 37

37a. Tertiary venation of the lamina partly parallel to the lateral veins (towards the midrib), the midrib impressed above . . . . . **37. F. juglandiformis**

b. Tertiary venation of the lamina reticulate to subscalariform, the midrib flat above . . . . . **12. F. annulata**

38a. Fig receptacle 1–2 cm diam. when dry 39

b. Fig receptacle 0.3–1 cm diam. when dry 45

39a. Basal bracts 0.5–3 mm long 40

b. Basal bracts 3–12 mm long 41

40a. Stipules 1–1.5(–2) cm long; base of the lamina cordate to rounded . . . . . **31. F. drupacea**

b. Stipules 2–4 cm long; base of the lamina rounded or to subattenuate . . . . . **11. F. altissima**

41a. Petiole 0.5–1(–1.5) cm long, 1–2 mm thick 42

b. Petiole 1–5.5 cm long, 2–3(–5) mm thick 43

42a. Basal bracts 3–5 mm long; fig receptacle 0.5–1.2 cm diam. when dry . . . . . **10. F. acamptophylla**

b. Basal bracts 5–8 mm long; fig receptacle 1.5–2 cm diam. when dry . . . . . **61. F. sundaica**

43a. Ostiole ± open, the 3 upper ostiolar bracts not or slightly imbricate . . . . . **59. F. subgelderi**

b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 44

44a. Midrib of the lamina impressed above; petiole 2.5–5.5 cm long, 4–5 mm thick . . . . . **37. F. juglandiformis**

b. Midrib slightly prominent to flat (or in thick laminas slightly impressed); petiole 1–2.5(–4) cm long, 2–3 mm thick . . . . . **61. F. sundaica**
45a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 46
b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 47
46a. Basal bracts semicircular to suborbicular, imbricate, the apex rounded . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Basal bracts ovate, not (or only basally) imbricate, the apex obtuse . . . . . **61. F. sundaica**
47a. Basal lateral veins branched; lateral veins (3–)4–6 pairs . . . . . **51. F. pisocarpa**
b. Basal lateral veins (usually) unbranched; lateral veins 6–12 pairs 48
48a. Fig receptacle ellipsoid; petiole usually 1–2 cm long . **50. F. pellucidopunctata**
b. Fig receptacle ovoid; petiole usually 0.5–1 cm long . . . . **10. F. acamptophylla**
49a. Fig receptacle 1–2 cm diam. when dry 50
b. Fig receptacle 0.3–1 cm diam. when dry 58
50a. Indumentum on various parts (as leafy twigs and midrib of the lamina beneath) brown floccose-tomentose 51
b. Indumentum not floccose-tomentose 52
51a. Apex of the fig receptacle concave, the ostiole sunken; stipules 2–6 cm long, subpersistent . . . . . **19. F. bracteata**
b. Apex of the fig receptacle convex to submammillate, the ostiole ± prominent; stipules 1–2 cm long, mostly caducous . . . . . **23. F. consociata**
52a. Basal bracts 0.5–3 mm long . . . . . **28. F. curtipes**
b. Basal bracts (3–)4–10(–18) mm long 53
53a. Lamina on the midrib above and the midrib and lateral veins beneath white puberulous; base of the lamina cordate to rounded . . . . . **15. F. benghalensis**
b. Lamina above and beneath glabrous or sometimes minutely puberulous on the midrib beneath; base of the lamina cuneate to rounded 54
54a. Basal bracts semicircular to suborbicular with a rounded apex, imbricate, covering 1/3–2/3 of the receptacle . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Basal bracts (broadly) ovate, not (or only basally) imbricate with an obtuse to acute or to rounded apex, covering up to 1/3 (or 1/2) of the receptacle 55
55a. Apex of the lamina acuminate, usually with an acute acumen; basal bracts ovate, not or only imbricate at the base . . . . . **61. F. sundaica**
b. Apex of the lamina rounded to obtuse, or if acuminate, then with an obtuse acumen; basal bracts semicircular to broadly ovate, ± imbricate 56
56a. Base of the lamina and the lower part of the margin not (or hardly) callose; smaller veins of the lamina, even the reticulum ± clearly visible beneath; basal bracts usually covering 1/2 or more of the fig receptacle . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Base of the lamina and (at least) the lower part of the margin ± distinctly callose; smaller veins of the lamina usually not clearly visible to obscure; basal bracts covering up to 1/2 of the fig receptacle 57
57a. Lateral veins 6–10 pairs; apex of the lamina (usually) short-acuminate . . . . . **21. F. callophylla**
b. Lateral veins 10–13 pairs; apex of the lamina (usually) rounded **28. F. curtipes**

58a. Basal bracts 0.5–2.5 mm long 59
b. Basal bracts 3–8(–10) mm long 61
59a. Ostiole open, the 3 upper ostiolar bracts not or slightly imbricate . . . . . **17. F. binnendijkii**
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 60
60a. Basal lateral veins up to 1/20–1/10 the length of the lamina; apex of the lamina short-acuminate . . . . . **38. F. kerkhovenii**
b. Basal lateral veins up to usually 1/4–1/3 the length of the lamina; apex of the lamina usually rounded . . . . . **28. F. curtipes**
61a. Indumentum on various parts (as stipules and midrib of the lamina beneath) brown floccose-tomentose . . . . . **23. F. consociata**
b. Indumentum not floccose-tomentose 62
62a. Leafy twigs (and often also on other parts) abundant small dark brown appressed hairs; tertiary venation ± prominent beneath . . . . . **39. F. kochummeniana**
b. Leafy twigs without such hairs or if present, then very sparse and inconspicuous; tertiary venation (almost) flat beneath 63
63a. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 64
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 67
64a. Basal lateral veins up to 1/10–1/4 the length of the lamina 65
b. Basal lateral veins up to 1/4–1/2 the length of the lamina 66
65a. Fig receptacle 0.3–0.6 cm diam. when dry; basal bracts 1–2 mm long . . . . . **17. F. binnendijkii**
b. Fig receptacle (0.5–)0.7–1.2 cm diam. when dry; basal bracts 3–5 mm long . . . . . **10. F. acamptophylla**
66a. Lateral veins of the lamina 6–10 pairs; basal lateral veins unbranched, sometimes faintly branched . . . . . **21. F. callophylla**
b. Lateral veins of the lamina (3–)4–6 pairs; basal lateral veins branched . . . . . **51. F. pisocarpa**
67a. Lateral veins 10–13 pairs . . . . . **28. F. curtipes**
b. Lateral veins (3–)4–8(–9) pairs . . . . . **61. F. sundaica**

REGIONAL KEY: JAVA

1a. Stipules connate, 6–25 cm long . . . . . **64. F. elastica**
b. Stipules free, usually less than 6 cm long, on opening shoots, in some species up to 8 cm long 2
2a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 3
b. Internodes not conspicuously different in length 8
3a. Apex of the lamina caudate . . . . . **4. F. religiosa**
b. Apex of the lamina acuminate, mostly shortly so 4
4a. Major basal lateral veins up to 1/3–1/2 the length of the lamina; cystoliths on both sides of the lamina (in dried material visible as minute pustules); ovary white . . . . . **5. F. rumphii**

b. Major basal lateral veins 1/10–1/3 the length of the lamina; cystoliths (usually) only beneath; ovaries red(-brown) 5
5a. Lateral veins 4–7 pairs; margin of upper ostiolar bracts ciliolate **6. F. saxophila**
b. Lateral veins 7–16 pairs; upper ostiolar bracts glabrous (or sparsely puberulous outside) 6
6a. Epidermis of the petiole (usually) flaking off, at least at the uppermost and/or basal part; peduncle 0.1–0.5 cm long . . . . . **1. F. caulocarpa**
b. Epidermis of the petiole persistent; peduncle 0.7–1.5 cm long or at most 0.1 cm long 7
7a. Stipules at the apices of leafy twigs subpersistent and forming ovoid buds (the scars of the stipules concentrated at the base of the new season's growth); peduncle 0.7–1.5 cm long; basal bracts caducous . . . . . **8. F. superba**
b. Stipules not forming distinct terminal buds; figs sessile or up to 0.1 cm long pedunculate; basal bracts persistent . . . . . **9. F. virens**
8a. Figs pedunculate or sessile with a peduncle-like stipe 9
b. Figs sessile 12
9a. Apex of the peduncle widened into a rim (bearing the basal bracts inside) . . 10
b. Apex of the peduncle not widened into a rim 11
10a. Midrib of the lamina beneath laterally hairy, often with hairs concentrated in the axils of the lateral veins . . . . . **30. F. depressa**
b. Midrib of the lamina beneath with hairs evenly distributed or absent . . . . . **12. F. annulata**
11a. Basal bracts (early) caducous; fig receptacle subglobose, 0.5–0.7 cm diam. when dry . . . . . **34. F. glaberrima**
b. Basal bracts persistent; fig receptacle ellipsoid to subglobose, 0.8–1.2 cm diam. when dry . . . . . **35. F. globosa**
12a. Tertiary venation parallel to the lateral veins (such as in *F. elastica*); lateral veins departing in wide angles (towards 90°) 13
b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 16
13a. Fig receptacle ellipsoid, ovoid, or cylindrical; petioles and stipules usually 1.5–3 cm long . . . . . **58. F. subcordata**
b. Fig receptacle subglobose, or if distinctly longer than wide, then the petioles and/or stipules usually up to 1.5 cm long 14
14a. Fig receptacle usually 1–1.8 cm diam. when dry; basal bracts 3–8(–10) mm long . . . . . **57. F. stricta**
b. Fig receptacle 0.5–1 cm diam. when dry, or if more than 1 cm diam., then the basal bracts 0.5–3 mm long 15
15a. Midrib (at least in the lower part) of the lamina slightly prominent; petiole, stipules and fig receptacle when dry usually blackish . . . . . **40. F. kurzii**
b. Midrib (at least in the lower part) of the lamina slightly impressed; petiole, stipules and fig receptacle when dry usually pale yellowish . . . . . **16. F. benjamina**
16a. Lamina mostly up to 10 cm, rarely up to 15 cm long 17
b. Lamina mostly longer than 10 cm, up to c. 20 or up to c. 30 cm 25

17a. Fig receptacle longer than wide (ellipsoid, obovoid, or ovoid) 18
b. Fig receptacle about as long as broad (subglobose) 19
18a. Lamina acuminate, the acumen acute . . . . . **61. F. sundaica**
b. Lamina short-acuminate to rounded, the acumen usually obtuse . . . . . **21. F. callophylla**
19a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 20
b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 22
20a. Lamina acuminate (to subcaudate); basal lateral veins unbranched . . . . . **60. F. sumatrana**
b. Lamina short-acuminate to rounded (to retuse); basal lateral veins branched . 21
21a. Lateral veins (3–)4–6 pairs, the basal pair distinctly branched; stipules mostly 0.5–1 cm long . . . . . **51. F. pisocarpa**
b. Lateral veins 6–10 pairs, the basal pair unbranched (or faintly branched); stipules usually 1–2 cm long . . . . . **21. F. callophylla**
22a. Basal lateral veins branched; basal bracts 3–5 mm long . . . . . **51. F. pisocarpa**
b. Basal lateral veins unbranched; basal bracts 1–3 mm long 23
23a. Lamina acuminate; basal bracts 1–2 mm long . . . . . **17. F. binnendijkii**
b. Lamina rounded to short-acuminate; basal bracts 2–8(–10) mm long 24
24a. Basal bracts 4–8(–10) mm long; stipules usually 1–2 cm long . . . . . **21. F. callophylla**
b. Basal bracts 2–3 mm long; stipules usually 0.5–1 cm long . **44. F. microcarpa**
25a. Fig receptacle longer than wide 26
b. Fig receptacle about as long as wide (or wider than high) 35
26a. Fig receptacle 2–3 cm diam. when dry 27
b. Fig receptacle 0.5–2 cm diam. when dry 29
27a. Basal bracts 10–20(–30) mm long; tertiary venation of the lamina (sub)scalariform . . . . . **26b. F. crassiramea** subsp. **stupenda**
b. Basal bracts 0.5–10 mm long; tertiary venation reticulate to subscalariform or partly parallel to the lateral veins (towards the midrib) 28
28a. Stipules (1.5–)2–4 cm long; basal lateral veins unbranched, usually without smaller lateral veins below the (main) ones . . . . . **12. F. annulata**
b. Stipules 1–1.5(–2) cm long; (main) basal lateral veins often branched, often 1–3 pairs of smaller lateral veins below the main ones . . . . . **31. F. drupacea**
29a. Fig receptacle 1–2 cm diam. when dry 30
b. Fig receptacle 0.5–1 cm diam. when dry 33
30a. Basal bracts 3–15(–18) mm long 31
b. Basal bracts 0.5–3 mm long 32
31a. Basal bracts covering up to 1/3(–1/2) of the receptacle . . . . . **61. F. sundaica**
b. Basal bracts covering 1/2–3/4 of the receptacle . . . . . **36. F. involucrata**
32a. Stipules 1–1.5(–2) cm long; base of the lamina cordate to rounded . . . . . **31. F. drupacea**
b. Stipules 2–4 cm long; base of the lamina rounded or to subattenuate . . . . . **11. F. altissima**
33a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate . . . . **61. F. sundaica**
b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 34

34a. Basal lateral veins branched; lateral veins (3–)4–6 pairs . . . . . **51. F. pisocarpa**
b. Basal lateral veins (usually) unbranched; lateral veins 6–12 pairs . . . . . **50. F. pellucidopunctata**
35a. Fig receptacle 1–2 cm diam. when dry 36
b. Fig receptacle 0.3–1(–1.1) cm diam. when dry 40
36a. Indumentum on various parts (as leafy twigs and midrib of the lamina beneath) brown floccose-tomentose . . . . . **23. F. consociata**
b. Indumentum not floccose-tomentose 37
37a. Lamina on the midrib above and the midrib and lateral veins beneath white puberulous; base of the lamina cordate to rounded . . . . . **15. F. benghalensis**
b. Lamina above and beneath glabrous or sometimes minutely puberulous on the midrib beneath; base of the lamina cuneate to rounded 38
38a. Apex of the lamina acuminate, the acumen usually acute; basal bracts ovate, not or only imbricate at the base . . . . . **61. F. sundaica**
b. Apex of the lamina rounded to obtuse, or if acuminate, then the acumen obtuse; basal bracts semicircular to broadly ovate, ± imbricate 39
39a. Base of the lamina and the lower part of the margin not (or hardly) callose; smaller veins of the lamina, even the reticulum ± clearly visible beneath; basal bracts usually covering 1/2 or more of the fig receptacle . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Base of the lamina and (at least) the lower part of the margin ± distinctly callose; smaller veins of the lamina usually not clearly visible to obscure; basal bracts covering up to 1/2 of the fig receptacle . . . . . **21. F. callophylla**
40a. Basal bracts 0.5–2 mm long 41
b. Basal bracts 3–8(–10) mm long 42
41a. Basal lateral veins ± distinct, 1/10–1/4 the length of the lamina; ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate . . . . . **17. F. binnendijkii**
b. Basal lateral veins not distinct, 1/20–1/10 the length of the lamina; petiole 1–2.5(–3) cm long; ostiole closed, the 3 upper ostiolar bracts clearly imbricate . . . . . **38. F. kerkhovenii**
42a. Indumentum on various parts (as stipules and midrib of the lamina beneath) brown floccose-tomentose . . . . . **23. F. consociata**
b. Indumentum not floccose-tomentose 43
43a. Leafy twigs (and often also on other parts) with abundant small dark brown appressed hairs; tertiary venation ± prominent beneath . . . . . **53. F. retusa**
b. Leafy twigs without such hairs or if present, then very sparse and inconspicuous; tertiary venation (almost) flat beneath 44
44a. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 45
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 47
45a. Basal lateral veins up to 1/10–1/4 the length of the lamina; basal bracts 1–2 mm long . . . . . **17. F. binnendijkii**
b. Basal lateral veins up to 1/4–1/2 the length of the lamina; basal bracts 3–8(–10) mm long 46
46a. Lateral veins of the lamina 6–10 pairs; basal lateral veins unbranched, sometimes faintly branched . . . . . **21. F. callophylla**

b. Lateral veins of the lamina (3–)4–6 pairs; basal lateral veins branched . . . . . **51. F. pisocarpa**

47a. Base of the lamina auriculate to cordulate; fig receptacle depressed-globose . . . . . **46. F. miqueliana**

b. Base of the lamina cuneate to rounded; fig receptacle subglobose to ovoid to ellipsoid to obovoid . . . . . **61. F. sundaica**

REGIONAL KEY: LESSER SUNDA ISLANDS

1a. Ostiole tri-radiate . . . . . **65. F. brachypoda**

b. Ostiole circular 2

2a. Stipules connate, 6–25 cm long . . . . . **64. F. elastica**

b. Stipules free, usually less than 6 cm long, on opening shoots, in some species up to 8 cm long 3

3a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 4

b. Internodes not conspicuously different in length 9

4a. Apex of the lamina caudate . . . . . **4. F. religiosa**

b. Apex of the lamina acuminate, mostly shortly so 5

5a. Major basal lateral veins up to 1/3–1/2 the length of the lamina; cystoliths on both sides of the lamina (in dried material visible as minute pustules); ovary white . . . . . **5. F. rumphii**

b. Major basal lateral veins 1/10–1/3 the length of the lamina; cystoliths (usually) only beneath; ovaries red(-brown) 6

6a. Lateral veins 4–7 pairs; margin of upper ostiolar bracts ciliolate . . . . . **6. F. saxophila**

b. Lateral veins 7–16 pairs; upper ostiolar bracts glabrous (or sparsely puberulous outside) 7

7a. Epidermis of the petiole (usually) flaking off, at least at the uppermost and/or basal part; peduncle 0.1–0.5 cm long . . . . . **1. F. caulocarpa**

b. Epidermis of the petiole persistent; peduncle 0.7–1.5 cm long or at most 0.1 cm long 8

8a. Stipules at the apices of leafy twigs subpersistent and forming ovoid buds (the scars of the stipules concentrated at the base of the new season's growth); peduncle 0.7–1.5 cm long; basal bracts caducous . . . . . **8. F. superba**

b. Stipules not forming distinct terminal buds; figs sessile or up to 0.1 cm long pedunculate; basal bracts persistent . . . . . **9. F. virens**

9a. Figs pedunculate 10

b. Figs sessile 11

10a. Lamina glabrous beneath . . . . . **34. F. glaberrima**

b. Lamina hairy on the midrib beneath . . . . . **30. F. depressa**

11a. Tertiary venation parallel to the lateral veins (such as in *F. elastica*); lateral veins departing in wide angles (towards 90°) . . . . . **16. F. benjamina**

b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 12
12a. Fig receptacle longer than wide . . . . . **31. F. drupacea**
b. Fig receptacle about as long as wide 13
13a. Lamina hairy . . . . . **15. F. benghalensis**
b. Lamina glabrous 14
14a. Basal bracts 2–3 mm long . . . . . **44. F. microcarpa**
b. Basal bracts 4–8(–10) mm long . . . . . **21. F. callophylla**

REGIONAL KEY: BORNEO

1a. Stipules connate, 6–25 cm long . . . . . **64. F. elastica**
b. Stipules free, usually less than 6 cm long, on opening shoots, in some species up to 8 cm long 2
2a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 3
b. Internodes not conspicuously different in length 6
3a. Apex of the lamina caudate . . . . . **4. F. religiosa**
b. Apex of the lamina acuminate, mostly shortly so 4
4a. Epidermis of petiole flaking off, at the uppermost or also at the basal part . . . . . **1. F. caulocarpa**
b. Epidermis of petiole persistent 5
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b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 14
13a. Fig receptacle ellipsoid, ovoid, or cylindrical; petioles and stipules usually 1.5–3 cm long . . . . . **58. F. subcordata**
b. Fig receptacle subglobose, or if distinctly longer than wide, then the petioles and/or stipules usually up to 1.5 cm long . . . . . **16. F. benjamina**
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20a. Stipules distinctly hairy; margin of the lamina not callose towards the base; apex of the lamina acuminate . . . . . **59. F. subgelderi**
b. Stipules glabrous (or sparsely and minutely puberulous); margin of the lamina usually callose towards the base; apex of the lamina rounded to short-acuminate . . . . . **21. F. callophylla**
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b. Basal lateral veins up to 1/4–1/3(–1/2) the length of the lamina; petioles, stipules, and basal bracts usually glabrous; margin of the lamina ± callose towards the base . . . . . **21. F. callophylla**

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b. Basal bracts 1.5–2 mm long; apex of the lamina usually acuminate to subcaudate . . . . . **47. F. pallescens**

29a. Stipules and/or petioles usually 0.5–1 cm long; apex of the lamina rounded to obtuse or to subacute to short-acuminate (with obtuse acumen); basal bracts 0.5–4 mm long 30

b. Stipules and petioles usually 1–1.5 cm long, or up to 3 or 4 cm long, respectively; apex of the lamina acuminate, or if rounded to obtuse, then the basal bracts 4–8(–10) mm long 32

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b. Fig receptacle without internal hairs; midrib of the lamina impressed above; acumen of the lamina usually acute . . . . . **60. F. sumatrana**

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b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 46
46a. Base of the lamina rounded to cordate (with a narrow sinus); lamina puberulous on the venation beneath and on the midrib above . . . . . **33. F. forstenii**
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50a. Fig receptacle ellipsoid; petiole usually 1–2 cm long . **50. F. pellucidopunctata**
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b. Base of the lamina and (at least) the lower part of the margin ± distinctly callose; smaller veins of the lamina usually not clearly visible to obscure; basal bracts covering up to 1/2 of the fig receptacle . . . . . **21. F. callophylla**
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b. Basal bracts 3–8(–10) mm long 62
61a. Ostiole open, the 3 upper ostiolar bracts not or slightly imbricate; basal lateral veins distinct, up to 1/10–1/4 the length of the lamina . . . . . **17. F. binnendijkii**
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate; basal lateral veins indistinct, up to 1/20–1/10 the length of the lamina . . . . . **38. F. kerkhovenii**
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b. Indumentum not floccose-tomentose 63
63a. Leafy twigs (and often also on other parts) with abundant small dark brown appressed hairs; tertiary venation ± prominent beneath 64

b. Leafy twigs without such hairs or if present, then very sparse and inconspicuous; tertiary venation (almost) flat beneath 65
64a. Petiole 0.5–1 cm long; apex of the lamina rounded; tertiary venation of the lamina slightly prominent (rather inconspicuous) . . . . . **53. F. retusa**
b. Petiole (0.5–)1–2.5 cm long; apex of the lamina acuminate to rounded; tertiary venation prominent (and conspicuous) . . . . . **39. F. kochummeniana**
65a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate . . . **61. F. sundaica**
b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 66
66a. Basal lateral veins up to 1/10–1/4 the length of the lamina 67
b. Basal lateral veins up to 1/4–1/2 the length of the lamina 68
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b. Fig receptacle (0.5–)0.7–1.2 cm diam. when dry; basal bracts 3–5 mm long . . . . . **10. F. acamptophylla**
68a. Lateral veins of the lamina 6–10 pairs; basal lateral veins unbranched, sometimes faintly branched . . . . . **21. F. callophylla**
b. Lateral veins of the lamina (3–)4–6 pairs; basal lateral veins branched . . . . . **51. F. pisocarpa**

REGIONAL KEY: PHILIPPINES

1a. Stipules connate, 6–25 cm long . . . . . **64. F. elastica**
b. Stipules free, usually less than 6 cm long, on opening shoots, in some species up to 8 cm long 2
2a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 3
b. Internodes not conspicuously different in length 8
3a. Apex of the lamina caudate . . . . . **4. F. religiosa**
b. Apex of the lamina acuminate, mostly shortly so 4
4a. Lateral veins 4–7 pairs; margin of upper ostiolar bracts ciliolate **6. F. saxophila**
b. Lateral veins 7–16 pairs; upper ostiolar bracts glabrous (or puberulous outside) 5
5a. Epidermis of petiole flaking off, at the uppermost or also at the basal part . . . . . **1. F. caulocarpa**
b. Epidermis of petiole persistent 6
6a. Basal lateral veins up to 1/5–1/3 the length of the lamina, mostly departing from the midrib at different distances from the base, their bases running parallel to the midrib . . . . . **3. F. prasinicarpa**
b. Basal lateral veins up to 1/10–1/5 the length of the lamina, their bases not running parallel to the midrib 7
7a. Peduncle 0–0.1 cm long; basal bracts persistent . . . . . **9. F. virens**
b. Peduncle 0.1–0.3(–0.5) cm long; basal bracts caducous . . . . . **2. F. concinna**
8a. Figs pedunculate 9
b. Figs sessile 13

9a. Fig receptacle 0.4–0.7(–1) cm diam. when dry . . . . . **41. F. lawesii**
b. Fig receptacle 1.2–3.5 cm diam. when dry 10
10a. Tertiary venation parallel to the lateral veins . . . . . **14. F. balete**
b. Tertiary venation reticulate to subscalariform 11
11a. Midrib of the lamina beneath laterally hairy, often with hairs concentrated in the axils of the lateral veins . . . . . **30. F. depressa**
b. Midrib of the lamina beneath with hairs evenly distributed or absent 12
12a. Fig receptacle subglobose; basal bracts c. 3 mm long . . . . . **22a. F. chrysolepis** subsp. **chrysolepis**
b. Fig receptacle usually ellipsoid to ovoid, rarely subglobose; basal bracts 3–11 mm long . . . . . **12. F. annulata**
13a. Tertiary venation parallel to the lateral veins (such as in *F. elastica*); lateral veins departing in wide angles (towards 90°) 14
b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 16
14a. Fig receptacle ellipsoid, ovoid, or cylindrical; petioles and stipules usually 1.5–3 cm long . . . . . **58. F. subcordata**
b. Fig receptacle subglobose, or if distinctly longer than wide, then the petioles and/or stipules usually up to 1.5 cm long 15
15a. Fig receptacle usually 1–1.8 cm diam. when dry; basal bracts 3–8(–10) mm long; cultivated . . . . . **57. F. stricta**
b. Fig receptacle 0.5–1 cm diam. when dry, or if more than 1 cm diam., then the basal bracts 0.5–3 mm long; indigenous and cultivated . . . . . **16. F. benjamina**
16a. Lamina mostly up to 10 cm, rarely up to 15 cm long 17
b. Lamina mostly longer than 10 cm, up to c. 20 or up to c. 30 cm 25
17a. Fig receptacle longer than wide (ellipsoid, obovoid, ovoid, or cylindrical) . . 18
b. Fig receptacle about as long as wide (subglobose) 20
18a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate . . . **61. F. sundaica**
b. Ostiole ± open, the upper 3 ostiolar bracts not or partly imbricate 19
19a. Basal lateral veins up to 1/10–1/8 the length of the lamina . . . . . **50. F. pellucidopunctata**
b. Basal lateral veins up to 1/4–1/3(–1/2) the length of the lamina . . . . . **21. F. callophylla**
20a. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 21
b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 23
21a. Basal bracts 2–3 mm long; fig receptacle with internal hairs **44. F. microcarpa**
b. Basal bracts 3–8(–10) mm long; fig receptacle without internal hairs 22
22a. Stipules usually 0.5–1 cm long . . . . . **51. F. pisocarpa**
b. Stipules usually 1–2 cm long . . . . . **21. F. callophylla**
23a. Basal bracts 2–3 mm long; fig receptacle with internal hairs **44. F. microcarpa**
b. Basal bracts 3–8(–10) mm long; fig receptacle without internal hairs 24
24a. Apex of lamina rounded to short-acuminate, the acumen obtuse . . . . . **21. F. callophylla**
b. Apex of lamina acuminate, the acumen usually acute . . . . . **60. F. sumatrana**

25a. Fig receptacle longer than wide 26
b. Fig receptacle about as long as wide (or wider than high) 39
26a. Fig receptacle 2–3 cm diam. when dry 27
b. Fig receptacle 0.3–2 cm diam. when dry 29
27a. Stipules (1.5–)2–4 cm long; basal lateral veins unbranched, usually without smaller lateral veins below the (main) ones; base of the lamina rounded to cuneate (rarely subcordate) . . . . . **12. F. annulata**
b. Stipules 1–1.5(–2) cm long; (main) basal lateral veins often branched, often 1–3 pairs of smaller lateral veins below the main ones; base of the lamina cordate to rounded 28
28a. Stipules brownish (woolly) tomentose to subvillous or glabrous; fig receptacle glabrous inside . . . . . **31. F. drupacea**
b. Stipules sparsely to densely yellowish sericeous; fig receptacle hairy inside, on the inner surface or also on the pedicels . . . . . **24. F. cordatula**
29a. Fig receptacle 1–2 cm diam. when dry 30
b. Fig receptacle 0.3–1 cm diam. when dry 35
30a. Indumentum (partly) set(ul)ose with irritating hairs . . . . . **27. F. cucurbitina**
b. Indumentum not set(ul)ose 31
31a. Basal bracts 1–3 mm long 32
b. Basal bracts 3–12 mm long 33
32a. Stipules 1–1.5(–2) cm long; base of the lamina cordate to rounded . . . . . **31. F. drupacea**
b. Stipules 2–4 cm long; base of the lamina rounded or to subattenuate . . . . . **11. F. altissima**
33a. Lamina and stipules usually glabrous; apex acuminate, the acumen acute . . . . . **61. F. sundaica**
b. Lamina and stipules hairy, or if glabrous, then the apex of the lamina short-acuminate and the acumen obtuse 34
34a. Midrib (and lateral veins) ± impressed above; stipules brownish to whitish sericeous to puberulous; base of lamina mostly (sub)cordate with a narrow sinus . . . . . **33. F. forstenii**
b. Midrib (and lateral veins) slightly prominent to flat or the midrib sometimes slightly impressed; stipules glabrous or white (minutely) puberulous; base of lamina mostly cuneate to rounded . . . **26a. F. crassiramea** subsp. **crassiramea**
35a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 36
b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 37
36a. Basal bracts semicircular to suborbicular, imbricate, the apex rounded . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Basal bracts ovate, not (or only basally) imbricate, the apex obtuse . . . . . **61. F. sundaica**
37a. Basal lateral veins branched; lateral veins (3–)4–6 pairs . . . . . **51. F. pisocarpa**
b. Basal lateral veins (usually) unbranched; lateral veins 6–12 pairs 38
38a. Basal lateral veins 1/4–1/3(–1/2) the length of the lamina; apex of the lamina rounded to short-acuminate (with an obtuse acumen); leafy twigs, petioles and stipules usually glabrous . . . . . **21. F. callophylla**

b. Basal lateral veins up to 1/10–1/4 the length of the lamina; apex of the lamina acuminate, or if short-acuminate to rounded, then the leafy twigs, petioles and stipules puberulous . . . . . **50. F. pellucidopunctata**
39a. Fig receptacle 1–2 cm diam. when dry 40
b. Fig receptacle 0.3–1 cm diam. when dry 44
40a. Lamina on the midrib above and the midrib and lateral veins beneath white puberulous; base of the lamina cordate to rounded . . . . . **15. F. benghalensis**
b. Lamina above and beneath glabrous or sometimes minutely puberulous on the midrib beneath; base of the lamina cuneate to rounded 41
41a. Basal bracts semicircular to suborbicular with a rounded apex, imbricate, covering 1/3–2/3 of the receptacle . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Basal bracts (broadly) ovate, not (or only basally) imbricate, with an obtuse to acute or to rounded apex covering up to 1/3 (or 1/2) of the receptacle 42
42a. Apex of the lamina acuminate, usually with an acute acumen; basal bracts ovate, not or only imbricate at the base . . . . . **61. F. sundaica**
b. Apex of the lamina rounded to obtuse, or if acuminate, then with an obtuse acumen; basal bracts semicircular to broadly ovate, ± imbricate 43
43a. Base of the lamina and the lower part of the margin not (or hardly) callose; smaller veins of the lamina, even the reticulum ± clearly visible beneath; basal bracts usually covering 1/2 or more of the fig receptacle . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Base of the lamina and (at least) the lower part of the margin ± distinctly callose; smaller veins of the lamina usually not clearly visible to obscure; basal bracts covering up to 1/2 of the fig receptacle . . . . . **21. F. callophylla**
44a. Basal bracts 0.5–2.5 mm long . . . . . **38. F. kerkhovenii**
b. Basal bracts 3–8(–10) mm long 45
45a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate . . . . **61. F. sundaica**
b. Ostiole ± open, the 3 upper ostiolar bracts not or partly imbricate 46
46a. Lateral veins 6–10 pairs, the basal pair unbranched, sometimes faintly branched . . . . . **21. F. callophylla**
b. Lateral veins (3–)4–6 pairs, the basal pair branched . . . . . **51. F. pisocarpa**

REGIONAL KEY: CELEBES

1a. Ostiole slit-shaped, the upper ostiolar bracts descending . . . . **66. F. glandifera**
b. Ostiole circular, the upper ostiolar bracts horizontal 2
2a. Stipules connate, 6–25 cm long . . . . . **64. F. elastica**
b. Stipules free, usually less than 6 cm long, on opening shoots, in some species up to 8 cm long 3
3a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 4
b. Internodes not conspicuously different in length 10
4a. Apex of the lamina caudate . . . . . **4. F. religiosa**
b. Apex of the lamina acuminate, mostly shortly so 5

5a. Major basal lateral veins up to 1/3–1/2 the length of the lamina; cystoliths on both sides of the lamina (in dried material visible as minute pustules); ovary white . . . . . **5. F. rumphii**
b. Major basal lateral veins 1/10–1/3 the length of the lamina; cystoliths (usually) only beneath; ovary red(-brown) 6
6a. Lateral veins 4–7 pairs; margin of upper ostiolar bracts ciliolate **6. F. saxophila**
b. Lateral veins 7–16 pairs; upper ostiolar bracts glabrous 7
7a. Epidermis of petiole flaking off, at the uppermost or also at the basal part . . . . . **1. F. caulocarpa**
b. Epidermis of petiole persistent 8
8a. Peduncle 0.7–1.5 cm long; basal bracts caducous . . . . . **8. F. superba**
b. Peduncle 0–0.2 cm long; basal bracts persistent 9
9a. Basal lateral veins up to 1/5–1/3 the length of the lamina, mostly departing from the midrib at different distances from the base, their bases running parallel to the midrib . . . . . **3. F. prasinicarpa**
b. Basal lateral veins up to 1/10–1/5 the length of the lamina, their bases not running parallel to the midrib . . . . . **9. F. virens**
10a. Figs pedunculate 11
b. Figs sessile 12
11a. Fig receptacle subglobose, the basal bracts c. 3 mm long . . . . . **22. F. chrysolepis** subsp. **chrysolepis**
b. Fig receptacle usually ellipsoid to ovoid, rarely subglobose, the basal bracts 3–11 mm long . . . . . **12. F. annulata**
12a. Tertiary venation parallel to the lateral veins (such as in *F. elastica*); lateral veins departing in wide angles (towards 90°) 13
b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 15
13a. Fig receptacle ellipsoid, ovoid, or cylindrical; petioles and stipules usually 1.5–3 cm long . . . . . **58. F. subcordata**
b. Fig receptacle subglobose, or if distinctly longer than wide, then the petioles and/or stipules usually up to 1.5 cm long 14
14a. Stipules 1.5–2.5 cm long; ostiole closed; basal bracts mostly ± connate . . . . . **49. F. patellata**
b. Stipules usually 0.5–1.5 cm long; ostiole ± open; basal bracts free . . . . . **16. F. benjamina**
15a. Lamina mostly up to 10 cm, rarely up to 15 cm long 16
b. Lamina mostly longer than 10 cm, up to c. 20 or up to c. 30 cm 18
16a. Basal bracts 2–3 mm long; fig receptacle with internal hairs **44. F. microcarpa**
b. Basal bracts 3–8(–10) mm long; fig receptacle without internal hairs 17
17a. Apex of lamina rounded to short-acuminate, the acumen obtuse, ostiole mostly open, the 3 upper ostiolar bracts not or partly imbricate . . . . . **21. F. callophylla**
b. Apex of lamina acuminate, the acumen usually acute; ostiole closed, the 3 upper ostiolar bracts clearly imbricate . . . . . **60. F. sumatrana**

18a. Fig receptacle longer than wide 19
b. Fig receptacle about as long as wide (or wider than high) 27
19a. Fig receptacle 2–3 cm diam. when dry 20
b. Fig receptacle 0.3–2 cm diam. when dry 22
20a. Stipules (1.5–)2–4 cm long; basal lateral veins unbranched, usually without smaller lateral veins below the (main) ones; base of the lamina rounded to cuneate (rarely subcordate) . . . . . **12. F. annulata**
b. Stipules 1–1.5(–2) cm long; (main) basal lateral veins often branched, often 1–3 pairs of smaller lateral veins below the main ones; base of the lamina cordate to rounded 21
21a. Stipules brownish (woolly) tomentose to subvillous or glabrous; fig receptacle glabrous inside . . . . . **31. F. drupacea**
b. Stipules sparsely to densely yellowish sericeous; fig receptacle hairy inside, on the inner surface or also on the pedicels . . . . . **24. F. cordatula**
22a. Fig receptacle 1–2 cm diam. when dry 23
b. Fig receptacle 0.3–1 cm diam. when dry 26
23a. Basal bracts 0.5–3 mm long 24
b. Basal bracts 3–12 mm long 25
24a. Stipules 1–1.5(–2) cm long; base of the lamina cordate to rounded . . . . . **31. F. drupacea**
b. Stipules 2–4 cm long; base of the lamina rounded or to subattenuate . . . . . **11. F. altissima**
25a. Midrib (and lateral veins) ± impressed above; stipules brownish to whitish sericeous to puberulous; base of lamina mostly (sub)cordate with a narrow sinus . . . . . **33. F. forstenii**
b. Midrib (and lateral veins) slightly prominent to flat or the midrib sometimes slightly impressed; stipules glabrous or white (minutely) puberulous; base of lamina mostly cuneate to rounded . . . **26a. F. crassiramea** subsp. **crassiramea**
26a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate; areoles of lamina usually distinct beneath because of prominent veinlets . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Ostiole mostly open, the 3 upper ostiolar bracts not or partly imbricate; areoles and often also the tertiary of venation of lamina obscure beneath . . . . . **21. F. callophylla**
27a. Fig receptacle 1–2 cm diam. when dry 28
b. Fig receptacle 0.3–1 cm diam. when dry 29
28a. Lamina on the midrib above and the midrib and lateral veins beneath white puberulous; base of the lamina cordate to rounded . . . . . **15. F. benghalensis**
b. Lamina above and beneath glabrous or sometimes minutely puberulous on the midrib beneath; base of the lamina cuneate to rounded . . . . . **26a. F. crassiramea** subsp. **crassiramea**
29a. Base of the lamina and the lower part of the margin not (or hardly) callose; smaller veins of the lamina, even the reticulum ± clearly visible beneath; basal bracts usually covering 1/2 or more of the fig receptacle . . . . . **26a. F. crassiramea** subsp. **crassiramea**

b. Base of the lamina and (at least) the lower part of the margin ± distinctly callose; smaller veins of the lamina usually not clearly visible to obscure; basal bracts covering up to 1/2 of the fig receptacle . . . . . **21. F. callophylla**

REGIONAL KEY: MOLUCCAS

1a. Ostiole tri-radiate (to almost slit-shaped), the upper ostiolar bracts descending . . . . . **68. F. obliqua**
b. Ostiole circular, the upper ostiolar bracts horizontal 2
2a. Stipules connate, 6–25 cm long . . . . . **64. F. elastica**
b. Stipules free, usually less than 6 cm long, on opening shoots, in some species up to 8 cm long 3
3a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 4
b. Internodes not conspicuously different in length 10
4a. Apex of the lamina caudate . . . . . **4. F. religiosa**
b. Apex of the lamina acuminate, mostly shortly so 5
5a. Major basal lateral veins up to 1/3–1/2 the length of the lamina; cystoliths on both sides of the lamina (in dried material visible as minute pustules); ovary white . . . . . **5. F. rumphii**
b. Major basal lateral veins 1/10–1/3 the length of the lamina; cystoliths (usually) only beneath; ovary red(-brown) 6
6a. Epidermis of petiole flaking off, at the uppermost or also at the basal part . . . 7
b. Epidermis of petiole persistent 8
7a. Basal bracts persistent; fig receptacle 0.3–0.5(–0.7) cm diam. when dry . . . . . **1. F. caulocarpa**
b. Basal bracts caducous; fig receptacle 0.7–1.2 cm in diam. when dry . . . . . **7. F. subpisocarpa**
8a. Peduncle 0.7–1.5 cm long; basal bracts caducous . . . . . **8. F. superba**
b. Peduncle 0–0.2 cm long; basal bracts persistent 9
9a. Basal lateral veins up to 1/5–1/3 the length of the lamina, mostly departing from the midrib at different distances from the base, their bases running parallel to the midrib . . . . . **3. F. prasinicarpa**
b. Basal lateral veins up to 1/10–1/5 the length of the lamina, their bases not running parallel to the midrib . . . . . **9. F. virens**
10a. Figs pedunculate 11
b. Figs sessile 12
11a. Fig receptacle 0.4–0.7(–1) cm diam. when dry . . . . . **41. F. lawesii**
b. Fig receptacle 1.2–3.5 cm diam. when dry . . . . . **22a. F. chrysolepis** subsp. **chrysolepis**
12a. Tertiary venation parallel to the lateral veins (such as in *F. elastica*); lateral veins departing in wide angles (towards 90°) 13
b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 14

13a. Fig receptacle ellipsoid, ovoid, or cylindrical; petioles and stipules usually 1.5–3 cm long . . . . . **58. F. subcordata**
b. Fig receptacle subglobose, or if distinctly longer than wide, then the petioles and/or stipules usually up to 1.5 cm long . . . . . **16. F. benjamina**
14a. Fig receptacle longer than wide 15
b. Fig receptacle about as long as broad 17
15a. Basal bracts 0.5–3 mm long; ostiole open, the upper 3 ostiolar bracts not or partly imbricate; stipules usually 1–1.5 cm long . . . . . **31. F. drupacea**
b. Basal bracts 4–15(–18) mm long; ostiole closed, the 3 upper ostiolar bracts clearly imbricate; stipules usually longer than 1.5 cm 16
16a. Apex of lamina acuminate, the acumen usually acute; areoles of lamina obscure beneath . . . . . **61. F. sundaica**
b. Apex of lamina short-acuminate, the acumen usually obtuse; areoles of lamina usually distinct beneath because of prominent veinlets . . . . . **26a. F. crassiramea** subsp. **crassiramea**
17a. Basal bracts 2–3 mm long; fig receptacle 0.5–0.8(–1) cm diam. when dry; lamina usually up to 10 cm long . . . . . **44. F. microcarpa**
b. Basal bracts 5–15 mm long; fig receptacle (0.8–)1–2 cm diam. when dry; lamina usually longer than 10 cm 18
18a. Lamina on the midrib above and the midrib and lateral veins beneath white puberulous; base of the lamina cordate to rounded . . . . . **15. F. benghalensis**
b. Lamina above and beneath glabrous or sometimes minutely puberulous on the midrib beneath; base of the lamina cuneate to rounded 19
19a. Basal bracts semicircular to suborbicular with a rounded apex, imbricate, covering 1/3–2/3 of the receptacle; areoles of lamina usually distinct beneath because of prominent veinlets . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Basal bracts (broadly) ovate, not (or only basally) imbricate, the apex obtuse to acute (or rounded), covering up to 1/3 (or 1/2) of the receptacle; areoles of lamina obscure beneath . . . . . **61. F. sundaica**

REGIONAL KEY: NEW GUINEA

1a. Ostiole tri-radiate or slit-shaped, the upper ostiolar bracts descending 2
b. Ostiole circular, the upper ostiolar bracts horizontal 5
2a. Ostiole slit-shaped 3
b. Ostiole tri-radiate 4
3a. Lateral veins 9–14 pairs; apex of the peduncle ± dilated; fig receptacle 0.4–1 cm diam. when dry . . . . . **69. F. rhizophoriphylla**
b. Lateral veins (12–)15–25(–30) pairs; apex of the peduncle extended into a cupule . . . . . **66. F. glandifera**
4a. Stipules 4–20 cm long; fig receptacle 1–4 cm diam. when dry, mostly ellipsoid . . . . . **67. F. hesperidiiformis**
b. Stipules 1–3 cm long; fig receptacle 0.3–1.2 cm diam. when dry, subglobose . . . . . **68. F. obliqua**
5a. Stipules connate, 6–25 cm long . . . . . **64. F. elastica**

b. Stipules free, usually less than 6 cm long, on opening shoots, in some species up to 8 cm long 6
6a. Internodes conspicuously different in length, the proximal ones of a season's growth long, subsequently shorter, the ultimate ones very short, sometimes with persistent stipules forming terminal buds 7
b. Internodes not conspicuously different in length 11
7a. Apex of the lamina caudate . . . . . **4. F. religiosa**
b. Apex of the lamina acuminate, mostly shortly so 8
8a. Lateral veins 4–7 pairs; margin of upper ostiolar bracts ciliolate **6. F. saxophila**
b. Lateral veins 7–16 pairs; upper ostiolar bracts glabrous 9
9a. Epidermis of petiole flaking off, at the uppermost or also at the basal part . . . . . **1. F. caulocarpa**
b. Epidermis of petiole persistent 10
10a. Basal lateral veins up to 1/5–1/3 the length of the lamina, mostly departing from the midrib at different distances from the base, their bases running parallel to the midrib . . . . . **3. F. prasinicarpa**
b. Basal lateral veins up to 1/10–1/5 the length of the lamina, their bases not running parallel to the midrib . . . . . **9. F. virens**
11a. Figs pedunculate or sessile with a peduncle-like stipe 12
b. Figs sessile 14
12a. Figs sessile with a peduncle-like stipe (the basal bracts at the base of the stipe) . . . . . **31. F. drupacea**
b. Figs pedunculate (the basal bracts at the apex of the peduncle) 13
13a. Fig receptacle 1.3–2 cm diam. when dry . . . . . **22b. F. chrysolepis** subsp. **novoguineensis**
b. Fig receptacle 0.4–1 cm diam. when dry 15
14a. Peduncle up to 0.5 cm long; lateral veins (3–)4–8(–10) pairs **44. F. microcarpa**
b. Peduncle 0.7–1.2 cm long; lateral veins (8–)10–14 pairs . . . . . **41. F. lawesii**
15a. Tertiary venation parallel to the lateral veins (such as in *F. elastica*); lateral veins departing in wide angles (towards 90°) 16
b. Tertiary venation partly to largely parallel to the lateral veins to reticulate towards the margin or reticulate to subscalariform towards the margin; lateral veins usually departing in more acute angles (about 60°) 19
16a. Fig receptacle ellipsoid, ovoid, or cylindrical; petioles and stipules usually 1.5–3 cm long . . . . . **58. F. subcordata**
b. Figs receptacle subglobose, or if distinctly longer than wide, then the petioles and/or stipules usually up to 1.5 cm long 17
17a. Fig receptacle usually 1–1.8 cm diam. when dry; basal bracts 3–8(–10) mm long . . . . . **13. F. archboldiana**
b. Fig receptacle 0.5–1 cm diam. when dry, or if more than 1 cm diam., then the basal bracts 0.5–3 mm long 18
18a. Stipules 1.5–2.5 cm long; basal bracts mostly ± connate . . . . . **49. F. patellata**
b. Stipules usually 0.5–1.5 cm long; basal bracts free . . . . . **16. F. benjamina**
19a. Fig receptacle longer than wide 20
b. Fig receptacle about as long as wide 21

20a. Basal bracts 0.5–3 mm long; stipules usually 1–1.5 cm long . . **31. F. drupacea**
b. Basal bracts 5–15(–18) mm long; stipules usually 2–4 cm long . . . . . **26a. F. crassiramea** subsp. **crassiramea**
21a. Lamina on the midrib above and the midrib and lateral veins beneath white puberulous; base of the lamina cordate to rounded . . . . . **15. F. benghalensis**
b. Lamina above and beneath glabrous or sometimes minutely puberulous on the midrib beneath; base of the lamina cuneate to rounded 22
22a. Basal bracts 5–15(–18) mm long; stipules usually 2–4 cm long . . . . . **26a. F. crassiramea** subsp. **crassiramea**
b. Basal bracts 2–3 mm long; stipules 0.5–1.5 cm long 23
23a. Fig receptacle with internal hairs; stipules usually 0.5–1 cm long . . . . . **44. F. microcarpa**
b. Fig receptacle without internal hairs; stipules 1–1.5 m long . . . . . **54. F. rigo**

Section Urostigma

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Urostigma* (Gasp.) Endl., Gen. Pl., Suppl. 4, 2 (1847) 35; Benth. & Hook., Gen. Pl. 3 (1880) 368; King, Sp. Ficus 1 (1887) 2, 13; Corner, Gard. Bull. Singapore 17 (1960) 371.

Trees, with ± clear morphological indications of intermittent growth, often deciduous. *Leaves* spirally arranged, articulate or subarticulate; lamina often ovate to subovate; cystoliths mostly only beneath; venation reticulate to subscalariform or partly parallel to the lateral veins; petiole relatively long. *Figs* axillary, more commonly just below the leaves, and or ramiflorous on up to c. 1 cm long spurs (short-shoots); basal bracts 3, mostly persistent; internal hairs present and often ± chaffy or absent. *Staminate flowers* near the ostiole or scattered among the pistillate ones, ostiole circular, the upper ostiolar bracts not descending; anthers with 2 thecae. *Stigmas* papillate and cohering. *Tepals* red(dish). *Ovary* red-brown (or white).

Distribution — From West Africa to the Pacific, with c. 90 species

Subdivision — The section can be divided into 2 subsections, with the same names as used for sections of the subgenus by Corner (1960): *Urostigma* and *Conosycea*, the former including sect. *Leucogyne* Corner (1960).

Section Urostigma subsection Urostigma

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Urostigma* (Gasp.) Endl. subsect. *Urostigma* (Gasp.) C.C. Berg, Blumea 49 (2004) 464. — *Urostigma* Gasp. sect. *Religiosa* Miq., Fl. Ind. Bat. 1, 2 (1859) 332. — *Ficus* L. subg. *Urostigma* (Gasp.) Miq. sect. *Urostigma* (Gasp.) Endl. ser. *Religiosae* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287.

Urostigma Gasp. sect. *Caulobotrya* Miq., Fl. Ind. Bat. 1, 2 (1859) 334. — *Ficus* L. subg. *Urostigma* (Gasp.) Miq. sect. *Urostigma* (Gasp.) Endl. ser. *Caulobotryae* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 371.

Ficus L. subg. *Urostigma* (Gasp.) Miq. ser. *Infectoriae* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286.

Ficus L. sect. *Gasparriniella* Sata, J. Soc. Trop. Agr. Taiwan 6 (1934) 18; Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 213, 377.

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Urostigma* (Gasp.) Endl. ser. *Orthoneurae* Corner, Gard. Bull. Singapore 17 (1960) 371.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Urostigma* (Gasp.) Endl. ser. *Superbae* Corner, Gard. Bull. Singapore 17 (1960) 371.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Leucogyne* Corner, Gard. Bull. Singapore 17 (1960) 371.

Trees, with ± clear morphological indications of intermittent growth, often deciduous. *Leaves* spirally arranged, often articulate or subarticulate; lamina often ovate to subovate; cystoliths mostly only beneath; venation reticulate to subscalariform or partly parallel to the lateral veins; petiole relatively long. *Figs* axillary, more commonly just below the leaves, and/or ramiflorous on up to c. 1 cm long spurs (short-shoots); basal bracts small, persistent or caducous; internal hairs present and often ± chaffy or absent. *Staminate flowers* near the ostiole (or scattered among the pistillate ones). *Tepals* red(dish). *Ovary* red-brown (or white).

DISTRIBUTION

From West Africa and Madagascar through the Asian mainland to Japan and through (southern) Malesia to Australia and the Pacific; mostly in relatively dry types of vegetation and/or seasonal conditions, often monsoon forest, savannah, or littoral vegetation, often on or near rocks, at low altitudes.

The subsection comprises c. 25 species, of which five African-Madagascan (see Berg & Wiebes, African fig trees and fig wasps, 1992); four are Indian; *F. prolixa* G. Forst. is confined to the Pacific region; *F. henneana* Miq. to Australia; and *F. prasinicarpa* to the Philippines; *F. virens* is widespread, ranging from Sri Lanka to N Australia and the Pacific; and the others can be regarded as elements of the Sino-Himalayan flora, some of them, *F. saxophila* and *F. superba* extending far into the Malesian region, the latter even to N Australia.

The distribution pattern of this subsection show similarities to the distribution of sect. *Pedunculatae* of subg. *Pharmacosycea* (see p. 162), to the *F. heterophylla*-group of subg. *Sycidium* (see p. 209), and to sect. *Phyllochlamys* of *Streblus*.

MORPHOLOGY

Habit — All species are essentially hemi-epiphytic, but without abundant aerial roots. Many of them are hemi-epilithic, or some often terrestrial. Most of the species remaining medium-sized trees and are rarely taller than 25 m, but *F. superba* and *F. virens* often become 30–35 m tall. Most species show intermittent growth, usually seasonal and accompanied with deciduousness. The stipules on growing twigs are often longer, on opening-shoots often much longer and thinner than those at the top of the season's growth, which in some species, as *F. caulocarpa* and *F. superba*, are subpersistent and form ovoid terminal buds. The scars of these stipules are concentrated at the basis of the season's growth.

Differences in colours or exfoliation of the periderm mark successive growth segments of the branches (when dried).

Leaves — Articulation of the leaves is often clear from features at the junction of the (relatively) long petiole and lamina. The articulation may cause that the petiole and lamina are not in the same plane. In *F. religiosa* the articulation makes that the leaves clatter in the wind like poplar leaves. The coriaceous lamina of subg. *Urostigma* has usually a well-developed hypodermis on both sides, but species of subsect. *Urostigma,* apart from *F. hookeriana* Corner, and *F. orthoneura* H. Lév. & Vaniot, have no hypodermis.

Figs — The figs are often borne below the leaves, in some species on spurs on the older wood. This dissociates fig production from growth rhythms of vegetative parts.

The change of colour in the maturation of the syconium is characteristic: from whitish to pinkish to purplish to blackish, although the final stages may not develop.

TAXONOMY

Corner (1960) created sect. *Leucosyce* to accommodate *F. amplissima* Sm. (India) and *F. rumphii*, distinct from the other Asian-Australasian species (ranked in sect. *Urostigma*; Corner 1960) in the colour of the ovaries, whitish vs red(-brown) and the position of the staminate flowers, scattered among the pistillate ones vs arranged near the ostiole. Moreover, both '*Leucosyce*' species have cystoliths at both sides of the lamina, whereas in the others nearly always only beneath. As such differences in the genus are found in related species or even within species, these differentiating characters are not strong enough to justify distinction at the section or subsection level. It is noteworthy that the two '*Leucosyce*' species are pollinated by species of *Eupristina* subg. *Parapristina*, of which other species are pollinators of some species of subsect. *Conosycea*, whereas the majority of subsect. *Urostigma* are pollinated by species of *Platyscapa*, of which some other species are associated with species of subsect. *Conosycea*.

The African-Madagascan species do not have articulate leaves.

The 'technical' morphological differences between subsect. *Urostigma* and subsect. *Conosycea* are rather weak and include absence of (sub)articulate leaves, more copious production of aerial roots, petioles relatively short and thick, staminate flowers consistently disperse, internal hairs mostly absent, the upper ostiolar bracts often not fully imbricate.

The ecological(-phytogeographic) aspect, as evident from the association with relatively dry habitats and seasonal conditions, intermittent growth, deciduousness, supports recognition of the group of species at the subsection level. However, *F. hookeriana* and *F. orthoneura*, two species of the Sino-Himalayan region, show a remarkable mixture of '*Conosycea*' and '*Urostigma*' characters.

The other c. 21 species of the subsection could be ranked into two groups: 1) with figs on spurs on the older wood, those put by Corner (1960) in the series *Caulobotryae* and *Superbae*; and 2) those in which the figs are borne axillary, or if below the leaves, then not on spurs.

1. **Ficus caulocarpa** (Miq.) Miq.

Ficus caulocarpa (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268, 287; Náves & Fern.-Vill., Nov. App. (1880) 199; Merr., Philipp. J. Sci., 1, Suppl. (1906) 46; Elmer, Leafl. Philipp. Bot. 1 (1907) 244; Corner, Gard. Bull. Singapore 10 (1939) 283; Wayside Trees (1940) 675, t. 201; Holttum, Gard. Bull. Singapore 11 (1940) 140; Corner, Gard. Bull. Singapore 21 (1965) 10; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 130, t. 8; J.C. Liao, Taxon. Rev. Moraceae Taiwan, ed. 2 (1995) 29, t. 9; Sasidh. & Augustine, Rheedea 9 (1999) 77. — *Urostigma caulocarpum* Miq., London J. Bot. 6 (1847) 568; Fl. Ind. Bat. 1, 2 (1859) 334; J. Bot. Néerl. 1 (1861) 234. — *Ficus infectoria* Roxb. var. *caulocarpa* (Miq.) King, Sp. Ficus 1 (1887) 63, t. 79; Merr., Bull. Bur. For. Philipp. 1 (1903) 18; Renner, Bot. Jahrb. Syst. 39 (1907) 383; Elmer, Leafl. Philipp. Bot. 4 (1911) 1246, 1313; 7 (1914) 2409; Merr., Enum. Born. (1921) 224.

Urostigma stipulosum Miq., London J. Bot. 6 (1847) 568; Fl. Ind. Bat. 1, 2 (1859) 334. — *Ficus stipulosa* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287; Náves & Fern.-Vill., Nov. App. (1880) 199; S. Vidal, Phan. Cuming. (1885) 146; Rev. Pl. Vasc. Filip. (1886) 254; Merr., Philipp. J. Sci., Bot. 3 (1908) 402; Fl. Manila (1912) 175; Enum. Philipp. Flow. Pl. 2 (1923) 65; Elmer, Leafl. Philipp. Bot. 9 (1937) 3454; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 214.

Ficus weinlandii K. Schum., Nachtr. Fl. Schutzgeb. Südsee (1905) 248. — Type: *Weinland 138* (B), Papua New Guinea, 'Finschhafen', Bumi River, March 1890, consists of leafless branches with figs of *F. caulocarpa* and a leafy twig and a leaf of a species of subsect. *Sycocarpus*; the former element is here designated as the lectotype.

Ficus caulobotrya Miq. var. *dasycarpa* Corner, Gard. Bull. Singapore 17 (1960) 378; Merr., Sp. Blancoan. (1918) 129; Philipp. J. Sci. 20 (1922) 368; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 216 (ut *F. argentea* Blanco).

Ficus pisocarpa auct. non Blume: King, Sp. Ficus 1 (1887) 48, t. 59.

Tree up to 20(–35) m tall, hemi-epiphytic, deciduous. *Branches* drying (red-)brown. *Leafy twigs* 2–4(–8) mm thick, slightly angular to subterete, glabrous. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)ovate to subobovate (or to lanceolate), 6–19 by 2–7.5 cm, (sub)coriaceous, apex (short-)acuminate, the acumen blunt to sharp, base rounded to subcordate or to obtuse (to cuneate); both surfaces glabrous; cystoliths only beneath; lateral veins 10–16 pairs, the basal pair up to c. 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, 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 up 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 ramiflorous on up to 0.3 cm long spurs, in pairs, solitary, or on spurs up to 8 together; peduncle 0.1–0.5 cm long, puberulous to glabrous; basal bracts 3, 1.5–2 mm long, puberulous or glabrous, often splitting into lobes, persistent; receptacle subglobose, 0.3–0.5(–0.7) cm diam. when dry, glabrous, turning from white to pink to purple to blackish at maturity, apex convex to flat, ostiole c. 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.

Distribution — Sri Lanka, Myanmar, Thailand, Ryukyu Islands, Taiwan; in *Malesia*: Malay Peninsula, Sumatra, Java, Lesser Sunda Islands (Lombok, Flores, Timor), Borneo, Philippines, Celebes (northern), Moluccas (Morotai, Ambon), New Guinea.

Habitat — Forest, often coastal, at low altitudes up to 1300 m.

Notes — 1. Material with densely white hairy receptacle and peduncles has not been encountered in the material examined from the Philippines and these features, also found in the type of var. *dasycarpa* (from India), are not included in the description.

2. Material with sessile figs occurs in Thailand.

3. The species is possibly introduced in Taiwan and the Ryukyu Islands.

4. Miquel successively described a *F. caulocarpa* (1867: 235) in subg. *Covellia* (= subg. *Sycomorus*) and currently in the synonymy of *F. botryocarpa* subsp. *botryocarpa*, and made the combination *F. caulocarpa* (1867: 268) based on *Urostigma caulocarpum* (1848: 568), and included *U. calaucarpum* in the synonymy *F. caulobotry* (1867: 287), based on *U. caulobotryum* (1847: 568) and a synonym of *F. tsjahela* Burm.f. from India and Sri Lanka.

2. Ficus concinna (Miq.) Miq.

Ficus concinna (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Náves in Blanco, Fl. Filip. ed. 3 (1879) f. 382; Náves & Fern.-Vill., Nov. App. (1880) 199; S. Vidal, Phan. Cuming. (1885) 146; Rev. Pl. Vasc. Filip. (1886) 251; Merr., Fl. Manila (1912) 176; Enum. Philipp. Flow. Pl. 2 (1923) 49; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 188; Corner, Gard. Bull. Singapore 21 (1965) 8; Kochummen, Tree Fl. Malaya 3 (1978) 144; Tree Fl. Sabah & Sarawak 3 (2000) 234. — *Urostigma concinnum* Miq., London J. Bot. 6 (1847) 570; Fl. Ind. Bat. 1, 2 (1859) 343. — *Ficus glabella* Blume var. *concinna* (Miq.) King, Sp. Ficus 1 (1887) 50.

Urostigma parvifolium Miq., London J. Bot. 6 (1847) 570; Fl. Ind. Bat. 1, 2 (1859) 343. — *Ficus parvifolia* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286, non Oken 1841; Náves & Fern.-Vill., Nov. App. (1880) 199; S. Vidal, Phan. Cuming. (1885) 146; Rev. Pl. Vasc. Filip. (1886) 251; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 465.

Ficus subpedunculata Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 217, 286. — *Ficus concinna* (Miq.) Miq. var. *subsessilis* Corner, Gard. Bull. Singapore 17 (1960) 376.

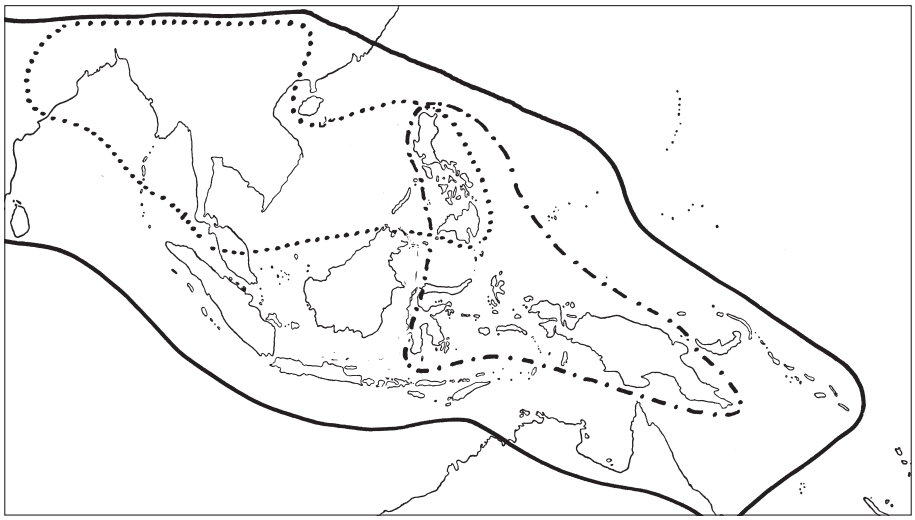
Ficus affinis Wall. ex Kurz, J. Asiat. Soc. Bengal 42, 2 (1873) 105; Kurz, Forest Fl. Burma 2 (1877) 444. — *Ficus glabella* Blume var. *affinis* (Wall. ex Kurz) King, Sp. Ficus 1 (1887) 50; Hand.-Mazz., Symb. Sin. 7 (1929) 92.

Ficus arayatensis Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 196.

Ficus fecundissima H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 9 (1911) 19.

?*Ficus pseudoreligiosa* H. Lév., Fl. Kouy-Tchéou (1914/1915) 432.

Tree up to 10(–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 to lanceolate, 4–10 by 1–4 cm, (sub)coriaceous, apex (short-) acuminate, the acumen sharp, base cuneate to obtuse; both surfaces glabrous; cystoliths only beneath (or on both sides); lateral veins 8–13 pairs, the basal pair up to 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 1–3.5(–5) cm long, glabrous, epidermis persistent; stipules 0.2–0.5 cm long, white puberulous or glabrous, caducous. *Figs* axillary and just below the leaves to ramiflorous on minute spurs, in pairs or solitary; peduncle 0.1–0.3(–0.5) cm long; basal bracts 3, 0.5–1.5 mm long, ciliolate, caducous; 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 to purple to black at maturity, apex convex, ostiole c. 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. — **Map 13.**



Map 13. Distribution of some species of subg. *Urostigma* subsect. *Urostigma*: *F. concinna* (Miq.) Miq. (dotted line); *F. prasinicarpa* Elmer (dot-dash line); *F. virens* Aiton (continuous line).

Distribution — NE India to S China, Indochina, Thailand, Andaman Islands; in *Malesia*: Malay Peninsula, Borneo (northern), Philippines (Luzon, Palawan).

Habitat — Rocky seashores (and forest?), at low altitudes; outside Malesia at altitudes up to 1300 m.

Notes — 1. Collections from the Philippines tend to have longer petioles and are less often ramiflorous than in the Asian mainland.

2. The presence of the species in northern Borneo (Bud Goya Island) and the Malay Peninsula (Pahang, Kota Glanggi), as indicated by Corner (1965: 8) could not be verified.

3. The species differs from *F. virens* by the distinctly pedunculate figs with caducous basal bracts.

3. **Ficus prasinicarpa** Elmer

Ficus prasinicarpa Elmer, Leafl. Philipp. Bot. 9 (1937) 3451; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 214; Corner, Gard. Bull. Singapore 21 (1965) 8.

Ficus glabella Blume var. *papuana* King, Sp. Ficus 1 (1887) 50; Diels, Bot. Jahrb. Syst. 67 (1935) 184.

Tree up to 10 m tall, often bushy and with crooked branches, hemi-epilithic, hemi-epiphytic, or terrestrial. *Branches* drying red-brown. *Leafy twigs* 2–4 mm thick, slightly angular to subterete, glabrous. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)ovate, 6–12(–18) by 3–6.5(–10) cm, subcoriaceous to coriaceous, apex acuminate, the acumen blunt to sharp, base rounded to subcordate or to obtuse; both surfaces glabrous; cystoliths only beneath; lateral veins 7–11 pairs, the basal pair up to 1/5–1/3 the length of the lamina, mostly branched, their basal parts running parallel to the mid-

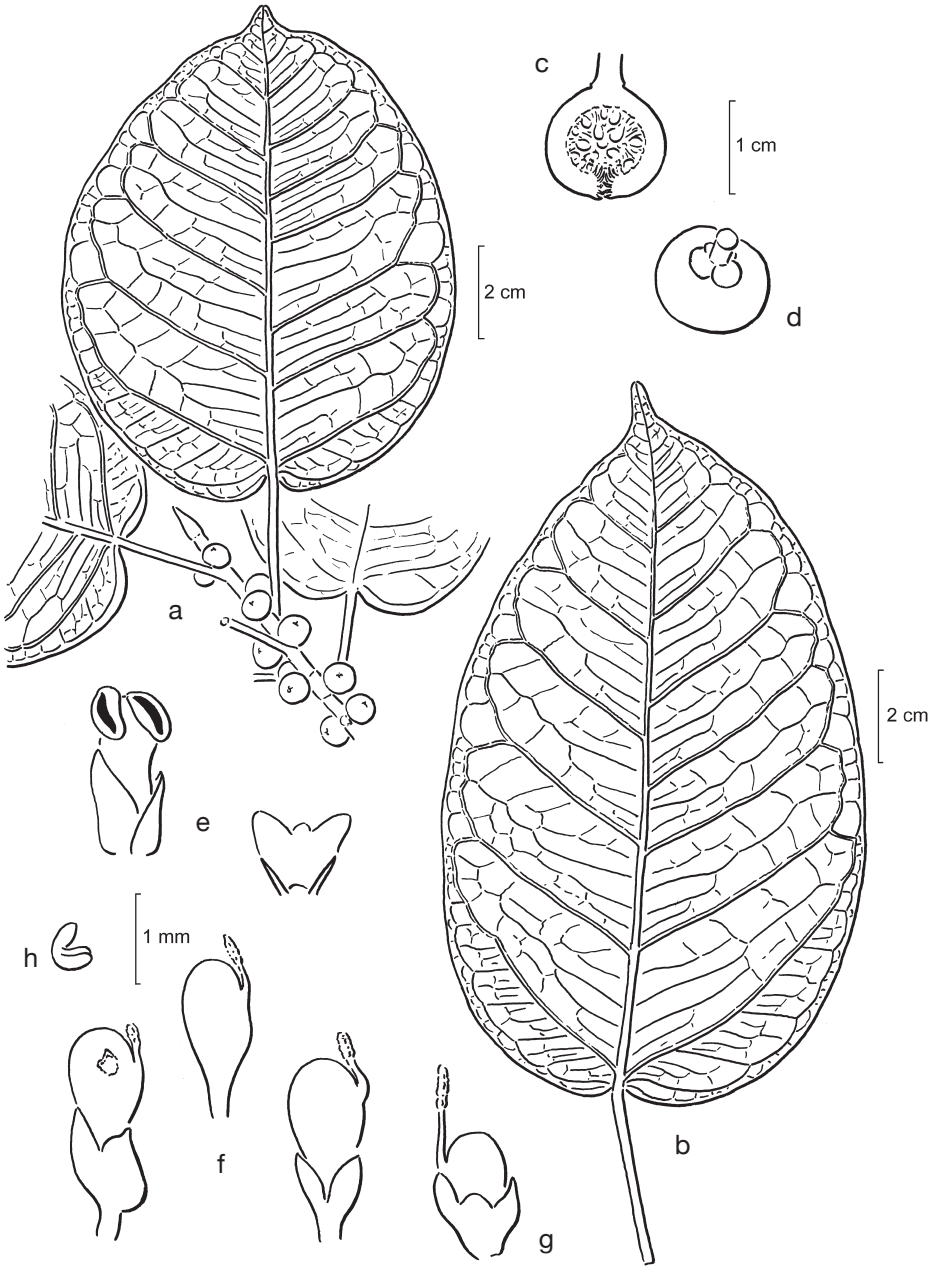


Fig. 104. *Ficus prasinicarpa* Elmer. a. Leafy twigs with figs; b. leaf; c. fig; d. basal bracts; e. staminate flower and perianth; f. short-styled flower of which one with opened 'gall-fruit' and pistil; g. long-styled flower; h. embryo (all: *RSS 2700*). From Philos. Trans., Ser. B, 253 (1967) 63.

rib and usually departing from the midrib at different distances from the base, tertiary venation reticulate to partly parallel to the lateral veins; waxy gland at the base of the midrib; petiole 1.5–3.5(–4.5) cm long, glabrous; stipules 0.2–0.8 cm long, glabrous or white puberulous, caducous. *Figs* axillary, more often below the leaves, or tending to ramiflorous on minute spurs, in pairs, solitary, or on the older wood up to 4 together, subsessile or with a peduncle up to 0.2 mm long; basal bracts 3, 1–2 mm long, glabrous, persistent; receptacle subglobose, 0.4–0.8 cm diam. when dry, 0.9–1.3 cm diam. when fresh, glabrous, purplish at maturity, apex convex to flat, ostiole c. 2 mm diam., prominent to flat, the upper ostiolar bracts glabrous; internal hairs absent. *Staminate flowers* near the ostiole. *Tepals* red. *Ovary* dark red. — **Fig. 104; Map 13.**

Distribution — Solomon Islands; in *Malesia*: Philippines (Luzon, Palawan), Celebes, Moluccas (Morotai), New Guinea.

Habitat — Often littoral vegetations or in savannahs, often on (coral) limestone rocks, sometimes as hemi-epiphytes in secondary growth or in submontane forest, at altitudes up to 1100 m.

Note — This species is closely related to *F. saxophila*, from which it differs in the presence of short peduncles and absence of indumentum on the basal and ostiolar bracts.

4. Ficus religiosa L.

Ficus religiosa L., Sp. Pl. (1753) 1059; Burm.f., Fl. Ind. (1768) 225; Lam., Encycl. 2, 2 (1788) 493; Blume, Bijdr. (1825) 436; Roxb., Fl. Ind., ed. Carey 3 (1832) 547; Wight, Ic. 6 (1853) t. 1967; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287; King, Sp. Ficus 1 (1887) 55, t. 67A; in Hook.f., Fl. Brit. India 5 (1888) 513; Watt, Dict. Econ. Prod. India 3 (1890) 357; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 132; Renner, Bot. Jahrb. Syst. 39 (1907) 383; Simon, Jahrb. Syst. Wiss. Bot. 54 (1914) 97; Koord., Atlas 4 (1916) t. 743; Ridl., Fl. Malay Penins. 3 (1924) 337; Gagnep., Fl. Indo-Chine 5 (1928) 767; Schierbeek, Natura n. 423 (1933) 258; Natura n. 436 (1935) 3; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1013; Alston, Kandy Fl. (1938) 34, f. 179; Corner, Wayside Trees (1940) 683, t. 204, 206; M.F. Barrett, Am. Midl. Nat. 45 (1951) 170; Worth., Ceylon Trees (1959) f. 414; Backer & Bakh.f., Fl. Java 2 (1965) 33; Corner, Gard. Bull. Singapore 21 (1965) 6; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 127. — *Urostigma religiosum* (L.) Gasp., Giorn. Bot. Ital. 2 (1844) 214; Rendiconti Reale Accad. Sci. Fis. 25 (1845) 81, t. 7, f. 1–5; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 343; Miq., London J. Bot. 6 (1847) 563; Fl. Ind. Bat. 1, 2 (1859) 333, t. 23.

Ficus caudata Stokes, Bot. Mat. Med. 4 (1812) 358, non Griff. 1854.

Ficus superstitiosa Link, Enum. Hort. Berol. 2 (1822) 449.

Ficus rhynchophylla Wall. ex Steud., Nomencl. Bot. ed. 2, 1 (1840) 637, nom. inval. in synon. — *Ficus religiosa* L. var. *rhynchophylla* (Wall. ex Steud.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287.

Urostigma affine Miq., London J. Bot. 6 (1847) 564.

Ficus peepul Griff., Notul. 4 (1854) 393.

Ficus religiosa L. var. *cordata* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287.

Tree up 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 beneath; lateral veins (6–)7–9 pairs, the basal pair

up 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, glabrous; stipules 0.5–1 cm long, ciliolate 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 ciliolate, 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.

Distribution — From Pakistan to S China, N Thailand to Vietnam; in *Malesia* cultivated.

Habitat — Sub Himalayan forest.

5. **Ficus rumphii** Blume

Ficus rumphii Blume, Bijdr. (1825) 437; Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 493; Griff., Post. Pap. 2 (1848) 111, n. 145; Ic. Pl. Asiat. 4 (1854) t. 549 (as *Ficus* spec., Bhutan); Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287; Kurz, Forest Fl. Burma 2 (1877) 448; King, Sp. Ficus 1 (1887) 54, t. 67B; in Hook.f., Fl. Brit. India 5 (1888) 512; Watt, Dict. Econ. Prod. India 3 (1890) 361; Haberlandt, Bot. Tropenreise (1893) 97; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 131; Renner, Bot. Jahrb. Syst. 39 (1907) 382; Koord., Atlas 4 (1916) t. 742; Ridl., Fl. Malay Penins. 3 (1924) 337; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 574; Gagnep., Fl. Indo-Chine 5 (1928) 768; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1014; Corner, Wayside Trees (1940) 683; M.F. Barrett, Am. Midl. Nat. 45 (1951) 175; Backer & Bakh.f., Fl. Java 2 (1965) 33; Corner, Gard. Bull. Singapore 21 (1965) 11. — *Urostigma rumphii* (Blume) Miq. in Zoll., Syst. Verz. 2 (1854) 90; Fl. Ind. Bat. 1, 2 (1859) 332.

[*Arbor conciliorum* Rumph., Herb. Amb. 3 (1743) t. 91, 92.]

Ficus religiosa L. var. β Lam., Encycl. 2, 2 (1788) 493.

Ficus cordifolia Roxb., Fl. Ind., ed. Carey 3 (1832) 548, non Blume 1825; Wight, Ic. 2 (1843) t. 640; Brandis, For. Fl. (1874) 416, t. 48. — *Urostigma cordifolium* (Roxb.) Miq., London J. Bot. 6 (1847) 564; Dalzell & A. Gibson, Bombay Fl. (1861) 242.

Ficus conciliorum Oken, Allg. Naturgesch. 3 (1841) 1561; Merr., J. Arnold Arbor. 31 (1950) 276.

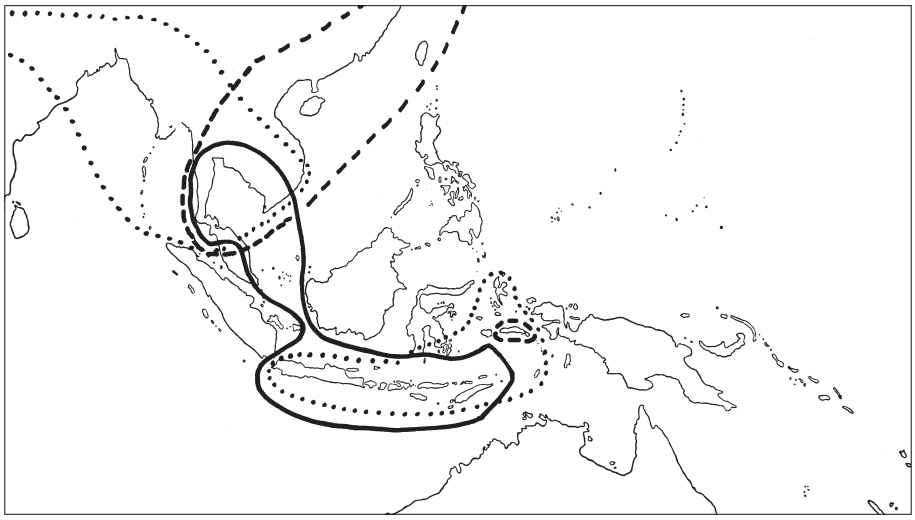
Ficus populnea Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 16, non Willd. 1806.

?*Ficus affinior* Griff., Notul. 4 (1854) 392; Ic. Pl. Asiat. 4 (1854) t. 553.

Ficus populiformis Schott ex Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287.

Ficus damit Gagnep., Notul. Syst. 4 (1927) 88; Fl. Indo-Chine 5 (1928) 812, f. 93.

Tree up to 20 m tall, 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 scars of the stipules and the bases of the petioles); 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 to subcordate to broadly cuneate, often slightly decurrent; both surfaces glabrous; cystoliths only beneath; lateral veins 6–8 pairs, the mayor basal pair up to 1/3–1/2 the length of the lamina, mostly branched, below the mayor pair always a pair of smaller basal lateral veins (unbranched or faintly branched), the other lateral veins sometimes furcate far 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, glabrous; stipules (0.5–)1–3.5 cm long, glabrous, ca-



Map 14. Distribution of some species of subg. *Urostigma* subsect. *Urostigma*: *F. rumphii* Blume (dotted lines); *F. subpisocarpa* Gagnep. (broken line); *F. superba* (Miq.) Miq. (continuous line).

ducous. *Figs* axillary or just below the leaves, in pairs (or solitary), sessile; basal bracts (2 or) 3, 1–2 mm long, glabrous, persistent; receptacle subglobose, 0.9–1.2(–1.5) cm diam. when dry and the surface often wrinkled, 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. — **Map 14.**

Distribution — India, Cocos Islands, Nicobar and Andaman Islands, Myanmar, Indochina, Thailand; in *Malesia*: Malay Peninsula, Java, Lesser Sunda Islands (Bali, Sumbawa, Timor, Alor, Wetar), Celebes (Muna Island), Moluccas (Ternate, Obi, Buru, Ceram, Ambon, Babar Islands, Banda Islands, Tanimbar Islands).

Habitat — Coastal and inland forest, often in rocky places, often coral rock; often planted.

6. **Ficus saxophila** Blume

Ficus saxophila Blume, Bijdr. (1825) 437; Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 493; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 260, 287; King, Sp. Ficus 1 (1887) 17, t. 12; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 56; Merr., Philipp. J. Sci., 1, Suppl. (1906) 47; Elmer, Leafl. Philipp. Bot. 2 (1908) 537; Koord., Atlas 4 (1916) t. 702; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 65; Ned. Ind. Blad. Diergen. 39 (1927) 263, 335; Elmer, Leafl. Philipp. Bot. 9 (1937) 3478; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 537; Backer, Blumea 6 (1948) 303; Corner, Gard. Bull. Singapore 21 (1965) 6. — *Urostigma saxophilum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 333.

Ficus petrophila Hassk., Cat. Hort. Bog. (1844) 75.

Tree, hemi-epiphytic, secondarily terrestrial, sometimes becoming buttressed trees up to c. 35 m tall. *Branches* drying red-brown to blackish. *Leafy twigs* 2–4 mm thick,

slightly angular to subterete, glabrous or (minutely) white puberulous. *Leaves* spirally arranged; lamina ovate to subovate to elliptic, 7–24 by 4–15 cm, (sub)coriaceous, apex acuminate, the acumen sharp, base cordate to rounded; both surfaces glabrous; cystoliths only beneath; lateral veins (4–)5–7 pairs, the basal pair up to 1/5–1/3 the length of the lamina, mostly branched, tertiary venation reticulate to subscalariform; waxy gland at the base of the midrib; petiole 2–4(–7) cm long, glabrous; stipules 0.3–1 cm long, glabrous or (partly as on the margin) white puberulous to subtomentose, caducous. *Figs* axillary or just below the leaves, in pairs (or solitary), sessile; basal bracts 3, 3–4.5 mm long, subtomentose or only ciliolate, persistent; receptacle subglobose, 0.5–0.8 cm diam. when dry, glabrous, red at maturity, apex convex to flat, ostiole c. 2.5 mm diam., prominent, the upper ostiolar bracts ciliolate; internal hairs absent. *Staminate flowers* near the ostiole. *Tepals* dark red. *Ovary* dark red-brown.

Distribution — Thailand, Vietnam, Christmas Island; in *Malesia*: Malay Peninsula (Langkawi), Java, Philippines (Luzon, Cebu, Negros), Celebes, Lesser Sunda Islands (Timor), New Guinea.

Habitat — Mostly coastal vegetation, often in rocky places, sometimes in forest, at low altitudes.

7. **Ficus subpisocarpa** Gagnep.

Ficus subpisocarpa Gagnep., Notul. Syst. 4 (1927) 95; Fl. Indo-China 5 (1928) 769.
Ficus superba (Miq.) Miq. var. *japonica* Miq., Prol. Fl. Jap. (1866/1867) 132; Ann. Mus. Bot. Lugd.-Bat. 2 (1865) 200; Franch. & Sav., Pl. Jap. 1 (1875) 436; Corner, Gard. Bull. Singapore 21 (1965) 7; J.C. Liao, Taxon. Rev. Moraceae Taiwan, ed. 2 (1995) 81, t. 33.

Tree up 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. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)ovate, (4–)6–13 by (1.5–)3–8 cm, (sub)coriaceous, apex (short-)acuminate, the acumen mostly blunt, base rounded to obtuse (to cuneate); both surfaces glabrous; cystoliths only beneath; lateral veins 7–10 pairs, often furcate far from the margin, the basal pair up to 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–)2.5–4.5(–7) cm long, glabrous and the epidermis often flaking off at the base of the petiole or densely minutely white hairy at the base and the epidermis persistent; stipules 0.3–0.7 (on opening shoots up to 5) cm long, sparsely or densely puberulous, caducous or subpersistent, (usually) forming a ovoid (to subglobose) terminal bud. *Figs* ramiflorous on up to 0.5 cm long curved spurs, 1–3 together; peduncle 0.1–0.7(–0.8) cm long, rather sparsely minutely puberulous to glabrous; basal bracts 3, 1–2 mm long, (sub)glabrous, caducous; receptacle subglobose to subpyriform, 0.7–1.2 cm diam. when dry and the surface wrinkled, (sub)glabrous, turning from whitish to pink (to purple or 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. — **Map 14.**

Distribution — S Japan, Ryukyu Islands, Taiwan, S China, Vietnam, Cambodia, Thailand; in *Malesia*: Malay Peninsula (Pankor Island) and Moluccas (Ceram).

Habitat — Forest or thickets, often on or among (coral) rocks, at low altitudes.

Notes — 1. The disjunct occurrence of this species in Ceram is noteworthy.

2. The species differs from *F. superba* in the smaller glabrous or inconspicuous (terminal) stipules and the shorter sparsely hairy to glabrous peduncles. Moreover, the epidermis of the base of the petiole is usually flaking off.

3. It differs from *F. caulocarpa* in the caducous bracts and exfoliation of the epidermis of the petiole only at its base.

4. The collection from Pankor Island represented a form of *F. subpisocarpa* that has to be described as subspecies, is characterized by a (minutely) hairy base of the petiole of which the epidermis does not flake off, and extends from Vietnam through Cambodia and Thailand to Peninsular Malaysia.

8. Ficus superba (Miq.) Miq.

Ficus superba (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 264, 287; King, Sp. Ficus 1 (1887) 59, t. 72; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 133; Koord., Atlas 4 (1916) t. 744; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 576; Gagnep., Fl. Indo-Chine 5 (1928) 773; Corner, Gard. Bull. Singapore 10 (1939) 287; Wayside Trees (1940) 679; Backer, Blumea 6 (1948) 308; Backer & Bakh.f., Fl. Java 2 (1965) 32; Corner, Gard. Bull. Singapore 21 (1965) 7. — *Urostigma superbum* Miq., Pl. Jungh. (1851) 46; Fl. Ind. Bat. 1, 2 (1859) 334.

Ficus tenuipes S. Moore, J. Bot. 63, Suppl. (1925) 107.

Tree up to 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 to elliptic to (sub)ovate (to lanceolate), 8–25 by 3–13.5 cm, (sub)coriaceous, apex (short-)acuminate, the acumen mostly blunt, base rounded to subcordate (or to obtuse to cuneate); both surfaces glabrous; cystoliths only beneath; lateral veins 7–10 pairs, often furcate far from the margin, the basal pair up to 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 4–10(–20) cm long, glabrous, the epidermis persistent; stipules (0.5–)0.8–1.5 (on opening shoots up to 7) cm long, densely white woolly-tomentose to -subvillous, caducous or subpersistent at the apices of the twigs and forming ovoid terminal buds. *Figs* ramiflorous on up to 1 cm long curved spurs, 1–5 together; peduncle 0.7–1.5 cm long, densely minutely puberulous; basal bracts 3, 3–5 mm long, puberulous, caducous; receptacle subglobose to subpyriform, 0.8–1.2(–1.5) cm diam. when dry and the surface wrinkled, sparsely minutely puberulous to glabrous, at maturity turning from white to pink to purple to black, 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. — **Fig. 105, 106; Map 14.**

Distribution — Indochina, Thailand; in *Malesia*: Malay Peninsula, Java, Lesser Sunda Islands (Sumba, Sumbawa, Flores, Timor), Borneo (Anambas and Natuna Islands), Celebes, Moluccas (Ceram).

Habitat — Mostly coastal forest and monsoon forest, often in rocky places, at low altitudes.

Fig. 105. *Ficus superba* (Miq.) Miq. Tree on rocks, Malaysia, Palau Chibeh, near P. Tioman. Photo E.J.H. Corner.

Fig. 106. *Ficus superba* (Miq.) Miq. Aerial root-system of tree of Fig. 105. Photo E.J.H. Corner.

Note — Two varieties recognized by Corner (1960) are excluded from the species, var. *henneana* (Miq.) Corner reinstated as an Australian species and var. *japonica* included in *F. subpisocarpa* Gagn. *Ficus geniculata* Kurz var. *abnormalis* Kurz, Forest Fl. Burma 2 (1877) 447, was also included (in var. *japonica*). It differs from *F. subpisocarpa* in the densely hairy stipules and from both *F. subpisocarpa* and *F. superba* in the persistent basal bracts. The variety recognized by Kurz is probably indeed a form of *F. geniculata*.

9. **Ficus virens** Aiton

Ficus virens Aiton, Hort. Kew. 3 (1789) 451, excl. cit. Sloane; Corner, Gard. Bull. Singapore 17 (1960) 376; 21 (1965) 9; Backer & Bakh.f., Fl. Java 2 (1965) 35; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 128, t. 7; Kochummen, Tree Fl. Malaya 3 (1978) 161; Tree Fl. Sabah & Sarawak 3 (2000) 316.

[*Handir-Alou* Rheede, Hort. Mal. 3 (1682) 77, t. 59.]

Ficus pilhasi Sm. in Rees, Cycl. 14 (1810) n. 3.

Ficus infrafoliacea Sm. in Rees, Cycl. 14 (1810) n. 31.

Ficus infectoria Roxb., Hort. Bengal. (1814) 66, excl. syn. Rheede t. 64, non Willd. 1806; Roxb., Fl. Ind., ed. Carey 3 (1832) 551; Wight, Ic. 2 (1843) t. 665; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 264; Kurz, Forest Fl. Burma 2 (1877) 446; King, Sp. Ficus 1 (1887) 60, t. 75–78; Watt, Dict. Econ. Prod. India 3 (1890) 355; K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1900) 273; Diels, Bot. Jahrb. Syst. 29 (1901) 299; F.M. Bailey, Queensl. Fl. 5 (1902) 1474; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 140; Renner, Bot. Jahrb. Syst. 39 (1907) 383; Koord., Atlas 4 (1916) t. 745; Domin, Bibl. Bot. 89 (1921) 563; Ridl., Fl. Malay Penins. 3 (1924) 337; Gagnep., Fl. Indo-Chine 5 (1928) 760; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1011; Vreede, Ann. Bot. Gard. Buitenzorg 51 (1949) 146; W.D. Francis, Austr. Rain-For. Trees (1951) 74, f. 27. — *Urostigma infectorium* Miq., London J. Bot. 6 (1847) 566; in Zoll., Syst. Verz. 2 (1854) 90; Fl. Ind. Bat. 1, 2 (1859) 339.

Ficus terminalis B. Heyne ex Roth in Roem. & Schult., Syst. Veg. 1 (1817) 513; Roth, Nov. Pl. Sp. (1821) 392.

Ficus glabella Blume, Bijdr. (1825) 452; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 265, 286; King, Sp. Ficus 1 (1887) 49, t. 60; in Hook.f., Fl. Brit. India 5 (1888) 511; Becc., For. Borneo (1902) 525; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 141; Renner, Bot. Jahrb. Syst. 39 (1907) 382; G. Karst. & Schenck, Vegetationsbilder 10 (1912) t. 21; Simon, Jahrb. Wiss. Bot. 54 (1914) 93; Koord., Atlas 4 (1916) t. 746; Merr., Enum. Born. (1921) 223; Ridl., Fl. Malay Penins. 3 (1924) 336; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 571; Gagnep., Fl. Indo-Chine 5 (1928) 759; Ochse & Bakh., Veg. Dutch East Indies (1931) 497; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1009; Corner, Wayside Trees (1940) 677; Blumea 6 (1948) 308. — *Urostigma glabellum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 340; Fl. Ind. Bat., Suppl. (1861) 437. — *Ficus virens* Aiton var. *glabella* (Blume) Corner, Gard. Bull. Singapore 17 (1960) 377.

Ficus scandens Buch.-Ham., Trans. Linn. Soc. 15 (1826) 149, non Lam. 1788.

Ficus timorensis Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 495; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287, partim, in syn. sub *F. superba*; King, Sp. Ficus 2 (1888) 185; Engl., Bot. Jahrb. Syst. 7 (1886) 451.

?*Ficus ampla* Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 18; Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 244.

Urostigma cunninghamii Miq., London J. Bot. 6 (1847) 560. — *Ficus cunninghamii* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Benth., Fl. Austral. 6 (1873) 286; F. Muell., Fragm. Phyt. Austral. 8 (1874) 246; F.M. Bailey, Queensl. Fl. 5 (1902) 1468. — *Ficus infectoria* Roxb. var. *cunninghamii* (Miq.) Domin, Bibl. Bot. 89 (1921) 562. — *Ficus lacor* Buch.-Ham. var. *cunninghamii* (Miq.) M.F. Barrett, Am. Midl. Nat. 36 (1946).

Urostigma fraseri Miq., London J. Bot. 6 (1847) 561. — *Ficus caulobotrya* Miq. var. *fraseri* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287. — *Ficus fraseri* (Miq.) F. Muell., Fragm. Phyt. Austral. 6 (1868) 195, non Miq. 1848. — *Ficus infectoria* Roxb. var. *fraseri* (Miq.) Domin, Bibl. Bot. 89 (1921) 562.

Urostigma psychotriifolium Miq., London J. Bot. 6 (1847) 561. — *Ficus psychotriifolia* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286. — *Ficus infectoria* Roxb. var. *psychotriifolia* (Miq.) Domin, Bibl. Bot. 89 (1921) 562.

Urostigma aegeirophyllum Miq., London J. Bot. 6 (1847) 565. — *Ficus infectoria* Roxb. var. *aegeirophylla* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286.

Urostigma lambertianum Miq., London J. Bot. 6 (1847) 565. — *Ficus lambertiana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286. — *Ficus infectoria* Roxb. var. *lambertiana* (Miq.) King, Sp. Ficus 1 (1887) 60, t. 75–78. — *Ficus lacor* Buch.-Ham var. *lambertiana* (Miq.) M.F. Barrett, Am. Midl. Nat. 45 (1951) 153.

Urostigma wightianum Wall. ex Miq., London J. Bot. 6 (1847) 566. — *Ficus wightiana* (Wall. ex Miq.) Benth., Fl. Hongk. (1861) 327; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286. — *Ficus infectoria* Roxb. var. *wightiana* (Wall. ex Miq.) King, Sp. Ficus 1 (1887) 60, 63, t. 75–77.

Urostigma perseifolium Miq., London J. Bot. 6 (1847) 567.

Urostigma timorense Miq., London J. Bot. 6 (1847) 569, non *F. timorensis* Decne. 1834; Miq., Fl. Ind. Bat. 1, 2 (1859) 343. — *Ficus timorensis* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286, non Decne. 1834.

Urostigma apiculatum Miq., London J. Bot. 6 (1847) 570. — *Ficus apiculata* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286, non Miq. 1854.

Urostigma canaliculatum Miq., London J. Bot. 6 (1847) 579; Fl. Ind. Bat. 1, 2 (1859) 340.

Ficus terminalioides Griff., Post. Pap. 2 (1848) n. 101; Ic. Pl. Asiat. 4 (1854) t. 550.

Urostigma moritzianum Miq. in Zoll., Syst. Verz. 2 (1854) 91, 97; Fl. Ind. Bat. 1, 2 (1859) 342.

Urostigma accedens Miq., Fl. Ind. Bat. 1, 2 (1859) 347.

Urostigma nesophilum Miq., J. Bot. Néerl. 1 (1861) 237. — *Ficus nesophila* (Miq.) F. Muell., Austral. Veg. (Intercol. Exhib. 1866/1867) n. 5 (1866) 26; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268, 286. — *Ficus glabella* Blume var. *nesophila* (Miq.) K. Schum., Fl. Schutzgeb. Südsee (1900) 273.

Ficus monticola Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 216, 286.

Ficus saxophila Blume var. *sublanceolata* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 260. — *Ficus virens* Aiton var. *sublanceolata* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 377.

Ficus glabella Blume forma *grandifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 267.

Ficus infectoria Roxb. var. *forbesii* King, Sp. Ficus 1 (1887) 63, t. 78.

Ficus syringifolia C. Fraser ex C. Moore, Handb. N.S.W. (1893) 81, non Kunth & C.D. Bouché 1847.

Ficus carolinensis Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 242; Volkens, Bot. Jahrb. Syst. 31 (1902) 462, nomen; Diels, Bot. Jahrb. Syst. 69 (1938) 398. — *Ficus prolixa* G. Forst. var. *carolinensis* (Warb.) Fosberg, Phytologia 5 (1955) 289.

Ficus nitentifolia S. Moore, J. Bot. 63, Suppl. (1925) 107.

Ficus glabella auct. non Blume: King, Sp. Ficus 1 (1887) 49.

Ficus lacor auct. non Buch.-Ham.: Rehder, J. Arnold Arbor. 10 (1929) 124; 17 (1936) 74; Summerh., J. Arnold Arbor. 22 (1941) 87; M.F. Barrett, Am. Midl. Nat. 36 (1946) 425; Specht, Rec. Am. Austral. Exp. Arnhem Land 3 (1958) 217.

Ficus lucescens auct. non Blume: Alston, Fl. Ceyl., Suppl. (1931) 268; Kandy Fl. (1938) 34, f. 181.

Tree up to 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 to oblong to ovate to elliptic (or to lanceolate), (4–)8–20 by 2.5–9 cm, (sub)coriaceous, apex acuminate,

base rounded to cuneate or to subcordate; both surfaces glabrous; cystoliths only beneath; lateral veins 7–14 pairs, the basal lateral up 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(–8) cm long, glabrous, epidermis persistent; stipules 0.3–1.5 (on opening shoots to 8) 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 (ramiflorous) on older wood on up to 0.5 cm long spurs, in pairs, solitary, or (on older wood) up to 4 together, sessile or up 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), at maturity turning from white to pink to purple to black, apex convex to flat, ostiole 1–2 mm diam., flat to ± prominent, the upper ostiolar bracts glabrous (or sparsely puberulous); internal hairs abundant, chaffy. *Staminate flowers* near the ostiole. *Tepals* reddish. *Ovary* red-brown. — **Map 13.**

Distribution — From Sri Lanka to southern China (incl. Hainan), Thailand, Vietnam, Caroline Islands, Solomon Islands, northern Australia; in *Malesia*: Malay Peninsula (and Langkawi Island), Sumatra, Java, Lesser Sunda Islands (Bali, Sumba, Sumbawa, Flores, Timor), Borneo, Philippines (Palawan), Celebes, Moluccas (Morotai, Tanimbar Islands), New Guinea (incl. New Britain).

Habitat — Coastal forest, monsoon forest, savannah forest, on cliffs, in New Guinea and Australia also in (secondary) rain forest, at altitudes up to 1700 m.

Notes — 1. This species is very variable in many characters, as in the position of the figs from axillary to ramiflorous, the shape of the lamina, the length of the petiole, and the formation of clear terminal resting buds.

2. The figs are sessile or up to 0.1 cm long pedunculate throughout Malesia, but outside this region the peduncle can be longer, up to 0.6 cm, as in Australia and India.

Section Urostigma subsection Conosycea

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Urostigma* (Gasp.) Endl. subsect. *Conosycea* (Miq.) C.C. Berg, Blumea 49 (2004) 465. — *Urostigma* Gasp. subg. *Conosycea* Miq., Fl. Ind. Bat. 1, 2 (1859) 349. — *Ficus* L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 371. — *Urostigma* Gasp. sect. *Valida* Miq., Fl. Ind. Bat. 1, 2 (1859) 334. — *Ficus* L. subg. *Urostigma* (Gasp.) Miq. ser. *Validae* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285; Corner, Gard. Bull. Singapore 17 (1960) 272.

Ficus L. sect. *Stilpnophyllum* Endl. subsect. *Sessiliflorae* Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 179, 190, 375, 376.

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Conosycea* (Miq.) C.C. Berg ser. *Drupaceae* Corner, Gard. Bull. Singapore 17 (1960) 372. — *Ficus* L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner ser. *Drupaceae* Corner subser. *Drupaceae* Corner, Gard. Bull. Singapore 17 (1960) 372.

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Conosycea* (Miq.) C.C. Berg ser. *Drupaceae* Corner subser. *Indicae* Corner, Gard. Bull. Singapore 17 (1960) 372. — *Perula* Raf., Sylv. Tellur. (1838) 59, non Schreb. 1791.

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Conosycea* (Miq.) C.C. Berg ser. *Drupaceae* Corner subser. *Zygotricheae* Corner, Gard. Bull. Singapore 17 (1960) 372.

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Conosycea* (Miq.) C.C. Berg ser. *Drupaceae* Corner subser. *Crassirameae* Corner, Gard. Bull. Singapore 17 (1960) 373.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Dictyoneuron* Corner, Gard. Bull. Singapore 17 (1960) 373.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Dictyoneuron* Corner ser. *Dubiae* Corner, Gard. Bull. Singapore 17 (1960) 373.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Dictyoneuron* Corner ser. *Glaberrimae* Corner, Gard. Bull. Singapore 17 (1960) 373.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Dictyoneuron* Corner ser. *Subvalidae* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 373. — *Urostigma* Gasp. sect. *Subvalida* Miq., Fl. Ind. Bat. 1, 2 (1859) 339.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Dictyoneuron* Corner ser. *Perforatae* Corner, Gard. Bull. Singapore 17 (1960) 374.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Benjamina* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 374. — *Ficus* L. subg. *Urostigma* (Gasp.) Miq. ser. *Benjamineae* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Conosycea* (Miq.) Corner subsect. *Benjamina* (Miq.) Corner ser. *Callophylleae* Corner, Gard. Bull. Singapore 17 (1960) 374.

Trees, without clear indication of intermittent growth. *Leafy twigs* ± angular, scars of the petioles often prominent on leafless twigs. *Leaves* spirally arranged (or subdistichous), (sub)coriaceous, mostly broadest in the middle or above the middle, the margin entire and sometimes callose (towards the base), venation scalariform to reticulate or partly to entirely parallel to the lateral veins; petiole relatively thick and short, often drying blackish; stipules often with a thickened median part. *Figs* in pairs (or solitary) in the leaf axils (or just below the leaves), more frequently sessile than pedunculate, (solitary) enclosed by calyptrate bud covers or not; receptacle large to small, often longer than wide; basal bracts large to small, often unequal (in size, shape, or presence of a thickened median part or a keel), mostly persistent; ostiole closed (the upper ostiolar bracts overlapping) or ± open (the upper ostiolar bracts not or partly imbricate), the 3 upper ostiolar bracts often unequal in size, sometimes only 2 clearly visible and the third just; internal hairs mostly absent (present in few species). *Staminate flowers* disperse. *Tepals* mostly (partly) red or reddish. *Ovary* mostly partly reddish, sometimes entirely reddish.

DISTRIBUTION

The subsection comprises 66 species. The majority (53) occur naturally in the Malesian region. Twelve species do not occur in the Malesian region, eight of them are species of the Indian Peninsula (some also occurring in Sri Lanka) and two are confined to the Sino-Himalayan region, and two, *F. humbertii* C.C. Berg and *F. menabeensis* H. Perrier are endemic to Madagascar. Four species, *F. calcicola*, *F. maclellandii*, and *F. pubilimba* found in the Malay Peninsula, and also the more widespread *F. altissima*, are essentially Sino-Himalayan extending into this area. On the other hand, thirteen essentially Malesian ones extend into the Sino-Himalayan region.

Two species, as varieties (*hillii* (F.M. Bailey) Corner and *saffordii* (Merr.) Corner) included in *F. microcarpa* (Corner 1960: 398, 399), from the Pacific and Australia, respectively, are in the present treatment regarded as distinct.

The subsection is centred in western Malesia, in the area comprising the Malay Peninsula, Sumatra and northern Borneo; each of these parts has 30–35 species, several of them occurring in the three parts. In the Philippines and Java the number of species is about 20, in all other parts of the Malesian region 10 or less. The number of species (sub)endemic to one of the areas is small, 1, 2 or 3. With only 10 species the subsection is relatively poorly represented in New Guinea, but the number of endemic species (or subspecies) is relatively high and the widespread species represented by more or less distinct forms.

The widespread species, ranging from the Asian mainland through Malesia to Australia and/or the Solomon Islands are *F. benjamina*, *F. drupacea*, and *F. microcarpa*. The disjunct range of *F. lawesii* extends from New Guinea to Peninsular India.

Most of the species are evergreen and elements of more or less humid forest, some are also found in drier types of forest, as monsoon forest, and they are often deciduous. Some species, as *F. calcicola*, *F. curtipes*, and *F. maclellandii* are often found on calcareous substrates.

MORPHOLOGY

Habit — All species are essentially hemi-epiphytic, producing more or less extensive secondary aerial root-systems from the base of the trunk, which reach the soil and form anastomosing root-baskets around stems. Others may produce few or numerous aerial roots from the branches and they may develop into pillar-roots. Some species are vigorous and may overpower host-trees, others lack that capacity. The hemi-epiphytic life form allows establishment on rocks or cliffs (as hemi-epilithic). In open places the species can be or become terrestrial.

It is often not clear from label data whether the individuals are hemi-epiphytic ('stranglers' or 'banyans') or climbers, whether they are primarily or secondarily terrestrial, and what part of the height of the tree consists of the stem and branches or of the 'stem' formed by the secondary root-system.

Label date indicate that about 50% of the species are or remain small or medium-sized trees (up to 25 m tall). The other may become tall trees up to 30 or even 40 m tall. In the first category, there are some which can be lianescent and are otherwise treelets or shrubs. The lianescent habit is predominant in *F. globosa* and *F. microsyce*.

In contrast to subsect. *Urostigma*, intermittent growth is not obviously shown in features of the branches. In some species discontinuous growth is obvious as opening-shoots have relatively long stipules (see below). Deciduousness is rare; it occurs in *F. calcicola*.

Various vegetative parts — The leafy twigs are ± clearly angular. The scars of the leaves are (rather) prominent. Petioles, and often also the stipules, are mostly drying blackish. The indumentum may consist of relatively long hairs, usually brown or brownish. In the majority of the species, the hairs are short or minute and then usually white or whitish.

Some (related) species have brown floccose indumentum or dark brown appressed pluricellular hairs on various parts.

Glabrous parts, in particular petioles and leafy twigs, are often covered with a waxy layer. In contrast to other groups in the Malesian region, the epidermis of the petiole is always persistent.

Lamina — The basic type of venation in which the tertiary venation is largely scalariform is found in few species. More common is the situation in which only towards the margin few veins run transverse and parallel from one lateral vein to another, whereas the rest of the tertiary venation is largely reticulate. The next situation is a tertiary venation which is entirely reticulate, but quite often the veins departing from the midrib start to run parallel to the lateral veins. The area in which the veins run parallel to the lateral veins expands towards the margin, and finally the whole tertiary venation is running parallel to the lateral veins. In the most extreme situation 'secondary' lateral veins are developed, showing a type of venation well-known from *F. elastica*.

Stipules — The stipules often have a thickened median part. These parts are often hairy, but the marginal parts are often glabrous. The margins of the stipules are often involute when dry. In several species, the stipules are much longer and thinner on opening-shoots than on slowly growing shoots.

Position of the figs — The figs are nearly always axillary and in pairs. In *F. lawesii*, double pairs of figs are often found in the leaf axils. In some species the figs are often or sometimes born just below the leaves.

In contrast to other groups (sections and subsections) of subg. *Urostigma*, remarkably few species have pedunculate figs. In some species, *F. dubia* (always) and *F. drupacea* (regional), the sessile figs are stipitate, a phenomenon quite unusual in the subgenus.

Protection of young figs — In species with well-developed basal bracts, these bracts provide protection, and calyptrate bud covers appear to be absent. In some species, mainly those with small and/or caducous basal bracts, single figs are often enveloped by calyptrate bud covers, sometimes up to 2.5 cm long (as in *F. cucurbitina*). They are often hairy, whereas other parts of the plant may be glabrous. The apices of these covers are round to obtuse. In *F. glaberrima*, the bud covers are small and enclose the pairs of young figs and are found on top of them after elongation of the peduncles.

Size and shape of the figs — The majority (c. 50%) of the species have receptacles of 0.5–1 cm diam. when dry, a smaller number (c. 40%) have receptacles of 1–2 cm diam. when dry. *Ficus microsyce* and *F. spathulifolia* have receptacles of up to 0.5 cm diam. when dry. For seven species the diameter of the dried receptacle ranges between 2 and 3.5 cm diameter. Receptacles which are distinctly longer than wide, ellipsoid to oblongoid (to cylindrical), are more common in this subsection than in other subdivisions of subg. *Urostigma*.

Wall of the figs — In the majority of the species the wall, in fact the outer part of the wall, is ± shrivelled. The inner and softer (parenchymatous) part is mostly separated from the outer part by a dark-coloured layer. In larger figs this may become detached from the inner part and may disintegrate, except for the upper part plug-like part, which remain smooth and attached to the inner layer of the wall. The ostiolar part is often hard and often form a rim around the ostiole.

Basal bracts — The three basal bracts are often more or less unequal as in size and shape, by having a distinct (thicker and often hairy) median part (like the stipules) and/or by being ± clearly keeled. These differences are not very consistent and difficult to use as differentiation characters.

Ostiolar bracts — The basic situation (as also found in other entities of the genus) is the presence of three upper ostiolar bracts, being imbricate and closing the entrance. In several species the entrance is closed by only two upper ostiolar bracts, the third one being smaller and covered. In other species the three upper ostiolar bracts are short and not or only partly imbricate each other and leaving narrow or wide slits through which ostiolar bracts underneath are visible. In some species, as *F. pellucidopunctata* and *F. pisocarpa*, the lower ostiolar bracts are also short and do not intercalate as normal, resulting in a channel from the entrance to the fig cavity. The shortened upper ostiolar bracts may be equal or unequal in size. Lower ostiolar bracts are sometimes placed in between the three uppermost ones and, thus, the entrance is (more or less) closed by more than three bracts. Although in most of the species the ostiole is ± open or entirely closed, in some species both states occur.

Mature figs — In the majority of the species the figs become red or reddish at maturity, in a smaller number they turn purplish (to blackish). In a minority the ripe figs are yellow(ish). The receptacle probably remains green in *F. globose*.

Internal hairs — They are mostly absent, but present in some species, always or varying from present to absent.

Staminate flowers — In contrast to subsect. *Urostigma*, they always occur near the ostiole.

Tepals — They are mostly red or reddish, rarely (almost) white. The ovaries are mostly whitish with a red, basal to lateral part, less frequently entirely red(dish).

DELIMITATION

Subsection *Conosycea* differs clearly from subsect. *Urostigma* in the absence of features related to intermittent growth, such as characteristic differences in length of the internodes, concentrations of persistent stipules (in buds) at the apices of leafy twigs, differences in colour of younger and older parts of the branches. Moreover, the leaves are not articulate or subarticulate and relatively short and thick. Internal hairs are rare and the staminate flowers are always disperse.

SUBDIVISION

Three main groups of species can be recognized:

1. *Ficus benjamina*-group (ser. *Benjamineae* Corner (1960) 374). — *Indumentum* absent or white and inconspicuous. *Lamina* small to medium-sized, often drying pale brown to greenish; tertiary venation clearly parallel to the lateral veins (and often

with secondary lateral veins, as in *F. elastica*) and slightly prominent, but clearly visible. *Figs* are small to medium sized and sessile, initially enclosed by calyptrate bud covers; basal bract often small and unequal.
The group comprises *F. archboldiana*, *F. balete*, *F. benjamina*, *F. kurzii*, *F. patellata*, *F. stricta*, and *F. subcordata*, and possibly *F. rigo*. — The species are very close. *Ficus benjamina* and *F. subcordata* are widespread, *F. kurzii* and *F. stricta* occur scattered in western Malesia and the mainland, the other species have small areas, mainly in eastern Malesia.

2. *Ficus drupacea*-group (subser. *Drupaceae*, *Indicae*, and *Zygostricheae* Corner (1960) 372). — *Indumentum* brown often conspicuous, at least on the stipules. *Lamina* large to medium-size; tertiary venation, partly (sub)scalariform or entirely reticulate, often ± prominent. *Figs* sessile or pedunculate; calyptrate bud covers enclosing young figs are common and often conspicuous; basal bracts are often small and/or caducous.
The group comprises *F. annulata***, *F. bracteata**, *F. calcicola*, *F. chrysolepis***, *F. consociata**, *F. cordatula*, *F. cucurbitina*, *F. depressa***, *F. drupacea*, *F. forstenii*, *F. globosa**, *F. kochummeniana**, *F. pubilimba*, *F. retusa**. — The indumentum of the species indicated * consists of dark brown hairs and is mostly floccose. These species constitute a distinct subgroup, like those indicated with ** and have pedunculate figs with the peduncle apically widened into a rim and bearing caducous bracts. — In contrast to the other two groups, the species can be readily distinguished. The group is centred in western Malesia.

3. *Ficus sundaica*-group (ser. *Callophylleae*, *Dubiae*, *Glaberrimae*, *Perforatae*, *Subvallidae*, and subser. *Crassirameae* Corner (1960) 373–374). — *Indumentum* inconspicuous, mostly consisting of whitish and straight hairs, or absent. *Lamina* mostly small to medium sized, mostly less than 20 cm long, sometimes longer than 20 cm; tertiary venation often partly or largely parallel to the lateral veins, often slightly prominent to flat and then often more or less (to entirely) obscure. *Figs* sessile, rarely pedunculate (*F. glaberrima*, *F. lawesii*, and sometimes in *F. microcarpa*) and small to large; basal bracts are well developed, coriaceous, and mostly about equal in size (but often different in having a thickened (and/or hairy) median part or in being keeled); they enclose the young figs.
The group comprises the majority of the Malesian species of the subsection, thus those not listed under the two other groups below. The species of this group are closely related and satisfactory delimitation of the majority of the species is rather tentative because of the absence of solid differentiating characters: most leaf characters are variable as are the size and the shape of the fig receptacle and the basal bracts. Features of the ostiole (open vs closed) are to some extent variable as well. Some species can be easily distinguished, as *F. kerkhovenii* (with weakly developed basal lateral veins), *F. lowii* (with distinct colour and structure of the lower surface of the lamina), *F. tristaniifolia* (with obscure venation of the lower surface of the lamina), or *F. subgelderi* (with distinctly hairy stipules). For practical reasons the species can be grouped according to the dimensions of the lamina. The species with laminas mostly 5–10 cm long, sometimes up to c. 15 cm long: *F. binnendijkii*,

F. borneensis, *F. delosyce*, *F. microcarpa*, *F. pallescens*, *F. soepadmoi*, *F. spathulifolia*, *F. subgelderi*, *F. sumatrana*, and *F. tristaniifolia*. Few species have large leaves (10–)20–35(–40) cm long: *F. crassiramea* and *F. xylophylla*. The rest of the species have medium-sized leaves, (5–)10–20(–c. 25) cm long.

POLLINATORS

The following genera of pollinating wasps are found in species of subsect. *Conosycea*: *Deilagaon*, *Eupristina* (*Eupristina* and *Parapristina*), *Watersoniella* (Wiebes 1994). *Platyscapa*, the genus associated with subsect. *Urostigma* is found in the Madagascan *F. menabeensis* (see Berg & Wiebes 1992). The genus *Watersoniella* appears to be associated with the *F. sundiaca*-group; other associations are not clear.

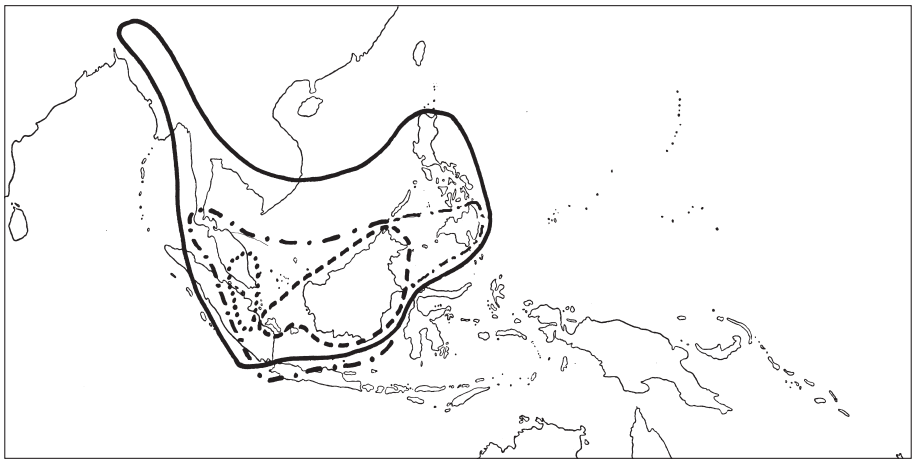
References: Berg, C.C. & J.T. Wiebes, African fig trees and fig wasps. Verh. Kon. Ned. Akad. Wet., afd. Natk., 2de reeks, 89 (1992) 1–298. — Wiebes, J.T., The Indo-Australian Agaoninae (pollinators of figs). Verh. Kon. Ned. Akad. Wet., afd. Natk., 2de reeks, 92 (1994) 1–208.

10. Ficus acamptophylla (Miq.) Miq.

Ficus acamptophylla (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 264, 287, non King, Sp. Ficus 1 (1887) 40, t. 46; quae est *F. sumatrana* var. *circumscissa* Corner; Valeton, Ic. Bog. 3 (1907) 89, t. 236; Merr., Enum. Born. (1921) 220; Corner, Gard. Bull. Singapore 21 (1965) 20; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 256. — *Urostigma acamptophyllum* Miq., Fl. Ind. Bat., Suppl. (1861) 439.
Ficus pachyphylla King, Sp. Ficus 1 (1887) 32, t. 34; Merr., Enum. Born. (1921) 225.
Ficus palungensis Weiblen, Trop. Biodiversity 5 (1998) 279.

Tree up to 15 m tall or shrub, hemi-epiphytic, sometimes a climber. *Branches* drying brown to blackish. *Leafy twigs* 2–5 mm thick, ± angular, densely to sparsely minutely white puberulous or subglabrous; periderm persistent. *Leaves* spirally arranged; lamina elliptic to obovate (or to lanceolate), 5–16 by 2–6 cm, coriaceous, apex (short-)acuminate to obtuse (to rounded), base rounded to obtuse, margin ± revolute (to almost flat); upper surface glabrous, lower surface minutely white puberulous on the midrib; midrib (at least the lower part) impressed above, lateral veins (4–)6–12 pairs, the basal pair ± to hardly distinct, up to 1/10–1/4 the length of the lamina, unbranched, 0 or 1 pairs of smaller lateral veins below the main pair, tertiary venation largely parallel to the lateral veins, slightly prominent to flat and then ± obscure beneath; waxy gland at the base of the midrib; petiole 0.5–1(–1.5) cm long, 1.5–2.5 mm thick, minutely white puberulous, drying blackish; stipules (0.5–)1–1.5(–6) cm long, minutely white puberulous (or glabrous), caducous (or subpersistent). *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 3–5 mm long, (sub)equal, often weakly keeled, minutely white puberulous, persistent; receptacle subglobose to ovoid, (0.5–)0.7–1.2 cm diam. when dry, sparsely minutely white puberulous to glabrous, red to black at maturity, apex convex to submammillate, ostiole 2–3 mm diam., ± prominent (to conical) to flat, slightly open (or closed), the 3 upper ostiolar bracts not or partly (or fully) imbricate; wall ± shrivelled (to ribbed) towards the apex when dry; internal hairs absent. *Tepals* red. *Ovary* partly red. — **Fig. 107, 108a–i; Map 15.**

Distribution — *Malesia*: Sumatra (incl. Banka), Borneo.



Map 15. Distribution of some species of subg. *Urostigma* subsect. *Conosycea*: *F. acamptophylla* (Miq.) Miq. (broken line); *F. microsyce* Ridl. (dotted line); *F. pellucidopunctata* Griff. (continuous line); *F. pisocarpa* Blume (dot-dash line).

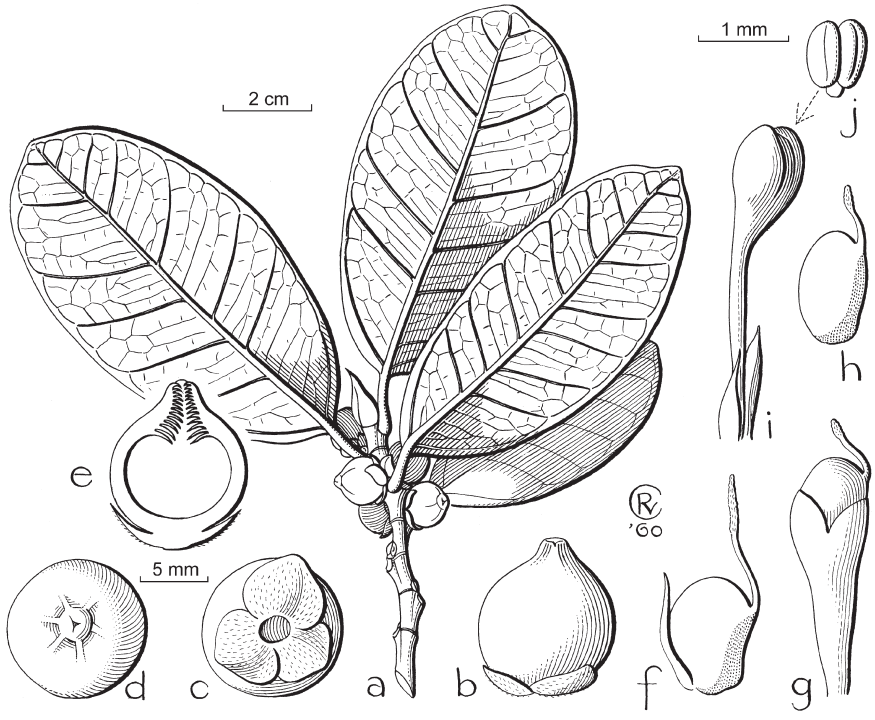


Fig. 107. *Ficus acamptophylla* (Miq.) Miq. a. Leafy twig with figs; b. fig; c. basal bracts, d, e. ostiole; f. long-styled flowers; g. short-styled flower, h. pistil of long-styled flower; i. staminate flower and interfloral bracts; j. stamen (a: *Purseglove 5058*; b–j: *Korthals s.n.*).

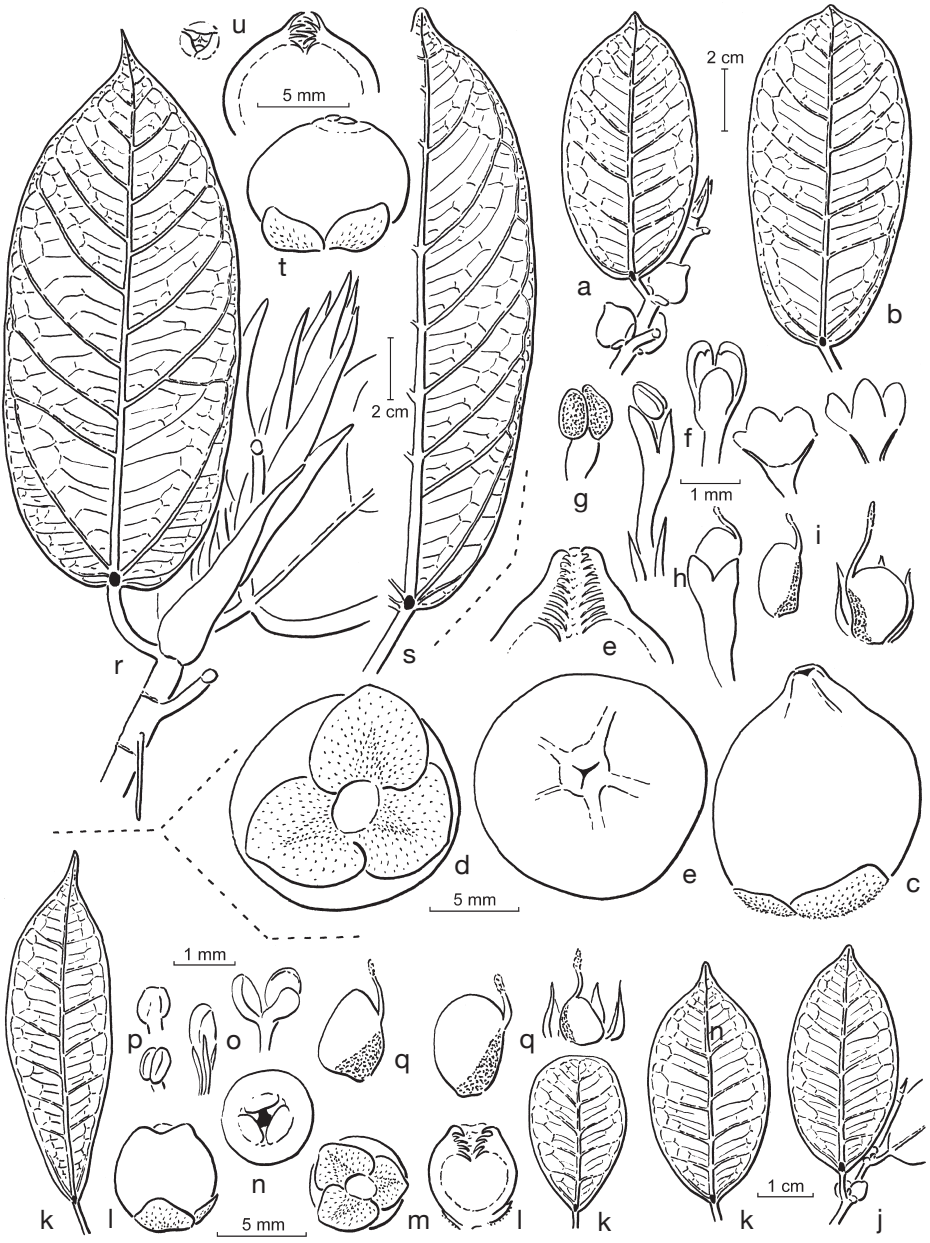


Fig. 108. a–i: *Ficus acamptophylla* (Miq.) Miq. a. Leafy twigs with figs; b. leaf; c. fig; d. basal bracts; e. ostioles: f. staminate flowers and perianths; g. stamen; h. short-styled flowers; i. long-styled flowers. — j–q: *Ficus microcarpa* L.f. j. Leafy twig with figs; k. leaves; l. figs; m. basal bracts, n. ostiole; o. staminate flower and perianth; p. stamens; q. long-styled flower and pistils. — r–u: *Ficus paracamptophylla* Corner. r. Leafy twig with leaves and subpersistent stipules; s. leaf; t. fig; u. ostioles (all: collections used unknown). From Philos. Trans., Ser. B, 273 (1976) 363.

Habitat — Forest, often swamp forest or on sea-coasts, at low altitudes.

Note — In Sumatra, the fig receptacle is small (0.5–0.7 cm diam.) and the basal bracts are small as well (c. 2 mm long).

11. **Ficus altissima** Blume

Ficus altissima Blume, Bijdr. (1825) 444; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 262, 285; Kurz, Forest Fl. Burma 2 (1877) 442; King, Sp. Ficus 1 (1887) 30, t. 30; Fl. Brit. India 5 (1888) 504; Watt, Dict. Econ. Prod. India 3 (1890) 342; Koord., Versl. Minahassa (1898) 596; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 457; Merr., Bull. Bur. For. Philipp. 1 (1903) 17; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 85; Elmer, Leafl. Philipp. Bot. 4 (1911) 1243; Koord., Atlas Baumart. Java 4 (1916) t. 715–717; Merr., Enum. Born. (1921) 220; Enum. Philipp. Flow. Pl. 2 (1923) 44; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 567; Gagnep., Fl. Indo-Chine 5 (1928) 780; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1003; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 209; M.F. Barrett, Bull. Torrey Bot. Club 72 (1945) 394, f. 1; Backer & Bakh.f., Fl. Java 2 (1965) 31; Corner, Gard. Bull. Singapore 21 (1965) 15. — *Urostigma altissimum* (Blume) Miq. in Zoll., Syst. Verz. 2 (1854) 90; Fl. Ind. Bat. 1, 2 (1859) 349.

Ficus laccifera Roxb., Fl. Ind., ed. Carey 3 (1832) 545; Wight, Ic. 2 (1843) t. 656; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Kurz, Forest Fl. Burma 2 (1877) 441. — *Urostigma lacciferum* (Roxb.) Miq., London J. Bot. 6 (1847) 575.

Ficus latifolia Oken, Allg. Naturgesch. 3 (1841) 1563, non Salisb. Prodr. 1796: 16, nom. illeg. (see Code Art. 62, examples); Merr., J. Arnold Arbor. 31 (1950) 276.

Tree up to 40 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown. *Leafy twigs* 5–7 mm thick, ± angular, minutely whitish puberulous to glabrous; periderm persistent. *Leaves* spirally arranged; lamina elliptic to ovate (or to oblong), (8–)10–22(–38) by 6–13(–24) cm, coriaceous, apex short-acuminate, base (sub)-attenuate to rounded; both surfaces glabrous; midrib slightly prominent to flat above, lateral veins 7–10(–12) pairs, the basal pair ± distinct, up to (1/6–)1/4–1/3(–1/2) the length of the lamina, branched, straight or slightly curved, 0 or 1 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, drying brown to blackish; stipules 2–4 cm long, densely whitish puberulous, caducous. *Figs* axillary, paired (or solitary), initially in up to 1.5 cm long puberulous calyptrate bud covers, sessile; basal bracts (2 or) 3, 1–3 mm long, unequal in size, often connate, forming a lobate to subentire ring, minutely puberulous, persistent; receptacle ellipsoid, 1–1.5(–2) cm diam. when dry, glabrous, red at maturity, apex convex to submammillate, ostiole c. 2.5 mm diam., ± prominent, open, the 3 upper ostiolar bracts subequal to unequal, slightly or not imbricate, rather thick; wall ± shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

Distribution — India to S China, Myanmar, Indochina, Thailand, Andaman Islands; in *Malesia*: Sumatra, Malay Peninsula, Java, Philippines (Luzon, Mindoro, Mindanao), Celebes.

Habitat — Forest, at altitudes up to 1700 m.

12. **Ficus annulata** Blume

Ficus annulata Blume, Bijdr. (1825) 448; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 261, 262, 285; Kurz, Forest Fl. Burma 2 (1877) 443; Boerl., Bijdr. Fl. Sum. (1884) 32; King, Sp. Ficus 1 (1887)

25, t. 22, 23; Fl. Brit. India 5 (1888) 502; Koord., Versl. Minahassa (1898) 596; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) t. 708, 709; Merr., Enum. Born. (1921) 220; Ridl., Fl. Malay Penins. 3 (1924) 333; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 568; Gagnep., Fl. Indo-Chine 5 (1928) 783; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1004; Corner, Wayside Trees (1940) 674, f. 251; Backer & Bakh.f., Fl. Java 2 (1965) 31; Corner, Gard. Bull. Singapore 25 (1965) 12; Kochummen, Tree Fl. Malaya 3 (1978) 140; Tree Fl. Sabah & Sarawak (2000) 230. — *Urostigma annulatum* (Blume) Miq. in Zoll., Syst. Verz. 2 (1854) 90; Fl. Ind. Bat. 1, 2 (1859) 352; Fl. Ind. Bat., Suppl. (1861) 440.

Ficus flavescens Blume, Bijdr. (1825) 449. — *Urostigma flavescens* (Blume) Miq., Pl. Jungh. (1851) 48; Fl. Ind. Bat. 1, 2 (1859) 335; Fl. Ind. Bat., Suppl. (1861) 436. — *Ficus annulata* Blume var. *flavescens* (Blume) King, Sp. Ficus 1 (1887) 26.

Ficus valida Blume, Bijdr. (1825) 449; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 262, 285. — *Urostigma validum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 336; Fl. Ind. Bat., Suppl. (1861) 437. — *Ficus annulata* Blume var. *valida* (Blume) King, Sp. Ficus 1 (1887) 26.

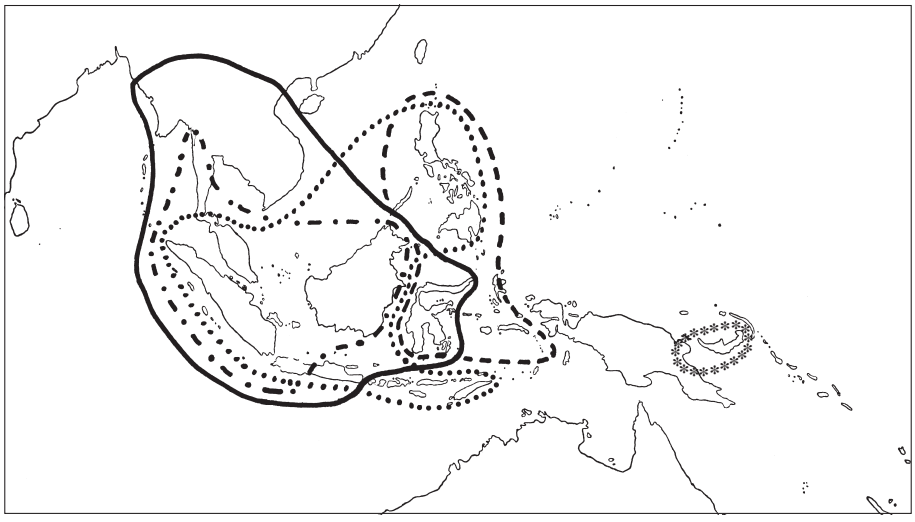
Urostigma conocarpum Miq., Fl. Ind. Bat. 1, 2 (1859) 350

Urostigma biverrucellum Miq., Fl. Ind. Bat., Suppl. (1861) 436. — *Ficus annulata* Blume var. *biverrucella* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 261.

Ficus annulata Blume var. *elliptica* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 262.

Ficus balabacensis Quisumb., Philipp. J. Sci. 41 (1930) 316, t. 1; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 211.

Tree up 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 scars of the stipules). *Leaves* spirally arranged; lamina oblong to subobovate to elliptic (or to 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 mid-



Map 16. Distribution of some species of subg. *Urostigma* subsect. *Conosycea*: *F. annulata* Blume (continuous line); *F. chrysolepis* Miq. subsp. *chrysolepis* (broken line); *F. chrysolepis* Miq. subsp. *novoguineensis* (Corner) C.C. Berg (*** line); *F. depressa* Blume (dotted line); *F. globosa* Blume (dot-dash line).

rib), lower surface glabrous (or brownish puberulous on the (main) veins); cystoliths on both sides; midrib flat, lateral veins (8–)12–20 pairs, the basal pair hardly distinct, up to 1/20–1/10 the length of the lamina, unbranched, 0 or 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(–7.5) cm long, glabrous (or brownish subsericeous), caducous (or subpersistent). *Figs* axillary, in pairs (or solitary), with a peduncle to 1(–2) cm long or sessile, the peduncle widened into an annular rim; basal bracts 3, inserted inside the rim of the peduncle, 3–10 mm long, subequal, (sparsely) brownish puberulous or glabrous, caducous at maturity; receptacle ellipsoid to ovoid (to subglobose), 2–3 cm diam. when dry, glabrous or puberulous near the ostiole, 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. — **Map 16.**

Distribution — Myanmar, S China (Yunnan), Indochina, Thailand; in *Malesia*: Sumatra (incl. Banka), Malay Peninsula, Java, Borneo, Philippines (Balabac Island), Celebes.

Habitat — Forest, often along rivers, at altitudes up to 1000 m.

Notes — 1. The upper ostiolar bracts are thick, not imbricate, and equal or unequal in size. The apices of some of the thick bracts just underneath the upper ones often rise in the space left open by the uppermost bracts.

2. The lamina, petiole, and stipules are usually glabrous, but sometimes hairy (in Borneo and Sumatra).

3. There are often small holes in the wall of the receptacle (caused by (breeding) parasites?). Similar holes are also found in *F. chrysolepis*.

4. In dry material, the outer layer of the fig wall becoming easily detached from the inner one.

5. The differences between *F. annulata* and *F. chrysolepis* are small. They could be merged and three (largely allopatric) subspecies established.

13. Ficus archboldiana Summerh.

Ficus archboldiana Summerh., J. Arnold Arbor. 22 (1941) 84; Corner, Gard. Bull. Singapore 21 (1965) 24.

Ficus retusa L. var. *papuana* Diels, Bot. Jahrb. Syst. 67 (1935) 183.

Tree up to 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to blackish. *Leafy twigs* 2–4 mm thick, ± angular, glabrous; periderm persistent. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)ovate, 6–11 by 3–6 cm, coriaceous, apex (sub)acuminate, base rounded to cuneate (to subattenuate), margin flat; both surfaces glabrous; midrib (almost) flat, lateral veins 10–14 pairs, the basal pair slightly or not distinct, up 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 1.5–4 cm long, 2–3 mm thick, glabrous, drying blackish; stipules 1.5–3 cm long, glabrous,

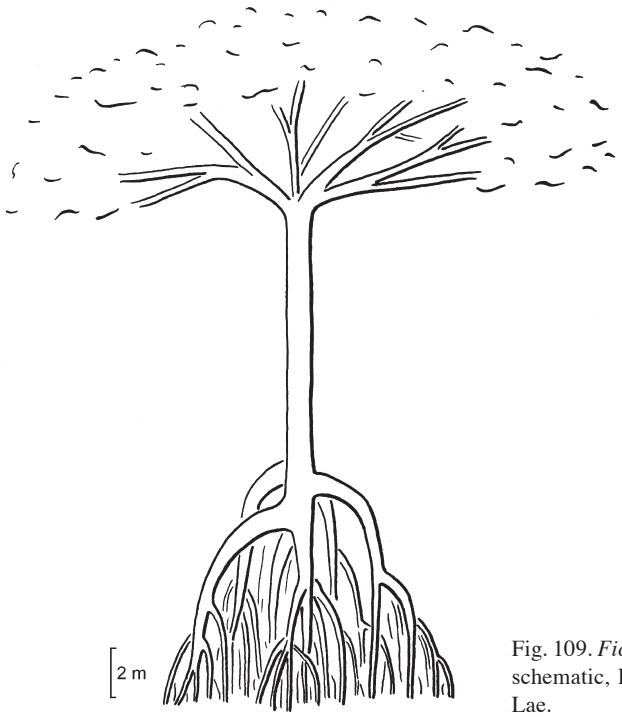


Fig. 109. *Ficus archboldiana* Summerh. Habit, schematic, Papua New Guinea, Oomsis, near Lae.

drying blackish, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 5–8 mm long, subequal, glabrous, persistent; receptacle subglobose, 1–1.5 cm diam. when dry, glabrous, yellow to red to purple at maturity, apex convex, ostiole 3–4 mm diam., flat, closed, the 3 upper ostiolar bracts fully imbricate; wall almost smooth when dry; internal hairs absent. *Tepals* red. *Ovary* reddish. — **Fig. 109, 110a–g.**

Distribution — *Malesia*: New Guinea (eastern).

Habitat — Forest, at low altitudes.

14. Ficus balete Merr.

Ficus balete Merr., Philipp. J. Sci. 18 (1921) 55; Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 187; Corner, Gard. Bull. Singapore 21 (1965) 23.

Tree up to 15 (or more?) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown. *Leafy twigs* 2–4 mm thick, ± angular to subterete, glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic, 7–15 by 4–9 cm, coriaceous, apex short-acuminate to subacute, base obtuse to rounded, margin flat or ± revolute towards the base; both surfaces glabrous; midrib slightly prominent to flat above, lateral veins 8–11 pairs, the basal pair ± distinct, up to 1/6–1/4 the length of the lamina, unbranched, tertiary largely parallel to the lateral veins; waxy gland at the base of the midrib; petiole 1.5–3.5 cm long, 2–3 mm thick, glabrous, drying blackish to brown; stipules 1.5–2.5(–3) cm long, glabrous, caducous. *Figs* axillary, paired (or

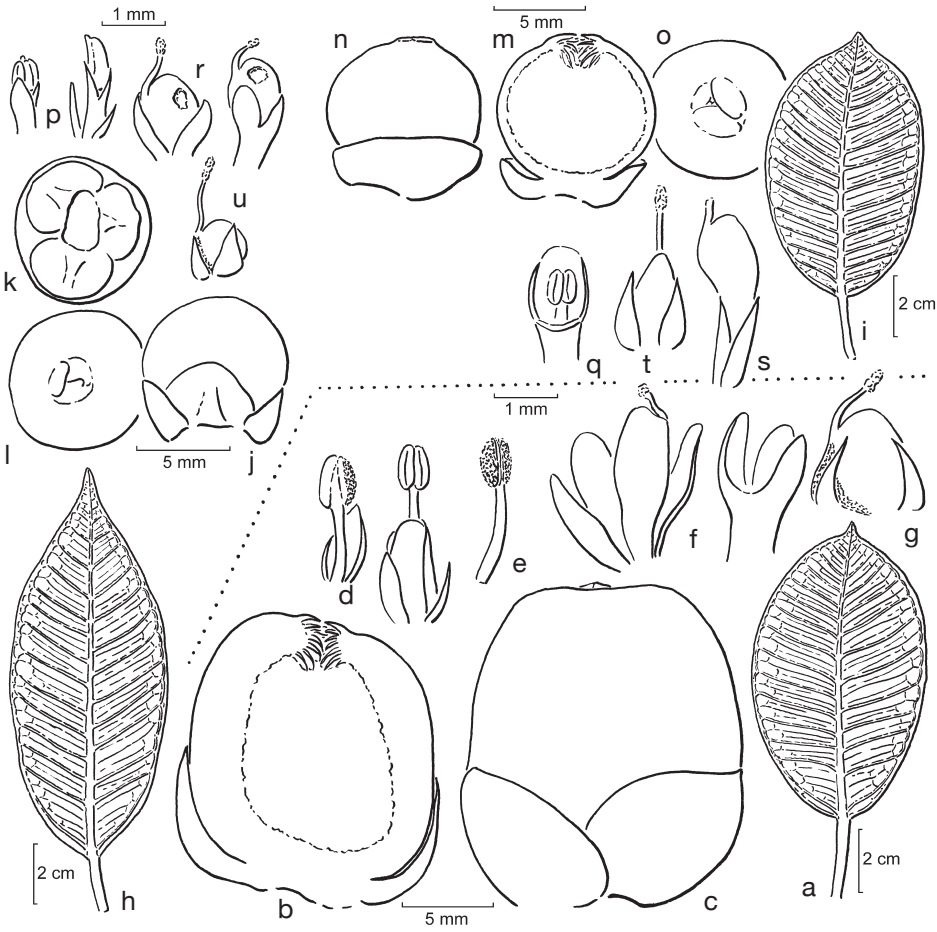


Fig. 110. a–g: *Ficus archboldiana* Summerh. a. Leaf; b. fig; c. basal bracts; d. staminate flowers; e. stamen; f. short-styled flower and perianth; g. long-styled flower. — h–u: *Ficus patellata* Corner. h, i. Leaves; j, m. figs; k. basal bracts (free); l, o. ostiole; n. basal bracts (connate); p, q. staminate flowers; r. short-styled flowers with opened 'gall-fruits'; s. short-styled flower; t, u. long-styled flowers (a: *Ledermann 8033a*; b–g: *Carr 12778*; h, j–l, p, r, u: *Carr 12092*; i, m–o, q, s, t: *Aet 141*). From Philos. Trans., Ser. B, 281 (1978) 365.

solitary); peduncle 0.5–1.2 cm long; basal bracts 3, 5–7 mm long, (sub)equal, glabrous or sparsely and minutely puberulous, persistent; receptacle ellipsoid to ovoid, 1.2–1.8 cm diam. when dry, glabrous, deep red at maturity, apex slightly convex to flat, ostiole 2–2.5 mm diam., (almost) flat, open, the 3 upper ostiolar bracts not or partly imbricate, numerous ostiolar bracts underneath visible; wall ± shrivelled when dry; internal bristles absent. *Tepals* reddish. *Ovary* reddish. — **Fig. 111.**

Distribution — *Malesia*: Philippines.

Habitat — Forest, at low altitudes.

Note — This species shows close affinities to *F. archboldiana*.

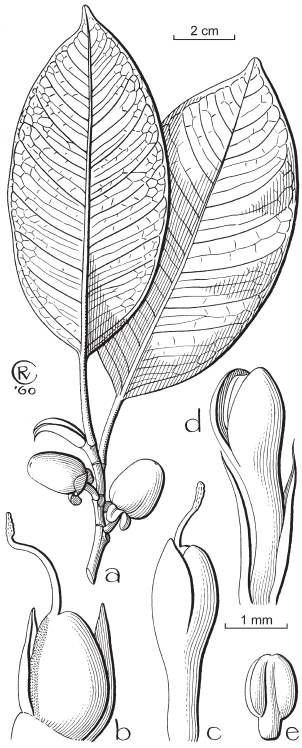


Fig. 111. *Ficus balete* Merr. a. Leafy twig with figs; b. long-styled flower, c. short-styled flower; d. staminate flower and interfloral bracts; e. stamen (a: *Pancho 552*; b–e: *Bur. Sci. 31516*).

15. Ficus benghalensis L.

Ficus benghalensis L., Sp. Pl. (1753) 1059; Amoen. 3, 1 (1785) 29, n. 10; Burm.f., Fl. Ind. (1768) 494; Vahl, Enum. Pl. 2 (1805) 187; Willd., Sp. Pl. 4 (1806) 1135; Link, Enum. Hort. Berol. 2 (1822) 449; Kunth, Ann. Sci. Nat. Bot., Sér 3, 7 (1847) 242; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285; Kurz, Forest Fl. Burma 2 (1877) 440; King, Sp. Ficus 1 (1887) 18, t. 13; Fl. Brit. India 5 (1888) 499; Watt, Dict. Econ. Prod. India 3 (1890) 343; Trimen, Fl. Ceyl. 4 (1898) 86; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 60; Renner, Bot. Jahrb. Syst. 39 (1907) 380; G. Karst. & Schenck, Vegetationsbilder 10 (1912) t. 19, 20; Koord., Atlas Baumart. Java 4 (1916) t. 703; Rock, Orn. Trees Hawaii (1917) t. 28; Ridl., Fl. Malay Penins. 3 (1924) 331; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1004; Corner, Wayside Trees (1940) 675, t. 206; M.F. Barrett, Bull. Torrey Bot. Club 72 (1945) 394; Anonymous, Wealth of India 4 (1956) 24, f. 9; Worth., Ceylon Trees (1959) f. 402; Corner, Gard. Bull. Singapore 17 (1960) 381; Backer & Bakh.f., Fl. Java 2 (1965) 34; Corner, Gard. Bull. Singapore 21 (1965) 14; Rev. Handbook Fl. Ceyl., 1, 2 (1977) 136, t. 13. — *Perula benghalensis* (L.) Raf., Sylv. Tellur. (1838) 59. — *Urostigma benghalense* (L.) Gasp., Giorn. Bot. Ital. 2 (1844) 215; Rendiconti Reale Accad. Sci. Fis. 25 (1845) 82; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 344; Ric. Caprif. (1845) 82, t. 7, f. 14–21; Miq., London J. Bot. 6 (1847) 571; Fl. Ind. Bat. 1, 2 (1859) 352.

[*Peralu* Rheede, Hort. Mal. 1 (1678) 49, t. 28.]

Ficus indica L., Sp. Pl. (1753) 1060; emend. Lam., Encycl. 2, 2 (1788) 494; Sm. in Rees, Cycl. 14 (1810) Ficus n. 41; Roxb., Hort. Bengal. (1814) 65; Buch.-Ham., Trans. Linn. Soc. 13 (1822) 489; Roxb., Fl. Ind., ed. Carey 3 (1832) 539; Hook., J. Bot. (Hooker) 3 (1841) 287, t. 13, 14; Wight, Ic. 6 (1853) t. 1989.

Ficus umbrosa Salisb., Prodr. Stirp. Chap. Allerton (1796) 16.
Ficus cotoneifolia Vahl, Enum. Pl. 2 (1805) 189; Stokes, Bot. Mat. Med. 4 (1812) 355.
Ficus lasiophylla Link, Enum. Hort. Berol. 2 (1822) 449.
Ficus banyana Oken, Allg. Naturgesch. 3 (1841) 1561; Merr., J. Arnold Arbor. 31 (1950) 276.
Ficus crassinervia Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 17, nom. inval. in synon. — *Ficus umbrifera* Kunth & C.D. Bouché, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 243, non Desf. ex Willd. 1806.
Ficus chauvieri G. Nicholson, Ill. Dict. Gard. 2 (1885) 12.
Ficus krishnae C.DC., Bull. Herb. Boiss., Sér. 2, 2 (1902) 760; Bot. Mag. (1906) t. 8092; Biswas, Current Sci. 3 (1935) 424, f. 1–3; Puri, J. Roy. Asiat. Soc. Bengal. 12 (1946) 7; Anonymous, Wealth of India 4 (1956) 26, f. 10. — *Ficus benghalensis* L. var. *krishnae* (C.DC.) Corner, Gard. Bull. Singapore 21 (1965) 14.

Tree up to 20 (or more) m tall, (in cultivation) terrestrial. *Branches* drying greyish to brown. *Leafy twigs* 5–10 mm thick, ± angular, whitish puberulous; periderm persistent or flaking off. *Leaves* spirally arranged; 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 flat above, lateral veins 5 or 6 pairs, the basal pair distinct, up to 1/3–1/2 the length 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 up to 1 cm long calyptrate bud covers; 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.

Distribution — Pakistan and India; widely cultivated, also in Malesia.

Notes — 1. This species 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.

2. *Ficus indica* auct. non L. (1753): King, Sp. Ficus 1 (1887) 39, 40 is not *F. benghalensis* but a mixture of other species.

16. Ficus benjamina L.

Ficus benjamina L., Mant. 1 (1767) 129; Lam., Encycl. 2, 2 (1788) 493; Blume, Bijdr. (1825) 456; Rumphia 2 (1836) 17, 18 t. 71; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 267, 288; Benth., Fl. Austral. 6 (1873) 167; Kurz, Forest Fl. Burma 2 (1877) 446; Náves & Fern.-Vill., Nov. App. (1880) 199; S. Vidal, Sin. Atl. (1883) 39, t. 87B; Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 251; King, Sp. Ficus 1 (1887) 43, t. 52; Fl. Brit. India 5 (1888) 508; Watt, Dict. Econ. Prod. India 3 (1890) 346; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 457; F.M. Bailey, Queensl. Agr. J. 7 (1900) 349, t. 45, var. *lehuntei* F.M. Bailey (pro fol., cf. note); K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1900) 272; Becc., For. Borneo (1902) 583; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 118; Elmer, Leafl. Philipp. Bot. 1 (1907) 48; Merr., Philipp. J. Sci., 1, Suppl. (1906) 46; Renner, Bot. Jahrb. Syst. 39 (1907) 381; Merr., Fl. Manila (1912) 46; Koord., Atlas Baumart. Java 4 (1916) t. 735; Rock, Orn. Trees Hawaii (1917) t. 29; Merr., Enum. Born. (1921) 221; Enum.

Philipp. Flow. Pl. 2 (1923) 46; Ridl., Fl. Malay Penins. 3 (1924) 336; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 568; Gagnep., Fl. Indo-Chine 5 (1928) 766; Summerh., J. Arnold Arbor. 10 (1929) 146; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1004; Diels, Bot. Jahrb. Syst. 67 (1935) 184; Elmer, Leafl. Philipp. Bot. 9 (1937) 3456; Corner, Wayside Trees (1940) 675, t. 207; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 195; M.F. Barrett, Am. Midl. Nat. 45 (1951) 118; Worth., Ceylon Trees (1959) f. 403; Backer & Bakh.f., Fl. Java 2 (1965) 24; Corner, Gard. Bull. Singapore 21 (1965) 21; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 139, t. 15; Kochummen, Tree Fl. Malaya 3 (1978) 141; Tree Fl. Sabah & Sarawak 3 (2000) 262. — *Urostigma benjaminum* (L.) Miq., London J. Bot. 6 (1847) 583; Pl. Jungh. (1851) 50; Fl. Ind. Bat. 1, 2 (1859) 346; Fl. Ind. Bat., Suppl. (1861) 439; Dalzell & A. Gibson, Bombay Fl. (1861) 242.

[*Itty-alu* Rheede, Hort. Mal. 1 (1678) 25, t. 26.]

Ficus nitida Thunb., Diss. Fic. (1786) 5, 11, 15; Willd., Sp. Pl. 4 (1806) 1145.

Ficus pyrifolia Salisb., Prodr. Stirp. Chap. Allerton (1796) 16, non Burm.f. 1768, nec Lam. 1788.

Ficus comosa Roxb., Pl. Coromandel 2 (1799) 14, t. 125. — *Ficus benjamina* L. var. *comosa* (Roxb.) Kurz, Forest Fl. Burma 2 (1877) 446; King, Sp. Ficus 1 (1887) 44, t. 52B; M.F. Barrett, Am. Midl. Nat. 45 (1951) 125.

Ficus striata Roth in Roem. & Schult., Syst. Veg. 1 (1817) 507.

Ficus pendula Link, Enum. Hort. Berol. 2 (1822) 450; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 251.

Ficus reclinata Desf., Cat. Hort. Paris, ed. 3 (1829) 412.

Ficus haematocarpa Blume ex Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 494; Engl., Bot. Jahrb. Syst. 7 (1886) 452. — *Urostigma haematocarpum* (Blume ex Decne.) Miq., London J. Bot. 6 (1847) 584; Fl. Ind. Bat. 1, 2 (1859) 346. — *Ficus benjamina* L. var. *haematocarpa* (Blume ex Decne.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 288.

Ficus neglecta Blume ex Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3 (1834) 494; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 288. — *Urostigma neglectum* (Blume ex Decne.) Miq., Fl. Ind. Bat. 1, 2 (1859) 347.

Ficus parvifolia Oken, Allg. Naturgesch. 3 (1841) 1562; Merr., J. Arnold Arbor. 31 (1950) 276.

Urostigma nudum Miq., London J. Bot. 6 (1847) 584; Fl. Ind. Bat. 1, 2 (1859) 349; Fl. Ind. Bat., Suppl. (1861) 439. — *Urostigma benjaminum* (L.) Miq. var. *nudum* Miq., Pl. Jungh. (1851) 50. — *Ficus nuda* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 267, 288; Kurz, Forest Fl. Burma 2 (1877) 445; Náves & Fern.-Vill., Nov. App. (1880) 200; S. Vidal, Phan. Cuming. (1885) 146; Rev. Pl. Vasc. Filip. (1886) 251; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 59; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 196. — *Ficus benjamina* L. var. *nuda* (Miq.) M.F. Barrett, Am. Midl. Nat. 45 (1951) 127, 128; Corner, Gard. Bull. Singapore 21 (1965) 21.

Ficus papyrifera Griff., Itin. Pl. Khasyah Mts (1848) 101; Notul. Pl. Asiat. 4 (1854) 394; Ic. Pl. Asiat. 4 (1854) t. 554-II.

Ficus umbrina Elmer, Leafl. Philipp. Bot. 1 (1907) 49; 4 (1911) 1245; 7 (1914) 2409.

Ficus cuspidatocaudata Hayata, Ic. Pl. Formos. 8 (1919) 119, f. 43; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 21.

Ficus xavieri Merr., Philipp. J. Sci. 20 (1922) 369; Enum. Philipp. Flow. Pl. 2 (1923) 69; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 197.

Ficus benjamina L. forma *warringiana* M.F. Barrett, Am. Midl. Nat. 45 (1951) 118.

Ficus benjamina L. var. *bracteata* Corner, Gard. Bull. Singapore 17 (1960) 396; 21 (1965) 21.

Ficus nepalensis auct. non Spreng.: Blanco, Fl. Filip., ed. 2 (1845) 474.

Tree up to 35 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish to blackish. *Leafy twigs* 1–2(–3) mm thick, ± angular to subterete, glabrous (or minutely white puberulous); periderm often flaking off. *Leaves* spirally arranged to subdistichous; lamina elliptic to oblong to (sub)ovate, 2–14 by 1.5–6(–8) cm, coriaceous, apex (sub)acuminate, base rounded to obtuse (to cuneate to subattenuate), margin flat, often callose towards the base; both surfaces glabrous; midrib (almost)

flat, lateral veins 6–12(–16) pairs, the basal pair ± to hardly distinct, up to 1/10–1/5 (–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, drying pale brown; stipules 0.5–1.5(–2) cm long, glabrous (or minutely white puberulous), drying often pale brown to straw-coloured, sometimes darker brown (to blackish), caducous, often involute when dry. *Figs* axillary, paired (or solitary), sometimes initially enclosed by up to 0.3 cm long calyptrate bud covers, sessile; basal bracts 3, 0.5–3 mm long, unequal (or subequal), glabrous or occasionally white puberulous, persistent; receptacle subglobose to ellipsoid to obovoid (and substipitate) or to subpyriform, 0.5–1(–1.5) 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., flat or slightly prominent by a low rim, ± open or closed, the upper ostiolar bracts usually not fully (or sometimes fully) imbricate, occasionally minutely puberulous; wall ± shrivelled (to ribbed) to almost smooth (or pustulate) when dry; internal hairs absent. *Tepals* (partly) red. *Ovary* partly red to whitish.

Distribution — India, Myanmar, Thailand, S China, Indochina to Australia (Arnhem Land and Queensland), Solomon Islands; in *Malesia*: throughout.

Habitat — Forest, at altitudes up to 1300 m; often in secondary growth or planted.

Notes — 1. The species is rather variable, as in the dimensions of leaves and figs, and the colour of dried stipules, petioles, and fig receptacles, which is mostly pale brown (straw-coloured), but mainly in the eastern part of the species range often darker, sometimes even blackish. The fig receptacle is usually 0.4–1 cm diam. when dry, but it is sometimes up to 1.5 cm diameter. The basal bracts are mostly 0.5–2 mm long and mostly concealed, but sometimes up to 2–3 mm and then not concealed. The ostiolar bracts are not fully imbricate, but in some parts of the species range, as in the Philippines and Celebes, the ostiole is closed. Collection *FRI 5837* from Peninsular Malaysia is unusual in the presence of hairs on the basal and outer ostiolar bracts.

2. Two species are closely related to *F. benjamina* and often mixed up with material of this species: *F. stricta* and *F. kurzii*. The former is distinct in the larger basal bracts and longer stipules and the latter mainly by the slightly prominent midrib of the lamina above.

17. Ficus binnendijkii (Miq.) Miq.

Ficus binnendijkii (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 288; King, Sp. Ficus 1 (1887) 41, t. 47; Boerl., Handl. Fl. Ned. Ind. 3 (1900) 363; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 109; Renner, Bot. Jahrb. Syst. 39 (1907) 381; Koord., Atlas Baumart. Java 4 (1916) t. 730; Merr., Enum. Born. (1921) 221; Ridl., Fl. Malay Penins. 3 (1924) 336; Backer & Bakh.f., Fl. Java 2 (1965) 24, 35; Corner, Gard. Bull. Singapore 21 (1965) 20; Kochummen, Tree Fl. Malaya 3 (1978) 141; Tree Fl. Sabah & Sarawak 3 (2000) 227. — *Urostigma binnendijkii* Miq., Fl. Ind. Bat. 1, 2 (1859) 341.

Urostigma peracutum Miq., Fl. Ind. Bat. 1, 2 (1859) 343. — *Ficus peracuta* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 306.

Ficus ngii Kochummen, Gard. Bull. Singapore 50 (1998) 209.

Ficus pruniformis auct. non Blume: Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 266, 286 pro. syn. — *Urostigma peracutum* Miq.: King, Sp. Ficus 1 (1887) 24, 25.

Tree up to 10 (or more?) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* c. 2 mm thick, ± angular, glabrous; periderm persistent or ± flaking off. *Leaves* spirally arranged; lamina oblong to elliptic or to lanceolate (to linear), 3–15(–24) by 1–5 cm, coriaceous, apex acuminate, base obtuse to rounded, margin flat or slightly revolute towards the base; both surfaces glabrous; midrib (at least the lower part) ± impressed above, lateral veins 6–10(–14) pairs, the basal pair ± distinct, up to 1/10–1/4 the length of the lamina, unbranched, without smaller lateral veins below the (main) pair, tertiary largely parallel to the lateral veins, ± 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 up to 0.8 cm long puberulous calyptrate bud covers; basal bracts 3, 1–2 mm long, (sub)equal to ± 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, ± open, the 3 upper ostiolar bracts not or partly imbricate; wall smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

Distribution — *Malesia*: Sumatra, Malay Peninsula, Java, Borneo.

Habitat — Forest, at altitudes up to 1000 m.

Notes — 1. This species shows similarities to *F. pallescens*, but clearly differs in the more numerous lateral veins, the shorter basal lateral veins, and the smaller veins of the lamina which are clearly visible above.

2. Sterile specimens with lanceolate laminas, 12–25 cm long, with 7–14 pairs of lateral veins, the basal lateral veins are usually short, up to 1/20–1/10 the length of the lamina, and the margin often revolute towards the base of the lamina, have been regarded as representing the juvenile form of *F. binnendijkii*. The venation of the lamina shows more similarities to that of *F. benjamina*, than the presumably adult specimens do. This would be the only case (in subg. *Urostigma*) of clear differences between the juvenile and the adult state. Some doubt is shed on the supposition by features of figs assigned to the 'juvenile' form. They are clearly larger (c. 1 cm diam.) than of 'adult' specimens. The 'juvenile' form is worldwide cultivated as indoor and outdoor ornamental.

3. The identity of the examined material referred to var. *latifolia* Corner is too uncertain to include the variety in the synonymy of the species (Corner, Gard. Bull. Singapore 17 (1960) 395).

18. Ficus borneensis Kochummen

Ficus borneensis Kochummen, Gard. Bull. Singapore 50 (1998) 202; Tree Fl. Sabah & Sarawak 3 (2000) 222.

Ficus chewii Kochummen, Gard. Bull. Singapore 50 (1998) 203; Tree Fl. Sabah & Sarawak 3 (2000) 226.

Ficus kerangasensis Kochummen, Gard. Bull. Singapore 50 (1998) 207; Tree Fl. Sabah & Sarawak 3 (2000) 236.

Tree up to 20(–30) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to blackish. *Leafy twigs* 2–3 mm thick, ± angular, glabrous or minutely

white puberulous; periderm persistent or flaking off. *Leaves* spirally arranged to subdistichous; lamina elliptic to oblong or (sub)obovate, (2.5–)5–10(–13) by 1–4(–6) cm, coriaceous, apex (sub)acuminate to obtuse (to rounded), base rounded to cuneate, margin flat or ± revolute (towards the base); upper surface glabrous (or sparsely and minutely white puberulous at the base of the midrib), lower surface glabrous; midrib (at least the lower part) ± impressed above, lateral veins (4–)5–8 pairs, the basal pair distinct, up to (1/5–)1/4–1/3(–1/2) the length of the lamina, unbranched, ± curved to straight, tertiary largely parallel to the lateral veins; waxy gland at the base of the midrib; petiole (0.5–)1–2(–2.5) cm long, 1–2(–2.5) mm thick, glabrous (or minutely white puberulous), drying dark brown to blackish; stipules (0.5–)1–1.5 cm long, glabrous or sparsely to densely minutely white puberulous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 3–5 mm long, (sub)equal, glabrous (or minutely white puberulous), the median part distinct, persistent; receptacle ellipsoid, 0.5–1(–1.2) cm diam. and 0.7–1.3 cm long, glabrous, red(dish) at maturity, apex flat, ostiole 2.5–3 mm diam., slightly prominent to flat, closed, the 3 upper ostiolar bracts fully imbricate; wall ± shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

Distribution — *Malesia*: Borneo (northern).

Habitat — Forest, at altitudes up to c. 1800 m.

Notes — 1. Under this name three species described by Kochummen (1998) are combined. The figs are similar in shape, rather similar in dimensions, and basal bracts; the apex of the receptacle is flat and the ostiole closed. There are differences in the shape of the lamina which could be related to environmental conditions.

Form A (described as *F. borneensis*). — Lamina oblong to elliptic, apex acuminate, base cuneate to obtuse. — Forest, at altitudes up to 1800 m. — It resembles in its vegetative parts and fig size and shape *F. pellucidopunctata*, which differs clearly and only in the widely open ostiole. It resembles in its vegetative parts *F. sumatrana*, which differs in the subglobose fig receptacle.

Form B (described as *F. chewii*). — Lamina elliptic to oblong, often more thickly coriaceous, with shortly acuminate to obtuse or rounded apex, and rounded to obtuse base. — Forest, at altitudes between (650–)1000 and 1500 m. — This form resembles a collection from the Philippines, Mindanao (*University of San Carlos 756*) with ellipsoid figs as in *F. borneensis* but with an open ostiole. In other features it matches *F. callophylla* (in which it is provisionally included).

Form C (described as *F. kerangasensis*). — Lamina (sub)obovate, and often more thickly coriaceous; base cuneate to obtuse. — Kerangas forest, at low altitudes.

2. The shape of the figs of Form B of *F. sundaica* is similar to that of this species, but the figs are larger, 1.5–2 cm diameter. The other form of *F. sundaica* can be distinguished by the larger leaves, mostly 10–20 cm long.

19. Ficus bracteata (Wall. ex Miq.) Miq.

Ficus bracteata (Wall. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285; King, Sp. Ficus 1 (1887) 23, t. 19; Fl. Brit. India 5 (1888) 501; Boerl., Bull. Inst. Bot. Buitenzorg 5 (1900) 28; Koord., Atlas Baumart. Java 4 (1916) t. 705; Merr., Enum. Born. (1921) 221; Ridl., Fl. Malay Penins. 3 (1924) 331; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1005; Corner, Gard. Bull. Singapore 21 (1965) 15; Kochummen, Tree Fl. Malaya 3 (1978) 141. — *Urostigma bracteatum* Wall. ex Miq., London J. Bot. 6 (1847) 576.

Tree up to 15 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 5–10 mm thick, ± angular, densely (dark) brown floccose-tomentose to -subvillous, glabrescent; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic to subobovate, 14–33 by 6–17 cm, coriaceous, apex short-acuminate to rounded, base (sub)cordate; 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) ± impressed above, lateral veins 7–11 pairs, the (main) basal pair distinct, up 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 2–6 cm long, ± densely brown floccose-tomentose to -subvillous, subpersistent. *Figs* axillary, paired (or solitary), sessile, calyptrate bud covers absent (?); basal bracts 3, 7–9 mm long, ± unequal, (1 or) 2 with a distinct median part, puberulous on the median part or glabrous, persistent; receptacle (depressed-)subglobose, 1.2–2 cm diam. when dry, brown floccose-tomentose to -subvillous, glabrescent, yellow to orange to red at maturity, apex (almost) flat to ± concave, (sunken) ostiole 3–4 mm diam., flat to slightly prominent, the 3 upper ostiolar bracts fully imbricate; wall ± shrivelled when dry; internal hairs present, short, crinkled, and brown. *Tepals* reddish. *Ovary* red.

Distribution — Thailand, Cambodia, Vietnam; in *Malesia*: Sumatra, Malay Peninsula, Borneo (?).

Habitat — Forest, at low altitudes.

Notes — 1. The species shows close affinities to *F. consociata* from which it clearly differs in the ± sunken ostiole.

2. The presence in Borneo (see Corner 1965: 15) is not certain as no records could be found.

20. Ficus calcicola Corner

Ficus calcicola Corner, Gard. Bull. Singapore 17 (1960) 392; 21 (1965) 19; Kochummen, Tree Fl. Malaya 3 (1978) 142.

Tree up to 16 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; periderm flaking off. *Leaves* spirally arranged to subdistichous; lamina oblong to elliptic, 4–10(–13) by (1.5–)2–5(–5.5) cm, (sub)coriaceous, apex acuminate, base rounded to obtuse, margin flat to slightly revolute; upper surface glabrous, lower surface sparsely brown puberulous to subtomentose on the midrib or also on the lateral veins; midrib prominent, lateral veins 5–7(–8) pairs, the basal pair ± to hardly distinct, up 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 or 1 pairs of smaller lateral veins below the main pairs; 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, drying blackish; stipules 0.5–1 cm long, brown subtomentose to puberulous, drying brown, caducous. *Figs* axillary or just below the leaves, solitary or

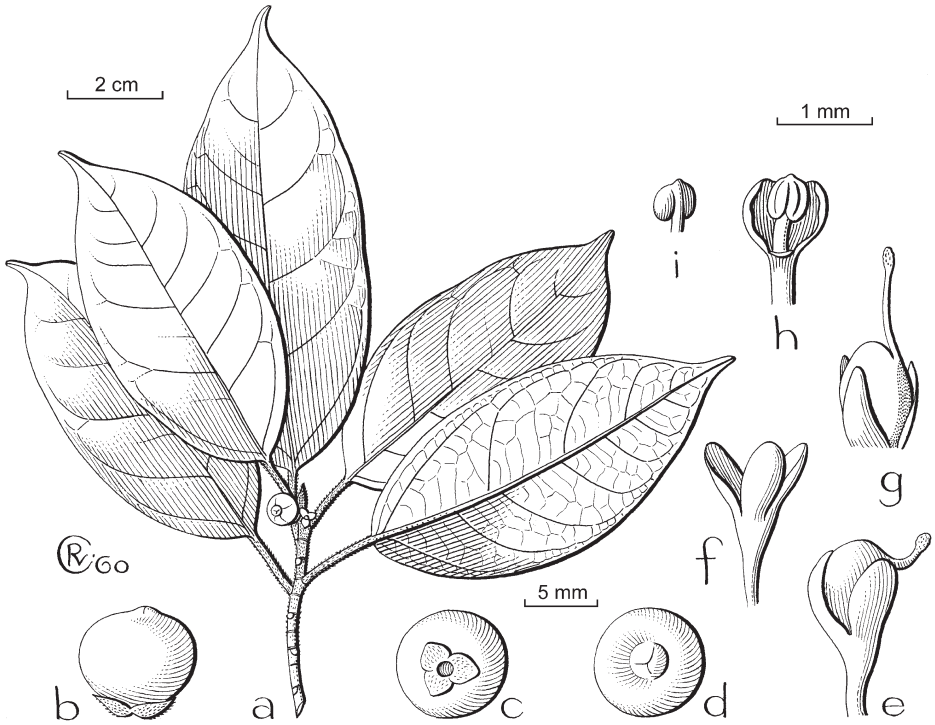


Fig. 112. *Ficus calcicola* Corner. a. Leafy twig with fig; b. fig; c. basal bracts; d. ostiole; e. short-styled flower; f. pedicel and perianth of short-styled flower; g. long-styled flower; h. staminate flower; i. stamen (a–g: *SF 34388*; h, i: *Macan 1738*).

paired, sessile; basal bracts 3, 1–2 mm long, subequal, puberulous, persistent; receptacle subglobose, 0.5–0.8 cm diam. when dry, glabrous or minutely puberulous, 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. — **Fig. 112.**

Distribution — Myanmar, S China (Yunnan), Thailand; in *Malesia*: Malay Peninsula (Perak, Salangor).

Habitat — Deciduous forest, mostly on limestone, sometimes on granite or quartzite cliffs or boulders, at low altitudes.

21. **Ficus callophylla** Blume

Ficus callophylla Blume, Bijdr. (1825) 445; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 265, 287; King, Sp. Ficus 1 (1887) 52, t. 51A; Koord., Versl. Minahassa (1898) 597; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 116; Koord., Atlas Baumart. Java 4 (1916) t. 734; Backer & Bakh.f., Fl. Java 2 (1965) 24; Corner, Gard. Bull. Singapore 21 (1965) 22; Kochummen, Tree Fl. Malaya 3 (1978) 142; Tree Fl. Sabah & Sarawak 3 (2000) 225. — *Urostigma callophyllum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 349.

Ficus tylophylla Hassk., Cat. Hort. Bog. (1844) 75.

Urostigma clusioides Miq., London J. Bot. 6 (1847) 579; Fl. Ind. Bat. 1, 2 (1859) 340. — *Ficus clusioides* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; King, Sp. Ficus 1 (1887) 42, t. 50; Náves & Fern.-Vill., Nov. App. (1880) 199; S. Vidal, Phan. Cuming. (1885) 145; Rev. Pl. Vasc. Filip. (1886) 250; Koord., Versl. Minahassa (1898) 597; Merr., Bull. Bur. For. Philipp. 1 (1903) 18; Elmer, Leafl. Philipp. Bot. 4 (1911) 1380; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 49; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 200.

Ficus pachyphylla Merr., Philipp. J. Sci., Bot. 8 (1913) 365, non King 1887; Enum. Philipp. Flow. Pl. 2 (1923) 60; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 201. — *Ficus callophylla* Blume var. *leytensis* Corner, Gard. Bull. Singapore 17 (1960) 396.

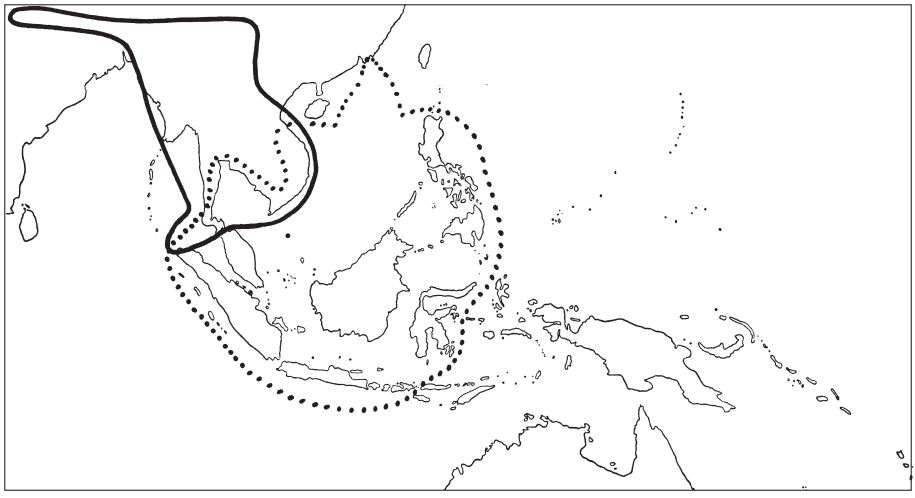
Ficus binnendijkii (Miq.) Miq. var. *cupulata* Corner, Gard. Bull. Singapore 17 (1960) 395.

Ficus callophylla Blume var. *malayana* Corner, Gard. Bull. Singapore 17 (1960) 396; Kochummen, Tree Fl. Malaya 3 (1978) 142.

Ficus callophylla Blume var. *minor* Corner, Gard. Bull. Singapore 17 (1960) 397.

Ficus everettii auct. non Elmer: Elmer, Leafl. Philipp. Bot. 9 (1937) 3459.

Tree up to 25 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to yellowish. *Leafy twigs* (1–)2–6 mm thick, ± angular, glabrous (or white puberulous); periderm persistent. *Leaves* spirally arranged to subdistichous; lamina oblong to elliptic to (sub)obovate, (3–)6–13(–18) by (1–)3–6(–9) cm, coriaceous, apex short-acuminate to rounded, the acumen usually obtuse, base cuneate to obtuse, margin ± revolute and callose (towards the base and extending to the base of the lamina); both surfaces glabrous; midrib ± impressed (at least the lower part) above, lateral veins 6–10 pairs, the basal pair ± distinct, up to 1/4–1/3(–1/2) the length of the lamina, unbranched (or faintly branched), 0 or 1 pairs of smaller lateral veins below the main pair, tertiary venation largely parallel to the lateral veins, slightly prominent to flat and then often obscure like the smaller veins, sometimes also the lateral veins obscure; waxy gland at the base of the midrib; petiole (0.5–)1–4 cm long, (1–)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),



Map 17. Distribution of some species of subg. *Urostigma* subsect. *Conosycea*: *F. callophylla* Blume (dotted line); *F. curtipes* Corner (continuous line).

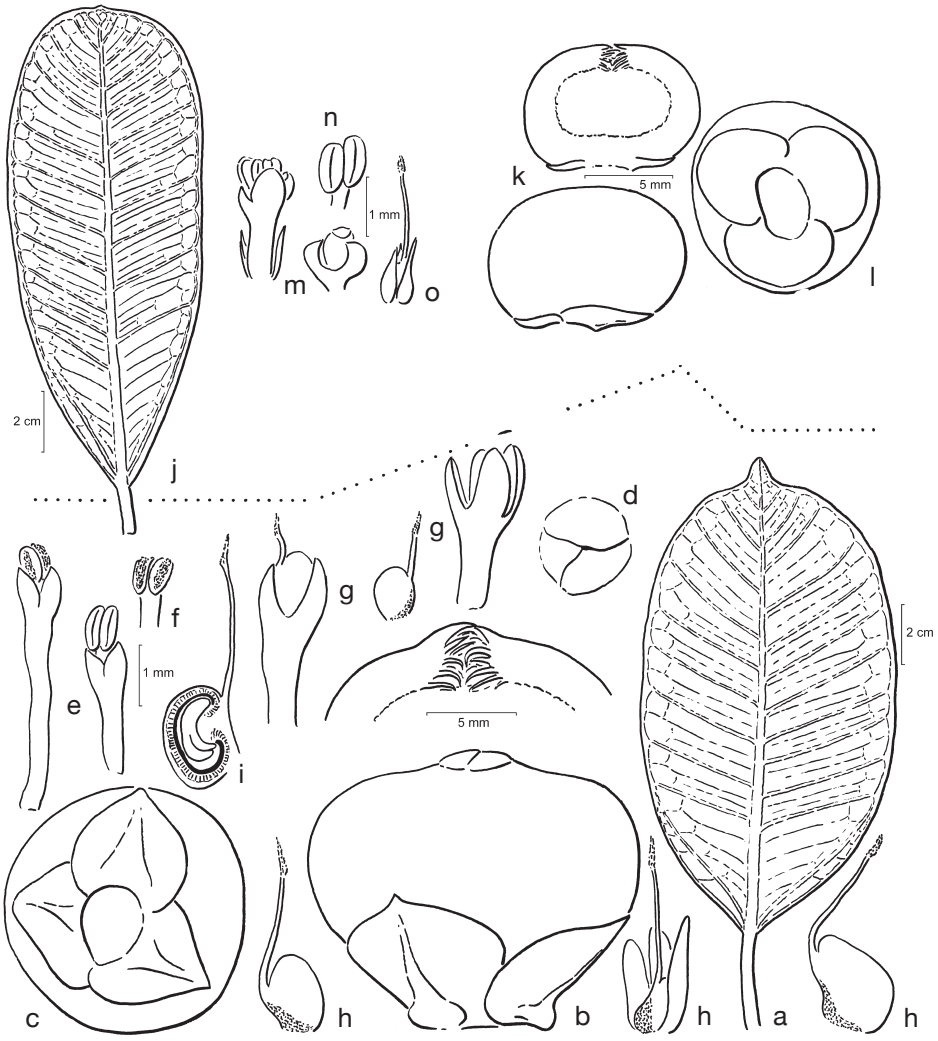


Fig. 113. a–i: *Ficus callophylla* Blume. a. Leaf; b. fig; c. basal bracts; d. ostioles; e. staminate flowers; f. stamen; g. short-styled flowers and separate perianth and pistil; h. pistil of long-styled flower; i. fruit and embryo. — j–o: *Ficus curtipes* Corner. j. Leaf; k. figs; l. basal bracts; m. staminate flowers; n. stamen; o. long-styled flower (all: collections used unknown). From Philos. Trans., Ser. B, 281 (1978) 362.

sessile; basal bracts 3, 4–8(–10) mm long, (sub)equal, broadly ovate to semicircular with a rounded apex, glabrous (or white puberulous), persistent; receptacle (depressed-) subglobose (or ellipsoid), (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 mm diam., slightly prominent, open (to closed), the 3 upper ostiolar bracts, unequal, not, hardly or just imbricate; wall ± shrivelled (or smooth) when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red. — **Fig. 113a–i; Map 17.**

Distribution — Thailand, S China (Hong Kong), Indochina; in *Malesia*: Sumatra, Malay Peninsula, Java, Lesser Sunda Islands (Sumbawa), Borneo, Philippines, Celebes.

Habitat — Forest, at low altitudes.

Notes — 1. In Celebes, the fig receptacle is often small (0.6–0.8) cm diam. and the wall may be smooth (var. *minor*), whereas in the Malay Peninsula and Sumatra it is larger, 1.3–1.8 cm diam. and the basal bracts sometimes up to 10 mm long (var. *malayana*).

2. Two collections (*Meyer 39* and *3880*) from W Sumatra (Mt Sago) at 1000–1100 m have figs which are longer than wide.

3. A collection from the Philippines, Mindanao (*University of San Carlos 756*), has ellipsoid figs (resembling those of *F. borneensis*), except for the open ostiole.

22. Ficus chrysolepis Miq.

Ficus chrysolepis Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 215, 286; King, Sp. Ficus 1 (1887) 24, t. 20; Koord., Versl. Minahassa (1898) 597; Merr., Publ. Gov. Lab. Philipp. 29 (1905) 11; Corner, Gard. Bull. Singapore 21 (1965) 12.

Tree up to c. 35 m tall, hemi-epiphytic (?) or terrestrial. *Branches* drying yellowish to brown. *Leafy twigs* (3–)5–10 mm thick, ± angular, glabrous or brownish to whitish puberulous (mainly on the scars of the stipules). *Leaves* spirally arranged; lamina oblong to elliptic (or to subovate or to oblanceolate), (8–)10–23(–28) by (2–)3–10(–14) cm, coriaceous, apex acuminate, base cuneate to obtuse (to truncate), minutely auriculate or not; upper surface glabrous or brownish puberulous on the midrib, lower surface glabrous or brownish to whitish puberulous on the veins; cystoliths on both sides; midrib flat to slightly impressed above, lateral veins (7–)10–15 pairs, the basal pair slightly to hardly distinct, up to 1/20–1/5 the length of the lamina, unbranched, tertiary venation reticulate (to subscalariform); waxy gland at the base of the midrib; petiole 1.5–5.5(–8) cm long, 2–3 mm thick, glabrous (or brownish puberulous), drying blackish; stipules (0.5–)1–2(–8) cm long, brownish puberulous to subsericeous or glabrous, caducous. *Figs* axillary, in pairs (or solitary), initially enclosed in up to 1 cm long calyptrate bud covers; peduncle 0.5–3.5 cm long, the apex dilated into a rim; basal bracts 3, inserted inside the rim of the peduncle, 2–3 mm long, subequal, sometimes connate, (sparsely) brownish puberulous to subsericeous or glabrous, sooner or later caducous (or persistent?); receptacle subglobose to ellipsoid, 1.3–3.5 cm diam. when dry, sometimes short-stipitate, glabrous or brownish puberulous to pubescent, yellowish (or pinkish) at maturity, apex convex (and submammillate), ostiole 2–3 mm diam., slightly prominent (to sunken), open, the 3 upper ostiolar bracts, unequal, not (or slightly) imbricate, thick, often hairy, the space left open by the upper ostiolar bracts usually filled with lower ostiolar bracts; wall smooth or (except for the apical part) slightly (or ± strongly) shrivelled when dry; internal hairs absent. *Tepals* reddish to pinkish. *Ovary* partly red.

Note — Two subspecies can be recognized:

a. subsp. **chrysolepis**

Ficus chrysolepis Miq. var. *longepedunculata* Merr., Publ. Gov. Lab. Philipp. 29 (1905) 11. — *Ficus longepedunculata* (Merr.) Elmer, Leafl. Philipp. Bot. 1 (1907) 50, 244; Merr., Enum. Philipp. Flow.

Pl. 2 (1923) 55; Elmer, Leafl. Philipp. Bot. 9 (1937) 3450; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 181.

Ficus hallieri Merr. ex Elmer, Leafl. Philipp. Bot. 2 (1908) 536; 4 (1911) 1243; Merr., Philipp. J. Sci. 18 (1921) 54; Enum. Philipp. Flow. Pl. 2 (1923) 53; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 181.

Ficus magallanensis Elmer, Leafl. Philipp. Bot. 4 (1911) 1315.

Leafy twigs 3–8(–10) cm thick. *Base of the lamina* not minutely auriculate; lateral veins (7–)10–14 pairs, the basal pair up to 1/10–1/5 the length of the lamina. *Fig peduncle* 1–3.5 cm long; receptacle subglobose, 2.5–3.5 cm diam. when dry. — **Map 16.**

Distribution — *Malesia*: Philippines, Celebes, Moluccas (Obi, Ambon).

Habitat — Forest, often along rivers, at altitudes up to 1300 m.

b. subsp. **novoguineensis** (Corner) C.C. Berg

Ficus chrysolepis Miq. subsp. *novoguineensis* (Corner) C.C. Berg, Blumea 49 (2004) 467. — *Ficus novoguineensis* Corner, Gard. Bull. Singapore 18 (1960) 84; 21 (1965) 12.

Leafy twigs 2–6 cm thick. *Base of the lamina* minutely auriculate; lateral veins 10–15 pairs, the basal pair up to 1/20–1/10 the length of the lamina. *Fig peduncle* 0.5–2.5 cm long; receptacle subglobose, 1.3–2 cm diam. when dry. — **Map 16.**

Distribution — *Malesia*: New Guinea (eastern, incl. New Britain).

Habitat — Forest, at altitudes up to 1700 m.

23. Ficus consociata Blume

Ficus consociata Blume, Bijdr. (1825) 447; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; King, Sp. Ficus 1 (1887) 33, t. 36; Fl. Brit. India 5 (1888) 505; Boerl., Bull. Inst. Bot. Buitenzorg 5 (1900) 27; Becc., For. Borneo (1902) 262; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 91; Koord., Atlas Baumart. Java 4 (1916) t. 719; Merr., Enum. Born. (1921) 222; Ridl., Fl. Malay Penins. 3 (1924) 331; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 569; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1006; Corner, Wayside Trees (1940) 676; Backer & Bakh.f., Fl. Java 2 (1965) 34; Corner, Gard. Bull. Singapore 21 (1965) 15; Kochummen, Tree Fl. Malaya 3 (1978) 144; Tree Fl. Sabah & Sarawak 3 (2000) 248. — *Urostigma consociatum* (Blume) Miq. in Zoll., Syst. Verz. 2 (1854) 91; Fl. Ind. Bat. 1, 2 (1859) 337; Fl. Ind. Bat., Suppl. (1861) 437.

Ficus consociata Blume var. *murtonii* King, Sp. Ficus 1 (1887) 34, t. 37; Corner, Gard. Bull. Singapore 21 (1965) 15; Kochummen, Tree Fl. Malaya 3 (1978) 144.

Tree up to 35 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 4–7 mm thick, ± angular, densely (dark) brown (to whitish) floccose-tomentose, glabrescent; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic to subobovate (to oblanceolate), (5–)10–20(–27) by (2.5–)4–9(–14) cm, coriaceous, apex short-acuminate to rounded, base rounded to obtuse or to subcordate; upper surface brown tomentose, mainly on the lower part and on the main 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 pairs, the basal pair distinct, up to 1/4–1/3(–1/2) the length of the lamina, branched, usually 1 pair of smaller lateral veins below the main pair, tertiary venation reticulate (to subscalariform), prominent beneath; waxy gland at the base of the midrib; petiole 1–3(–6) cm long, 2–3 mm thick, densely brown floccose-tomentose,

glabrescent, drying brown to blackish; stipules 1–2(–6) cm long, ± densely brown to greyish floccose-tomentose (to -subvillous), caducous (or subpersistent). *Figs* axillary, paired (or solitary), sessile, calyptrate bud covers absent (?); basal bracts 3, 4–8 mm long, ± unequal, (1 or) 2 with a distinct median part (or keeled), puberulous on the median part or glabrous, persistent; receptacle (depressed-)subglobose, 0.8–1.2(–1.5) cm diam. when dry, brown tomentose, glabrescent, orange to dark red at maturity, apex ± convex to submammillate, ostiole 3–5 mm diam., flat to prominent, closed, the 3 upper ostiolar bracts fully imbricate; wall ± shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* red.

Distribution — Myanmar, Cambodia, Thailand; in *Malesia*: Sumatra (incl. Banka, Billiton, Riouw), Malay Peninsula, Java, Borneo.

Habitat — Forest, at altitudes up to c. 1000 m.

Notes — 1. Some collections, in particular from the Malay Peninsula and Sumatra, have relatively long laminas (longer than 15 cm) and petioles (longer than 2.5 cm) and relatively large fig receptacles (more than 1.2 cm diam. – var. *muronti*).

2. According to Corner (1965: 15) the species also occurs in Cambodia, Thailand, and Vietnam, but that could not be confirmed.

24. Ficus cordatula Merr.

Ficus cordatula Merr., Philipp. J. Sci., Bot. 3 (1908) 131; Enum. Philipp. Flow. Pl. 2 (1923) 50; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 210; Corner, Gard. Bull. Singapore 21 (1965) 14.

Ficus strangularis Elmer, Leafl. Philipp. Bot. 4 (1911) 1382; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 66; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 206.

Ficus sericea C.B. Rob., Philipp. J. Sci., Bot. 6 (1911) 319; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 65; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 210. — *Ficus cordatula* Merr. var. *sericea* (C.B. Rob.) Corner, Gard. Bull. Singapore 17 (1960) 381.

Ficus camarinensis Merr., Philipp. J. Sci., Bot. 9 (1914) 269; Enum. Philipp. Flow. Pl. 2 (1923) 47; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 212.

Ficus silvestrei Elmer, Leafl. Philipp. Bot. 9 (1937) 3462; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 212.

Tree up to 20 (or more?) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 3–8(–10) mm thick, ± angular, white puberulous and/or sparsely yellow subsericeous (on and near the scars of the stipules) to subglabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong (to elliptic), 12–25(–32) by 7–13(–16) cm, coriaceous, apex acuminate, base cordate to rounded (to obtuse), margin sometimes sinuate; upper surface glabrous, lower surface glabrous or minutely white puberulous on the midrib; cystoliths on both sides; midrib flat above, lateral veins 9–15 pairs, the basal pair distinct, up to 1/6–1/5(–1/4) the length of the lamina, (sparsely and/or faintly) branched, 1–3 pairs of smaller lateral veins below the main pair, tertiary venation reticulate; waxy gland at the base of the midrib; petiole 1–5.5 cm long, 2–3 mm thick, glabrous or minutely white puberulous, drying blackish to brown; stipules 1–1.5 cm long, (sparsely) yellowish sericeous, caducous, often with a distinct median part. *Figs* axillary, in pairs (or solitary), sessile; basal bracts 2 or 3, 1–4 mm long, unequal in size, yellowish subsericeous, persistent; receptacle ellipsoid to ovoid or to subcylindrical, 2–2.5(–3) cm diam. and up to 5 cm long when dry, some-

times substipitate, (sub)glabrous, at maturity yellow (or red?), apex flat to concave, ostiole 2–3 mm diam., ± prominent, open, the 3 upper ostiolar bracts subequal, not fully imbricate; wall ± shrivelled when dry; internal hairs present, also on the pedicels. *Tepals* pinkish (to whitish?). *Ovary* partly red(dish) to whitish.

Distribution — *Malesia*: Philippines, Celebes (north-eastern).

Habitat — Forest, at low altitudes.

Note — This species is distinct by the abundant hairs inside the fig receptacle, not only on the wall, but also on the pedicels.

25. Ficus corneri Kochummen

Ficus corneri Kochummen, Gard. Bull. Singapore 50 (1998) 204.
Ficus lowii King var. *borneensis* Corner, Gard. Bull. Singapore 17 (1960) 389; 21 (1965) 18; Tree Fl. Sabah & Sarawak 3 (2000) 237.

Tree, hemi-epiphytic or a climber (?). *Branches* drying brown. *Leafy twigs* 2–4 mm thick, ± angular, glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to lanceolate, 10–21 by 3.5–8.5 cm, coriaceous, apex acuminate, base cuneate to obtuse, margin slightly revolute to flat; both surfaces glabrous; midrib flat or slightly impressed towards the base above, lateral veins 8–12 pairs, the basal pair distinct, up to 1/8–1/3 the length of the lamina, unbranched, running parallel to the margin, tertiary venation reticulate to partly parallel to the lateral veins, areoles obscure; waxy gland at the base of the midrib; petiole 2–5 cm long, 1.5–3 mm thick, glabrous, drying brown; stipules 1–2.5 cm long, glabrous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 1–1.5 mm long, ± unequal, glabrous, persistent; receptacle subglobose, 1.2–1.5 cm diam. when dry, glabrous, yellowish (?) at maturity, apex slightly convex, ostiole c. 2.5 mm diam., (almost) flat, closed, the 3 upper ostiolar bracts fully imbricate; wall smooth when dry; internal hairs absent. *Tepals* red. *Ovary* partly red.

Distribution — *Malesia*: Borneo (Sabah and Balikpapan region).

Habitat — Forest, at low altitudes.

Note — This species shows some similarities to *F. lowii*, as in the colour of the dried lamina and the main venation pattern.

26. Ficus crassiramea (Miq.) Miq.

Ficus crassiramea (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Corner, Gard. Bull. Singapore 17 (1960) 384; 21 (1965) 16; Kochummen, Tree Fl. Malaya 3 (1978) 144; Tree Fl. Sabah & Sarawak 3 (2000) 323. — *Urostigma crassirameum* Miq., Pl. Jungh. (1851) 48.

Tree up to 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to blackish. *Leafy twigs* (3–)5–18 mm thick, ± angular, glabrous, sparsely minutely white puberulous mainly on the scars of the stipules or densely white puberulous; periderm persistent. *Leaves* spirally arranged; lamina oblong to subobovate to elliptic (or to oblanceolate), (8–)10–30(–38) by (3–)4–14(–16) cm, coriaceous, apex short-acuminate (to obtuse), the acumen mostly obtuse, base cuneate to rounded or to truncate (to cordate); upper surface glabrous (or minutely whitish puberulous on the midrib), lower surface glabrous or minutely white puberulous on the midrib or densely

puberulous to subvelutinous on all veins; cystoliths on both sides; midrib ± prominent above to flat (or towards the base slightly impressed) above, lateral veins 6–12 pairs, the basal pair distinct, up to 1/8–1/3(–1/2) the length of the lamina, often (faintly) branched, departing from the midrib 0.2–1 cm above the base of the lamina, 1–3 pairs of smaller lateral veins below the main pair, tertiary venation reticulate or subscalariform, the areoles often small; waxy gland at the base of the midrib; petiole 2–8 cm long, 2–5 mm thick, glabrous or densely white puberulous, drying blackish or brown; stipules (1–)2–5(–14) cm long, sparsely to densely whitish (to brownish) puberulous to subvelutinous with the hairs sometimes retrorse, or glabrous, caducous; terminal buds often ± swollen. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 5–20(–30) mm long, mostly (almost) equal, semicircular to suborbicular with a rounded apex and broadest in or above the middle, covering (1/6–)1/3–2/3 of the receptacle, sometimes 1 or 2 with a distinct median part, glabrous or puberulous on the median part, persistent; receptacle (± depressed-)subglobose or ovoid to obovoid or to ellipsoid, 0.8–1.2, 1.5–2.5, or 2.5–3.5 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 or 6–10 mm diam., slightly prominent, closed, the 3 upper ostiolar bracts fully imbricate, often only 2 visible or the third just; wall ± smooth to ± shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* red.

Note — The species is variable in dimensions of various parts and the presence of indumentum. Two subspecies can be distinguished:

a. subsp. **crassiramea**

Urostigma crassirameum Miq., Pl. Jungh. (1851) 48; Fl. Ind. Bat. 1, 2 (1859) 339. — *Ficus procera* Reinw. ex Blume var. *crassiramea* (Miq.) King, Sp. Ficus 1 (1887) 36, t. 41; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 93; Koord., Atlas Baumart. Java 4 (1916) t. 721.

Ficus procera Reinw. ex Blume, Bijdr. (1825) 445, non Salisb. 1796; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 262, 286; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 92; Koord., Atlas Baumart. Java 4 (1916) t. 720. — *Urostigma procerum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 336; Fl. Ind. Bat., Suppl. (1861) 436. — *Ficus subtecta* Corner, Gard. Bull. Singapore 17 (1960) 386; 21 (1965) 16; Kochummen, Tree Fl. Malaya 3 (1978) 158; Tree Fl. Sabah & Sarawak 3 (2000) 231.

Urostigma rigidum Miq., London J. Bot. 6 (1847) 578; Fl. Ind. Bat. 1, 2 (1859) 338. — *Ficus rigida* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286, non Jack 1822; King, Sp. Ficus 1 (1887) 35, t. 39; Fl. Brit. India 5 (1888) 505; Koord., Atlas Baumart. Java 4 (1916) t. 723; Ridl., Fl. Malay Penins. 3 (1924) 332. — *Ficus subgelderi* Corner var. *rigida* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 387; 21 (1965) 17; Kochummen, Tree Fl. Malaya 3 (1978) 157; C.C. Berg, Blumea 49 (2004) 470.

Ficus patellifera Warb. in K. Schum. & Lauterb., Nachtr. Fl. Schutzgeb. Südsee (1905) 241; Diels, Bot. Jahrb. Syst. 67 (1935) 185; Summerh., J. Arnold Arbor. 22 (1941) 88. — *Ficus crassiramea* (Miq.) Miq. var. *patellifera* (Warb.) Corner, Gard. Bull. Singapore 17 (1960) 385.

Ficus clementis Merr., Philipp. J. Sci., Bot. 3 (1908) 130; Elmer, Leafl. Philipp. Bot. 4 (1911) 1244; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 204 f. 3, 215 f. 14, 219 f. 18; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 49; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 204. — *Ficus crassiramea* (Miq.) Miq. var. *clementis* (Merr.) Corner, Gard. Bull. Singapore 17 (1960) 385.

Ficus crassicalyx Elmer, Leafl. Philipp. Bot. 9 (1937) 3457; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 203.

Ficus stupenda Miq. var. *minor* Corner, Gard. Bull. Singapore 17 (1960) 384.

Ficus crassiramea (Miq.) Miq. var. *brevicupulata* Corner, Gard. Bull. Singapore 17 (1960) 385.

Ficus crassiramea (Miq.) Miq. var. *celebica* Corner, Gard. Bull. Singapore 17 (1960) 385.
Ficus subtecta Corner var. *depressa* Corner, Gard. Bull. Singapore 17 (1960) 386.
Ficus ashtonii Kochummen, Gard. Bull. Singapore 50 (1998) 201; Tree Fl. Sabah & Sarawak 3 (2000) 201.
Ficus procera auct. non Blume: King, Sp. Ficus 1 (1887) 35, t. 40; Ridl., Fl. Malay Penins. 3 (1924) 332; Corner, Wayside Trees (1940) 678, f. 251; Backer & Bakh.f., Fl. Java 2 (1965) 34.

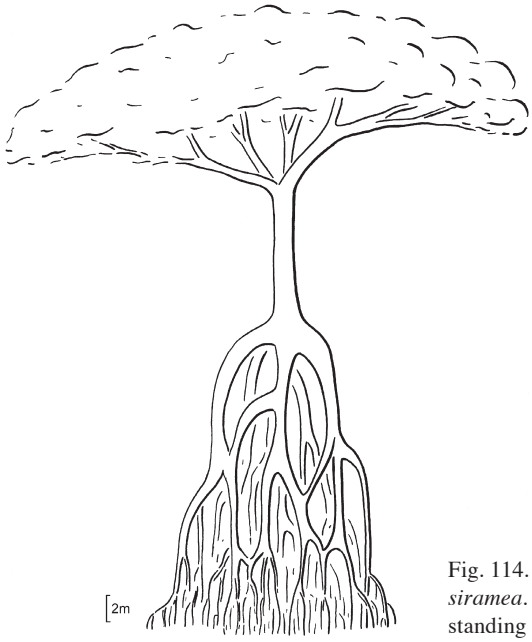


Fig. 114. *Ficus crassiramea* (Miq.) Miq. subsp. *crassiramea*. Habit, schematic of large secondarily free-standing tree, Malaysia, Mt Kinabalu, 1200 m.

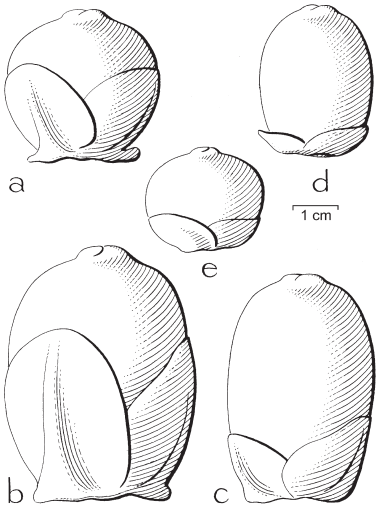


Fig. 115. *Ficus crassiramea* (Miq.) Miq subsp. *crassiramea*. a–e. Variation in shape and size of fig receptacle and basal bracts (a: *SF 21188*; b: *Koorders 19334*; c: *Coll. Agr. Lag. 547*; d: *Hulstijn 111*; e: *NGF 1723*).

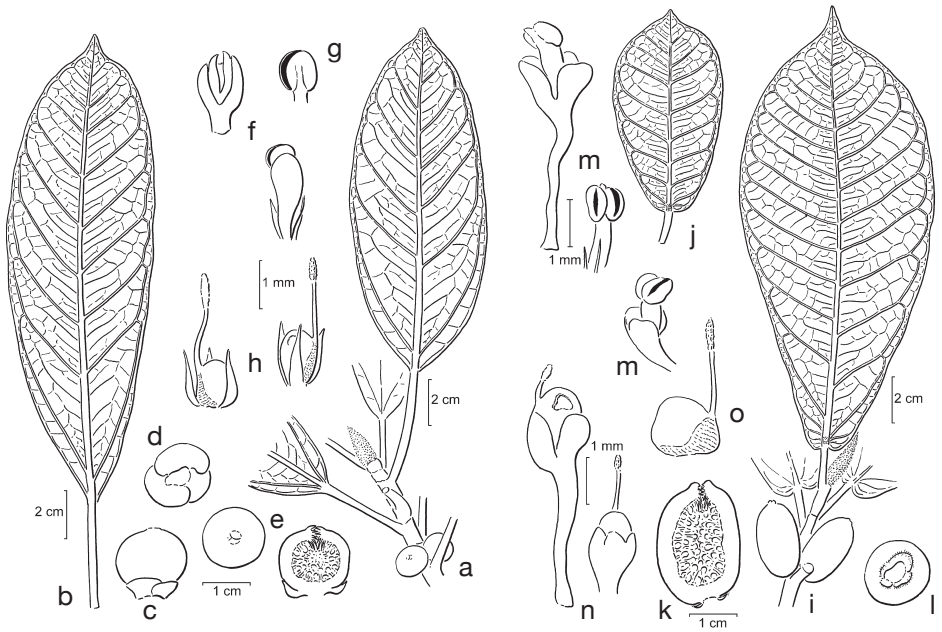


Fig. 116. a–h: *Ficus crassiramea* (Miq.) Miq. subsp. *crassiramea*. a. Leaf twig with figs; b. leaf; c. figs; d. basal bracts; e ostiole; f. staminate flowers; g. stamen; h. long-styled flowers. — i–o: *Ficus drupacea* Thunb. i. Leafy twig with figs; j. leaf; k. fig; l. basal bracts; m. staminate flowers; n. short-styled flowers; o. long-styled flower (a–h: collections used unknown; i–o; *NGF 13408*). From Philos. Trans., Ser. B, 253 (1967) 65.

Leafy twigs (3–)5–10 mm thick, glabrous or sparsely puberulous. *Lamina* (8–)10–20(–30) cm, base cuneate to rounded (to subcordate); lower surface usually glabrous; lateral veins 6–8(–9) pairs, the basal pair sometimes branched, tertiary venation reticulate; petiole 2–4(–7) cm long, 2–3 mm thick, glabrous; stipules (1–)2–4(–7) cm long, glabrous or appressed-puberulous. *Figs*: basal bracts 5–15(–18) mm long; receptacle depressed-globose to ovoid to obovoid or to ellipsoid, 0.8–1.2 or 1.5–2.5 cm diam. when dry; ostiole 2–4 mm diameter. — **Fig. 114, 115, 116a–h.**

Distribution — From Myanmar (lower) and Thailand (lower) to the Solomon Islands; in *Malesia*: Sumatra (incl. Banka), Malay Peninsula, Java, Borneo, Philippines, Celebes (incl. Talaud Islands), Moluccas (Obi), New Guinea (incl. New Britain).

Habitat — Forest, often along coast and rivers, at altitudes up to 1500 m.

Notes — 1. This subspecies is quite variable in the dimensions and shape of the fig receptacle. In the western part of the species range (and infrequently in eastern New Guinea), the receptacle is subglobose, often somewhat depressed, and usually large, 1.5–2 cm diam. when dry. In the eastern part of the range, the receptacle is often smaller, 0.8–1.2 cm diam., and often also ellipsoid to ovoid. The basal bracts of small figs are relatively small (mostly 5–8 cm long), and in ellipsoid ones, covering a smaller part of the receptacle. Ellipsoid to ovoid or to obovoid receptacles are known from the Philippines (Mindanao), Celebes, Moluccas, New Guinea, and the Solomon Islands.

They are usually 1–1.2 cm diam., but larger (c. 1.5 cm diam.) in the Sulu Archipelago (Philippines) and Celebes. Small (depressed-)globose receptacles (0.8–1.2 cm diam.) are known from Java (eastern), Borneo (eastern), the Philippines (Palawan), Talaud Island, and (infrequently) from the Solomon Islands, where the form with ellipsoid figs is predominant.

2. In most of the material the (small) areoles are visible, but in several specimens (from Java) they are obscure. This material has been described as *F. procera*, which name was substituted by *F. subtecta*.

b. subsp. **stupenda** (Miq.) C.C. Berg

Ficus crassiramea (Miq.) Miq. subsp. *stupenda* (Miq.) C.C. Berg, Blumea 49 (2004) 468. — *Ficus stupenda* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; King, Sp. Ficus 1 (1887) 184; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 62; Valeton, Ic. Bog. 3 (1907) t. 237; Koord., Atlas Baumart. Java 4 (1916) t. 704; Backer & Bakh.f., Fl. Java 2 (1965) 31; Corner, Gard. Bull. Singapore 21 (1965) 15; Kochummen, Tree Fl. Malaya 3 (1978) 157; Tree Fl. Sabah & Sarawak 3 (2000) 229. — *Urostigma giganteum* Miq. in Zoll., Syst. Verz. 2 (1854) 90, 96; Fl. Ind. Bat. 1, 2 (1859) 351.

Leafy twigs 10–18 mm thick, densely to sparsely minutely white puberulous. *Lamina* 20–38 by 10–16 cm, base obtuse to subcordate (to cordate); lower surface glabrous or densely minutely white puberulous to subvelutinous on all veins; lateral veins (8–)9–12 pairs, the basal pair mostly branched, tertiary venation subscalariform; petiole (3–)5–8 cm long, 3–5 mm thick, densely minutely white puberulous (or glabrous); stipules 3–5(–14) cm long, ± densely whitish appressed-puberulous. *Figs*: basal bracts 10–20(–30) mm long; receptacle ovoid to ellipsoid, 2.5–3.5 cm diam. when dry, ostiole 6–10 mm diameter.

Distribution — *Malesia*: Western Java, Borneo.

Habitat — Forest, at low altitudes.

Note — All collections from Java have dense indumentum on the lamina beneath and on the petiole, whereas the two examined collections from Borneo have glabrous leaves.

27. Ficus cucurbitina King

Ficus cucurbitina King, Sp. Ficus 1 (1887) 22, t. 17; Merr., Enum. Born. (1921) 222; Corner, Gard. Bull. Singapore 21 (1965) 14; Kochummen, Tree Fl. Malaya 3 (1978) 144; Tree Fl. Sabah & Sarawak 3 (2000) 229.

Ficus elliptifolia Merr., Philipp. J. Sci. 18 (1921) 55; Enum. Philipp. Flow. Pl. 2 (1923) 51; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 209.

Ficus cucurbitina King var. *eubracteata* Corner, Gard. Bull. Singapore 17 (1960) 381.

Tree up 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 to oblong to subobovate, 7–15 by 2.5–8 cm, coriaceous, apex short-acuminate, base subcordate to rounded (to cuneate), margin ciliolate; 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, up to 1/10–1/6 the length of the lamina, (sparsely and/or faintly) branched or unbranched, 1 or 2 (or 3) pairs of smaller lateral veins below the main pair, tertiary venation reticulate to subscalariform, ± prominent beneath; waxy gland up 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 up to 1.2 cm long calyptrate bud covers, sessile; basal bracts 3, 2–8(–12) mm long, subequal to unequal, semicircular (to ovate), with a rounded apex, imbricate or connate at the base, glabrous, persistent; receptacle ellipsoid to cylindrical or to subovoid, 1–2 cm diam. and up 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 c. 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).

Distribution — Thailand; in *Malesia*: Malay Peninsula, Borneo, Philippines (Mindanao, Samar).

Habitat — Forest, at altitudes up to c. 800 m.

Note — The basal bracts are relatively large in the Philippines, sometimes up to 1.2 cm long.

28. **Ficus curtipes** Corner

Ficus curtipes Corner, Gard. Bull. Singapore 17 (1960) 397; 21 (1965) 22; Kochummen, Tree Fl. Malaya 3 (1978) 144. — *Ficus obtusifolia* Roxb., Fl. Ind., ed. Carey 3 (1832) 546, non H.B.K. 1817; Wight, Ic. 2 (1843) t. 662; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 263, 286; Kurz, Forest Fl. Burma 2 (1877) 443; King, Sp. Ficus 1 (1887) 42, t. 49; Fl. Brit. India 5 (1888) 507; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 465; Renner, Bot. Jahrb. Syst. 39 (1907) 381; Ridl., Fl. Malay Penins. 3 (1924) 335; Gagnep., Fl. Indo-Chine 5 (1928) 779; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1012. — *Urostigma obtusifolium* (Roxb.) Miq., London J. Bot. 6 (1847) 569.

Tree up 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 to oblong to elliptic, 6–15(–18) by 3–6(–8.5) cm, coriaceous, apex rounded (to obtuse), base cuneate, 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 flat above, lateral veins 10–13 pairs, the basal pair ± (to hardly) distinct, up to (1/10–)1/4–1/3 the length of the lamina, unbranched, tertiary largely parallel to the lateral veins; waxy gland at the base of the midrib; petiole (0.5–)1–2(–3) 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, 2–5 mm long, (sub)equal, semicircular to broadly ovate with a rounded apex, glabrous or sparsely and minutely puberulous, persistent; receptacle (depressed-) subglobose, 0.8–1.2 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. — **Fig. 113j–o; Map 17.**

Distribution — NE India, Myanmar, S China, Indochina, Thailand; in *Malesia*: Sumatra (Atjeh, P. Bras Island), Malay Peninsula (Langkawi Island).

Habitat — Forest (on limestone hills), at low altitudes.

Note — The presence in Sumatra could not be verified.

29. Ficus delosyce Corner

Ficus delosyce Corner, Gard. Bull. Singapore 17 (1960) 391; 21 (1965) 19; Kochummen, Tree Fl. Malaya 3 (1978) 144; Tree Fl. Sabah & Sarawak 3 (2000) 227.
Ficus delosyce Corner var. *obtusa* Corner, Gard. Bull. Singapore 17 (1960) 391.

Tree up to c. 25 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to blackish. *Leafy twigs* 1–2 mm thick, ± angular, glabrous (or minutely white puberulous); periderm persistent. *Leaves* spirally arranged to subdistichous; lamina oblong to elliptic, 3–9 by 1–5 cm, coriaceous, apex acuminate (to obtuse), base cuneate to obtuse, margin flat or ± revolute (towards the base); upper surface glabrous, lower surfaces glabrous (or sparsely minutely white puberulous on the midrib); midrib (at least the lower part) ± impressed to flat above, lateral veins (4–)5–8 pairs, the basal pair distinct, up to 1/4–1/3(–1/2) the length of the lamina, unbranched, straight or slightly curved, without smaller lateral veins below the (main) pair, tertiary largely parallel to the lateral veins, slightly prominent to flat and then ± obscure, basal and other lateral veins as well as the tertiary venation running in the same direction, departing from the midrib in about equal narrow angles (of about 45°) or basal and other lateral veins as well as the tertiary venation not running in the same direction, the basal lateral veins departing from the midrib in clearly narrower angles than the other venation; waxy gland at the base of the midrib; petiole 0.5–1(–1.5) cm long, 1–1.5 mm thick, glabrous or minutely white puberulous, drying brown; stipules 0.5–1(–1.2) cm long, glabrous (or densely and minutely white puberulous), caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 2–3.5 mm long, (sub)equal, glabrous (or minutely white puberulous), persistent; receptacle subglobose to ovoid (to almost ellipsoid), 0.4–0.7 cm diam. when dry, glabrous, orange to purplish red at maturity, apex convex, ostiole c. 2 mm diam., prominent, ± conical, (almost) closed, the 3 upper ostiolar bracts fully (or hardly) imbricate; wall (almost) smooth to slightly shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* reddish. — **Fig. 117.**

Distribution — *Malesia*: Sumatra (Banka), Malay Peninsula, Borneo.

Habitat — Forest, mostly swamp forest, at low altitudes.

Notes — 1. The ± pronouncedly conical ostiole is characteristic for this species. But in general it resembles *F. sumatrana*, in particular Form C. One may wonder whether the difference in the apex of the fig receptacle justifies separation on the species level or should be regarded as variation similar to that in *F. acamptophylla*.

2. Two forms can be distinguished: one with an acuminate apex of the lamina and the other with a rounded to obtuse apex (confined to northern Borneo). The material from Banka (*Kostermans et al. 354*) is somewhat distinct by the dense minute indumentum

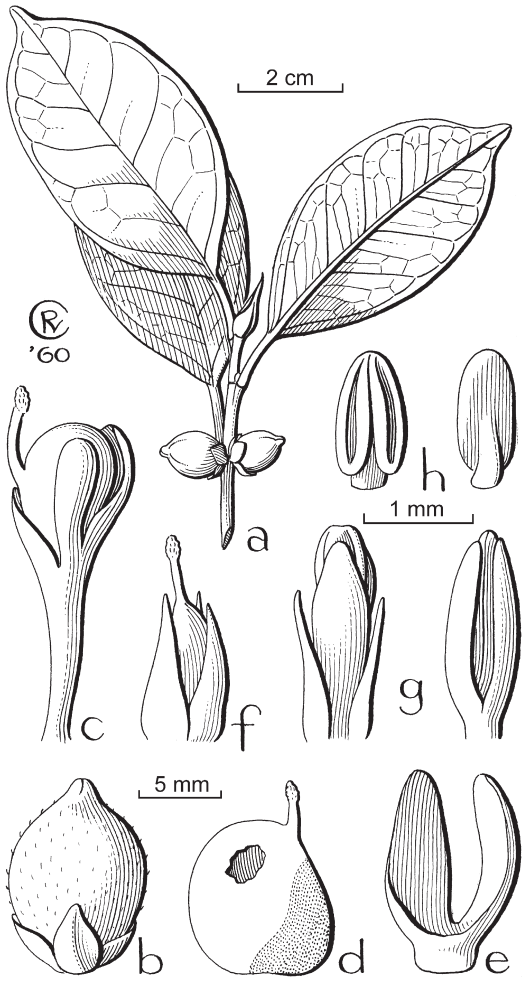


Fig 117. *Ficus delosyce* Corner. a. Leafy twig with figs; b. fig; c. short-styled flower; d. opened 'gall-fruit'; e. part of perianth of short-styled flower; f. long-styled flower; g. staminate flowers, left with interfloral bracts; h. stamens (a: *Brunei 5374*; b–h: *SF 30774*).

on various parts, the stiffly coriaceous lamina with revolute margins, and upper ostiolar bracts which are hardly imbricate.

3. The species is morphologically close to *F. acamptophylla*, from which it mainly differs in the smaller fig receptacle, the more slender petiole, the usually shorter stipules, and the different variation of the shape of the lamina.

30. Ficus depressa Blume

Ficus depressa Blume, Cat. (1823) 35; Bijdr. (1825) 450; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Corner, Gard. Bull. Singapore 17 (1960) 380; 21 (1965) 12; Backer & Bakh.f., Fl. Java 2 (1965) 31; Kochummen, Tree Fl. Malaya 3 (1978) 145; Tree Fl. Sabah & Sarawak 3 (2000) 246. — *Urostigma depressum* (Blume) Miq., London J. Bot. 6 (1847) 576; Fl. Ind. Bat. 1, 2 (1859) 351.

Ficus pruniformis Blume, Bijdr. (1825) 451; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 266, 286; King, Sp. Ficus 1 (1887) 24, t. 21; Fl. Brit. India 5 (1888) 502; Koord. & Valeton, Bijdr. Boomsoort. Java

11 (1906) 73; Koord., Atlas Baumart. Java 4 (1916) t. 709; Merr., Enum. Born. (1921) 226; Enum. Philipp. Flow. Pl. 2 (1923) 62; Ridl., Fl. Malay Penins. 3 (1924) 333; Gagnep., Fl. Indo-Chine 5 (1928) 782; Elmer, Leafl. Philipp. Bot. 9 (1937) 3453; Corner, Wayside Trees (1940) 678; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 182, 251. — *Urostigma pruniforme* (Blume) Miq. in Zoll., Syst. Verz. 2 (1854) 91, 97; Fl. Ind. Bat. 1, 2 (1859) 352; Fl. Ind. Bat., Suppl. (1861) 440.
Ficus johnsonii Elmer, Leafl. Philipp. Bot. 1 (1907) 190.

Tree up to c. 30 m tall, hemi-epiphytic or (secondarily?) terrestrial , sometimes a climber. *Branches* drying yellowish to brown. *Leafy twigs* 2–5 mm thick, ± angular, glabrous or sparsely brownish to whitish puberulous (mainly on the scars of the stipules). *Leaves* spirally arranged; lamina oblong to elliptic (or to lanceolate), 5–16(–23) by 1.2–6.5(–8.5) cm, coriaceous, apex acuminate, base cuneate to rounded; upper surface glabrous, lower surface ± 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 flat or slightly impressed towards the base, lateral veins 7–12 pairs, the basal pair slightly to hardly distinct, up to 1/20–1/10(–1/6) the length of the lamina, unbranched, 0 or 1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate, slightly prominent to almost flat 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 up to 3 cm long when dry, sometimes, shortly stipitate, glabrous, yellowish at maturity, apex convex, (sub)mammillate and 2- or 3-lobed (by prominent upper ostiolar bracts), ostiole 2–3 mm diam., prominent, open, the 3 upper ostiolar bracts unequal, slightly or not imbricate, thick; wall ± shrivelled when dry; internal hairs absent. *Tepals* red to pinkish. *Ovary* partly reddish. — **Map 16.**

Distribution — Thailand; in *Malesia*: Sumatra (western), Malay Peninsula, Java (eastern), Lesser Sunda Islands (Bali, Sumbawa, Sumba, Flores, Timor), Borneo, Philippines (Luzon, Pollilo Island).

Habitat — Forest, at altitudes up to c. 1100 m.

Notes — 1. The status of *F. iwahigensis* Elmer, Leafl. Philipp. Bot. 4 (1912) 1381 (p.p. foliorum, alt.p. *F. forstenii* Miq.); Merr., Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 252 could not be verified. In Corner's checklist the species name figures under 'excluded species'.

2. There are no collections in L to verify the presence of the species in Bali, Sumba and Timor.

31. Ficus drupacea Thunb.

Ficus drupacea Thunb., Diss. Fic. (1786) 6, 11; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Corner, Gard. Bull. Singapore 17 (1960) 380; 21 (1965) 13; Backer & Bakh.f., Fl. Java 2 (1965) 31; Corner, Rev. Handbook Fl. Ceyl. 1, 2 (1977) 134, t. 11; Kochummen, Tree Fl. Malaya 3 (1978) 145, Tree Fl. Sabah & Sarawak 3 (2000) 228. — *Urostigma drupaceum* (Thunb.) Miq., London J. Bot. 6 (1847) 581.
Ficus citrifolia Willd., Sp. Pl. 4 (1806) 1137, non Mill. 1768.

Ficus mysorensis B. Heyne ex Roth in Roem. & Schult., Syst. Veg. 1 (1817) 508; Roth, Nov. Pl. Sp. (1821) 390; King, Sp. Ficus 2 (1888) 20, t. 14. — *Urostigma mysorense* (B. Heyne ex Roth) Miq., London. J. Bot. 6 (1847) 574.

Ficus mysorensis B. Heyne ex Roth var. *pubescens* Roth in Roem. & Schult., Syst. Veg. 1 (1817) 508. — *Ficus drupacea* Thunb. var. *pubescens* (Roth) Corner, Gard. Bull. Singapore 17 (1960); 21 (1965) 13.

Ficus chrysocoma Blume, Bijdr. (1825) 443; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285; King, Fl. Brit. India 5 (1888) 501; Merr., Enum. Born. (1921) 222. — *Ficus pilosa* Reinw. ex Blume var. *chrysocoma* (Blume) King, Sp. Ficus 1 (1887) 21.

Ficus pilosa Reinw. ex Blume, Bijdr. (1825) 446; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 260, 285; Benth., Fl. Austral. 6 (1873) 164; Kurz, Forest Fl. Burma 2 (1877) 441; Náves in Blanco, Fl. Filip., ed. 3 (1880) 200, f. 203; King, Sp. Ficus 1 (1887) 21, t. 16; Fl. Brit. India 5 (1888) 500; Boerl., Handl. 3 (1900) 361; F.M. Bailey, Queensl. Fl. 5 (1902) 1467; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 66; Renner, Bot. Jahrb. Syst. 39 (1907) 280; F.M. Bailey, Compr. Cat. Qld. Pl. (1913) 485; Koord., Atlas Baumart. Java 4 (1916) t. 706; Merr., Enum. Born. (1921) 225; Ridl., Fl. Malay Penins. 3 (1924) 331; Gagnep., Fl. Indo-Chine 5 (1928) 758; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1012; Corner, Wayside Trees (1940) 678; Summerh., J. Arnold Arbor. 22 (1941) 87; Backer, Blumea 6 (1948) 305. — *Urostigma pilosum* (Blume) Miq. in Zoll., Syst. Verz. 2 (1854) 90; Fl. Ind. Bat. 1, 2 (1859) 351.

?*Ficus gonia* Buch.-Ham., Trans. Linn. Soc. 15 (1827) 137.

Ficus rupestris Buch.-Ham, Trans. Linn. Soc. 15 (1827) 139.

Ficus payapa Blanco, Fl. Filip. (1837) 683; ed. 2 (1845) 475; Náves in Blanco, Fl. Filip., ed. 3, 3 (1879) 86, t. 203; Merr., Publ. Gov. Lab. Philipp. 27 (1905) 79; Sp. Blancoan. (1918) 125; Enum. Philipp. Flow. Pl. 2 (1923) 60; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 207.

Urostigma dasycarpum Miq., London J. Bot. 6 (1847) 574, t. 23B. — *Ficus mysorensis* B. Heyne ex Roth forma *parvifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285. — *Ficus mysorensis* B. Heyne ex Roth var. *dasycarpa* (Miq.) M.F. Barrett, Am. Midl. Nat. 45 (1951) 166.

Urostigma bicorne Miq., Pl. Jungh. (1851) 47; Fl. Ind. Bat. 1, 2 (1859) 354, t. 24; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285.

Urostigma chrysothrix Miq. in Zoll., Syst. Verz. 2 (1854) 90, 96; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285.

Urostigma subappendiculatum Miq. in Zoll., Syst. Verz. 2 (1854) 90; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285.

Urostigma subcuspidatum Miq. in Zoll., Syst. Verz. 2 (1854) 91, 97; Fl. Ind. Bat. 1, 2 (1859) 335.

Ficus mysorensis B. Heyne ex Roth var. *subrepanda* Wall. ex King, Sp. Ficus 1 (1887) 20, t. 15. — *Ficus subrepanda* (Wall. ex King) King, Fl. Brit. Ind. 5 (1888) 500.

Ficus chrysochlamys Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1900) 274; Diels, Bot. Jahrb. Syst. 67 (1935) 185 (sub *F. forstenii*).

Ficus vidaliana Warb. in Perkins, Fragm. Fl. Philipp. 3 (1905) 197.

Ficus auranticarpa Elmer, Leafl. Philipp. Bot. 9 (1937) 3454; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 207. — *Ficus drupacea* Thunb. var. *auranticarpa* (Elmer) Corner, Gard. Bull. Singapore 17 (1960) 380.

Ficus drupacea Thunb. var. *glabrata* Corner, Gard. Bull. Singapore 17 (1960) 380.

Ficus drupacea Thunb. var. *pedicellata* Corner, Gard. Bull. Singapore 17 (1960) 381.

Tree up to 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 to oblong to obovate, (7–)10–20(–35) by (3–)4–8(–16) cm, coriaceous, apex short-acuminate (to rounded), base cordate to rounded; 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; cystoliths on both sides; midrib slightly prominent to flat, lateral veins (6–)8–12(–14) pairs, the basal pair distinct to hardly so, up to 1/10–1/5(–1/4) the length of the lamina, (sparsely and/or faintly) branched or unbranched, 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 a distinct median part. *Figs* axillary, in pairs or solitary, sessile; basal bracts 2 or 3, on a disc, 0.5–3 mm long, unequal in size, semicircular to band-shaped, brownish puberulous (or glabrous), persistent; receptacle ellipsoid, 1–2(–2.5) cm diam. and up to 4 cm long when dry, rarely up to 0.7 cm long stipitate, (sub)glabrous, 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). — **Fig. 116i–o.**

Distribution — Sri Lanka, India, Myanmar, S China, Indochina, Thailand to Malesia, extending to the Solomon Islands and Australia (Queensland); in *Malesia*: Sumatra (western), Malay Peninsula, Java (eastern), Lesser Sunda Islands (Alor, Flores, Wetar) Borneo (northern), Philippines, Celebes (northern), Moluccas (Ceram), and New Guinea (incl. Admiralty Islands).

Habitat — Forest, at altitudes up to c. 1000 m; sometimes planted.

Notes — 1. A form with stipitate receptacles is found in eastern New Guinea.

2. The form with hairy twigs, petioles and laminas is mainly found in the western part of the species range.

32. **Ficus dubia** Wall. ex King

Ficus dubia Wall. ex King, Sp. Ficus 1 (1887) 46, t. 56; Fl. Brit. India 5 (1888) 509; Ridl., Fl. Malay Penins. 3 (1924) 333; Corner, Wayside Trees (1940) 676; Gard. Bull. Singapore 21 (1965) 17; Kochummen, Tree Fl. Malaya 3 (1978) 146; Tree Fl. Sabah & Sarawak 3 (2000) 233.

Tree up to 30 m tall, hemi-epiphytic or (secondarily?) terrestrial, or a climber (?). *Branches* drying brown to blackish. *Leafy twigs* 2–4 mm thick, ± angular (to subterete), glabrous; periderm flaking off. *Leaves* spirally arranged; 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 flat above, lateral veins 8–10 pairs, the basal pair ± distinct, up 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 to ovoid to 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 ± shrivelled when dry; internal hairs absent. *Tepals* red. *Ovary* partly (dark) red.

Distribution — *Malesia*: Sumatra, Malay Peninsula, Borneo (northern).

Ecology — Forest, at altitudes up to 1300 m.

Note — In all specimens examined the ostiole is perforated and it is unclear how many upper ostiolar bracts there are and whether they are imbricate or not.

33. Ficus forstenii Miq.

Ficus forstenii Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 214, 285; King, Sp. Ficus 1 (1887) 29, t. 29; Koord., Versl. Minahassa (1898) 599; Merr., Enum. Born. (1921) 223; Corner, Gard. Bull. Singapore 21 (1965) 16; Kochummen, Tree Fl. Malaya 3 (1978) 147.

Ficus palawanensis Merr., Publ. Gov. Lab. Philipp. 29 (1905) 11; Elmer, Leafl. Philipp. Bot. 4 (1911) 1244; 4 (1912) 1380; 7 (1914) 2393; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 60; Philipp. J. Sci. 29 (1926) 364; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 205.

Ficus umbobracteata Elmer, Leafl. Philipp. Bot. 4 (1911) 1247; 7 (1914) 2394; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 67; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 205. — *Ficus forstenii* Miq. var. *umbobracteata* (Elmer) Corner, Gard. Bull. Singapore 17 (1960) 385.

Ficus iwahigensis Elmer, Leafl. Philip. Bot. (1912) 1381; Corner, Gard. Bull. Singapore 21 (1965) 98. — Type: *Elmer 13008* (iso K), Philippines, Palawan, Puerto Princesa, April 1911, consists of leaves of *F. depressa* Blume and figs of *F. forstenii* Miq.; the latter element is designated as lectotype here.

Ficus pacifica Elmer, Leafl. Philipp. Bot. 9 (1937) 3460; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 207. — *Ficus forstenii* Miq. var. *pacifica* (Elmer) Corner, Gard. Bull. Singapore 17 (1960) 385; Kochummen, Tree Fl. Malaya 3 (1978) 147.

Ficus forstenii Miq. var. *villosa* Corner, Gard. Bull. Singapore 17 (1960) 385; Kochummen, Tree Fl. Malaya 3 (1978) 147.

Tree up to 25 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying greyish to pale brown. *Leafy twigs* (3–)5–8 mm thick, ± angular, brownish puberulous (and glabrescent) or glabrous; periderm persistent. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)obovate, 12–20(–26) by 5–12(–14) cm, coriaceous, apex acuminate, tip acute, base rounded to cordate (with a narrow sinus) or to cuneate; upper surface minutely whitish puberulous, mainly on or also along (the lower part of) the midrib or also in the lateral veins, lower surface ± densely to (very) sparsely brownish to whitish puberulous on the (main) veins (to subglabrous); cystoliths on both sides; midrib or also the lateral veins impressed above, lateral veins 7–12(–15) pairs, the basal pair distinct, up to 1/6–1/3(–1/2) the length of the lamina, branched, 1 or 2 (or 3) 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 1.5–5.5 cm long, 2–3 mm thick, brownish to whitish puberulous, drying blackish (or brown); stipules (0.5–)1–2.5 cm long, brown to whitish (sub)sericeous to puberulous, caducous, sometimes with a distinct median part. *Figs* axillary, paired or solitary, initially enclosed up to 2 cm long calyptrate bud covers, sessile; basal bracts 3, semicircular to ovate, 6–12 mm long, ± unequal, 1 or 2 with a distinct median part or keeled, glabrous or appressed puberulous (on the median part), persistent; receptacle ellipsoid to ovoid, 1.5–2 cm diam. and up to 3 cm long when dry, (sub)glabrous, red to purple-black at maturity, apex slightly convex to flat, ostiole 2–4 mm diam., flat to prominent, closed,

the 3 upper ostiolar bracts fully imbricate, sometimes only 2 bracts visible; wall smooth or ± shrivelled when dry; internal hairs absent. *Tepals* red(dish). *Ovary* red.

Distribution — *Malesia*: Malay Peninsula, Borneo, Philippines, Celebes.

Habitat — Forest, at low altitudes.

Note — The species is rather variable, as with regard to the denseness of indumentum (on the lamina), the number of lateral veins and length of the basal lateral veins, and the ostiole (flat to prominent).

34. **Ficus glaberrima** Blume

Ficus glaberrima Blume, Bijdr. (1825) 451; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 263, 286; King, Sp. Ficus 1 (1887) 37, t. 43k; Fl. Brit. India 5 (1888) 506; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 75; Renner, Bot. Jahrb. Syst. 39 (1907) 381; Koord., Atlas Baumart. Java 4 (1916) t. 710, 711; F. Heide, Ann. Jard. Bot. Buitenzorg 38 (1927) 115, t. 7, 8; Gagnep., Fl. Indo-Chine 5 (1928) 770; Merr., Lingn. Sci. J. 16 (1937) 79; J. Arnold Arbor. 33 (1952) 225; Backer & Bakh.f., Fl. Java 2 (1965) 33; Corner, Gard. Bull. Singapore 21 (1965) 17. — *Urostigma glaberrimum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 340.

Ficus bistipulata Griff., Notul. 4 (1854) 398; Ic. Pl. Asiat. 4 (1854) t. 559.

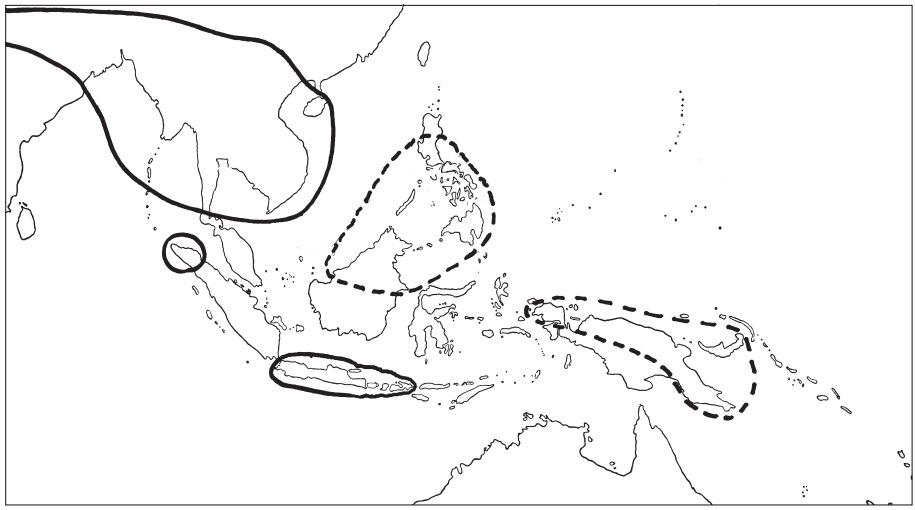
Ficus thomsonii Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 215, 286; Kurz, Forest Fl. Burma 2 (1877) 443.

Ficus fraterna Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 217, 287.

Ficus feddei H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 9 (1911) 19; Rehder, J. Arnold Arbor. 17 (1936) 73.

Ficus kingiana H. Lév., Fl. Kouy-Tchéou (1914/1915) 431 (p.p. *Cavalerie 2172*), non Hemsl. 1897; Rehder, J. Arnold Arbor. 17 (1936) 73.

Tree up to 30 (or more) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying greyish to brown. *Leafy twigs* 2–3 mm thick, ± angular, glabrous or sparsely



Map 18. Distribution of some species of subg. *Urostigma* subsect. *Conosycea*: *F. glaberrima* Blume (continuous lines); *F. lawesii* King (broken lines).

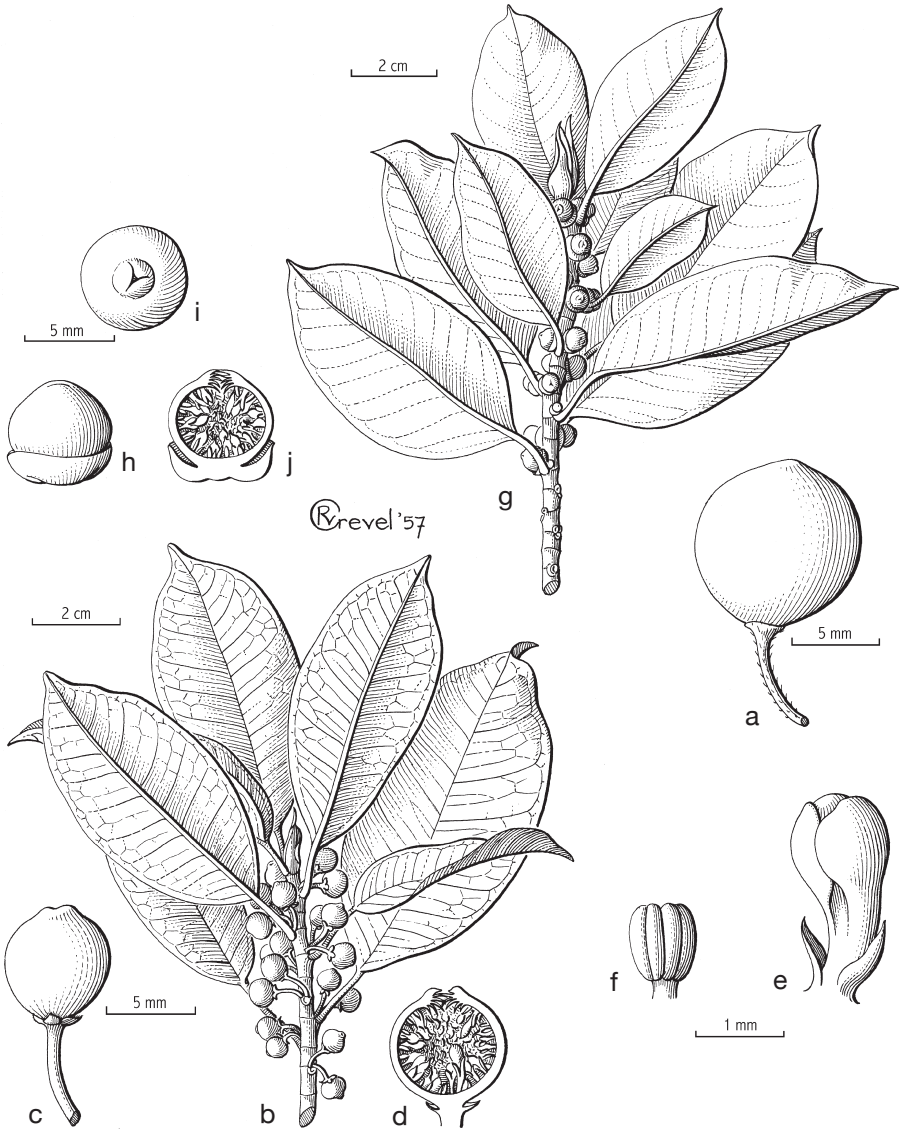


Fig. 118. a: *Ficus glaberrima* Blume, fig. — b–f: *Ficus lawesii* King. b. Leafy twigs with figs; c. & d. figs; e. staminate flower; f. stamen. — g–j: *Ficus patellata* Corner. g. Leafy twig with figs; h. fig; i. ostiole; j. fig (a: collection unknown; b–f: *Hoogland 3748*; g–j: *Aet 141*).

minutely whitish puberulous; periderm persistent. *Leaves* spirally arranged; lamina oblong, 6–15(–21) by 2.5–5.5(–8.5) cm, coriaceous, apex acuminate to subacute (to subcaudate), base cuneate to rounded; both surfaces glabrous; midrib slightly prominent to flat above, lateral veins 6–9(–10) pairs, the basal pair distinct, up to 1/10–1/6 the length of the lamina, unbranched, tertiary venation reticulate; waxy gland at the base of

the midrib; petiole 1–3(–5) cm long, 1–2 mm thick, glabrous, drying brown to blackish; stipules 1–1.5(–1.7) cm long, (sub)glabrous, caducous. *Figs* axillary, paired (or solitary); peduncle 0.3–1.2 cm long; basal bracts 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* pinkish. *Ovary* partly red. — **Fig. 118a; Map 18.**

Distribution — India, Myanmar (incl. Andaman Islands), southern China (incl. Hainan), Indochina, Thailand; in *Malesia*: Sumatra (northern), Java, Lesser Sunda Islands (Sumbawa).

Habitat — Forest, at altitudes up to 1700 m.

Notes — 1. Variety *bracteata* Corner (Gard. Bull. Singapore 17 (1960) 388; 21 (1965) 17) is included in *F. lawesii*, which is reinstated as a species; see also p. 664.

2. The absence in the Malay Peninsula is remarkable.

3. According to Corner's description, the basal bracts form a 3–4 mm long calyptrate structure before they are shed.

35. **Ficus globosa** Blume

Ficus globosa Blume, Bijdr. (1825) 449; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 262, 285; King, Sp. Ficus 1 (1887) 27, t. 25; Fl. Brit. India 5 (1888) 503; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 88; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 361; Koord., Atlas Baumart. Java 4 (1916) t. 718; Merr., Enum. Born. (1921) 224; Ridl., Fl. Malay Penins. 3 (1924) 333; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1010; Corner, Gard. Bull. Singapore 17 (1960) 380; Backer & Bakh.f., Fl. Java 2 (1965) 22, 30, 33; Corner, Gard. Bull. Singapore 21 (1965) 12; Kochummen, Tree Fl. Malaya 3 (1978) 147; Tree Fl. Sabah & Sarawak 3 (2000) 246. — *Urostigma globosum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 335.

Urostigma onustum Wall. ex Miq., London J. Bot. 6 (1847) 575; Fl. Ind. Bat. 1, 2 (1859) 336. — *Ficus onusta* (Wall. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 285 (p.p.); Kurz, Forest Fl. Burma 2 (1877) 441; Corner, Gard. Bull. Singapore 17 (1960) 380; 21 (1965) 12, 98. — Type: *Wallich 4563*, Malaysia, Penang, 1822 (K-Wall., herb. Hook.), consists of leaves of *F. globosa* Blume and figs of *F. pisocarpa* Blume; the former element is designated as lectotype here.

Urostigma manok Miq. in Zoll., Syst. Verz. 2 (1854) 90, 96; Fl. Ind. Bat. 1, 2 (1859) 337. — *Ficus manok* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 261, 285. — *Ficus globosa* Blume var. *manok* (Miq.) King, Sp. Ficus 1 (1887) 27.

Climber, or hemi-epiphytic shrub or treelet. *Branches* drying yellowish to brown. *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 to lanceolate), (5–)10–20(–26) by (2–)5–9(–11) cm, coriaceous, apex acuminate, base rounded to obtuse to subcordate or to cuneate; upper surface glabrous, lower surface glabrous; cystoliths on both sides; midrib flat to slightly impressed above, lateral veins 6–14 pairs, the basal pair ± distinct, up 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 0.5–1.5(–6) 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 up to 0.8 cm long calyptrate bud covers; peduncle 0.2–0.7 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, c. 1.5 cm diam. when fresh, with dark sparse to dense brown appressed indumentum (scurfy), greenish (?) at maturity, apex slightly convex to flat to 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. — **Map 16.**

Distribution — Myanmar, Thailand; in *Malesia*: Sumatra (incl. Riouw, Lingga, Banka), Malay Peninsula, Java, Borneo.

Habitat — Forest, often along rivers and swamps and mangroves, at altitudes up to 1200 m.

Note — The presence of dark brown appressed minute hairs on the leafy twigs and fig receptacles is characteristic. Similar indumentum is found in some other species, in particular *F. kochummeniana*.

36. **Ficus involucrata** Blume

Ficus involucrata Blume, Bijdr. (1825) 447; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; King, Sp. Ficus 1 (1887) 34, t. 38; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 94; Koord., Atlas Baumart. Java 4 (1916) t. 722; Meijer, Penggemar Alam 38 (1959) 2, f. 1; Backer & Bakh.f., Fl. Java 2 (1965) 34; Corner, Gard. Bull. Singapore 21 (1965) 18; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 231. — *Urostigma involucratum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 344.

Urostigma tjiela Miq. var. *sundaicum* Miq., Pl. Jungh. (1851) 50; Fl. Ind. Bat. 1, 2 (1859) 345; King, Sp. Ficus 1 (1887) 39.

Ficus macrocalyx Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 217, 287.

Tree, large, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown. *Leafy twigs* 3–5 mm thick, ± angular, minutely white puberulous or glabrous; periderm persistent. *Leaves* spirally arranged; lamina elliptic to oblong (or to (sub)ovate), (6–)10–15(–19) by (2.5–)4–7(–9) cm, coriaceous, apex acuminate, the acumen acute, base cuneate to obtuse (to rounded); upper surface glabrous, lower surface glabrous (or minutely white puberulous on the midrib); cystoliths on both sides; midrib slightly prominent but towards the base impressed above, lateral veins 6–10 pairs, the basal pair distinct, up to 1/6–1/3 the length of the lamina, unbranched, departing from the midrib 0.2–0.5(–1) cm above the base of the lamina, 0–1(–3) pairs of smaller lateral veins below the main pair, tertiary venation reticulate; waxy gland at the base of the midrib; petiole (1.5–)2–4 cm long, 1.5–2.5 mm thick, glabrous, drying brown; stipules (1.5–)2–3 cm long, (minutely) white puberulous or glabrous, caducous, usually with a distinct median part. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 5–15(–18) mm long, mostly (almost) equal, ovate with an obtuse to rounded apex, covering 1/2–3/4 of the receptacle, often keeled and/or with a distinct median part, puberulous or glabrous, persistent; receptacle ovoid to ellipsoid, 1–1.3 cm diam. when dry, (sub)glabrous, yellow to red at maturity, apex convex to flat, ostiole 2–4 mm diam., slightly prominent to flat, closed, the 3 upper ostiolar bracts fully imbricate; wall ± smooth to ± shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* red.

Distribution — *Malesia*: Java.

Habitat — Forest; at altitudes between 500 and 1700 m.

Note — This species resembles *F. crassiramea* in the basal bracts which cover the greater part of the receptacle. However, the receptacle is always longer than wide, and the acumen of the lamina is acute. The species is in most features similar to *F. sundaica* and might even be conspecific, being a form with much longer basal bracts than normal in *F. sundaica*.

37. Ficus juglandiformis King

Ficus juglandiformis King, Sp. Ficus 1 (1887) 28, t. 27; Corner, Gard. Bull. Singapore 21 (1965) 16.

Tree, large, hemi-epiphytic. *Branches* drying brown. *Leafy twigs* 5–8 mm thick, ± angular, glabrous; periderm persistent. *Leaves* spirally arranged; lamina elliptic, 10–21 by 5–12.5 cm, coriaceous, apex short-acuminate, base rounded to cuneate; both surfaces glabrous; cystoliths on both sides; midrib impressed above, lateral veins 8–12 pairs, the basal pair distinct, up to 1/8–1/3 the length of the lamina, branched, tertiary venation partly parallel to the lateral veins to reticulate, ± prominent; waxy gland at the base of the midrib; petiole 2.5–5.5 cm long, 4–5 mm thick, glabrous, drying brown; stipules (1.5–)2–4 cm long, glabrous, caducous sometimes with a distinct median part. *Figs* axillary, paired (or solitary), sessile, calyptrate bud covers absent (?); basal bracts 3, 8–10 mm long, ± unequal, ovate with an obtuse apex, (1 or) 2 with a distinct median part or keeled, glabrous, persistent; receptacle ellipsoid to obovoid, 1.5–2.5 cm diam. and 2.5–3 cm long when dry, glabrous, colour at maturity unknown, apex ± convex to submammillate, ostiole c. 5 mm diam., prominent, closed, the 3 upper ostiolar bracts fully imbricate; wall ± shrivelled when dry; internal hairs absent. *Tepals* red. *Ovary* red (?).

Distribution — *Malesia*: Sumatra (western).

Habitat — Forest, submontane, rare.

38. Ficus kerkhovenii Valeton

Ficus kerkhovenii Valeton in Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 84; Koord., Atlas Baumart. Java 4 (1916) t. 714; Corner, Wayside Trees (1940) 680, f. 251, t. 200 ('Johore Fig'); Vreede, Ann. Bot. Gard. Buitenzorg 51 (1949) 146; Backer & Bakh.f., Fl. Java 2 (1965) 31 (sub *F. altissima* Blume); Corner, Gard. Bull. Singapore 21 (1965) 15; Kochummen, Tree Fl. Malaya 3 (1978) 149; Tree Fl. Sabah & Sarawak (2000) 233.

Ficus lamaoensis Merr., Philipp. J. Sci. 18 (1921) 56; Enum. Philipp. Flow. Pl. 2 (1923) 55; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 203.

Tree up to 45 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown. *Leafy twigs* 2–4 mm thick, ± angular, glabrous; periderm persistent. *Leaves* spirally arranged; 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 flat above, lateral veins 7–12 pairs, the basal pair hardly or not distinct, up to 1/20–1/10 the length of the lamina, unbranched, often shorter than the other lateral veins and often not opposite, 0 or 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(–3) cm long, 1.5–2.5 mm thick, glabrous, drying blackish; stipules

Fig. 119. *Ficus kerkhovenii* Valeton. Tree established as hemi-epiphyte low down on the trunk of a durian-tree (now dead), Malaysia, Johore. Photo E.J.H. Corner.

Fig. 120. *Ficus kerkhovenii* Valeton. Base of the tree of Fig. 119. Photo E.J.H. Corner.

Fig. 121. *Ficus kerkhovenii* Valeton. Base of root-trunk of a tree established in forest, Malaysia, Johore. Photo E.J.H. Corner.

(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 and to slightly shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red. — **Fig. 119, 120, 121.**

Distribution — *Malesia*: Sumatra (incl. Banka and Riouw), Malay Peninsula, Java, Borneo, Philippines (Luzon?).

Habitat — Forest, at low altitudes.

Note — According to Corner (1965: 15) the species is also present in the Philippines (Luzon), but that cannot be confirmed.

39. Ficus kochummeniana C.C. Berg

Ficus kochummeniana C.C. Berg, Blumea 49 (2004) 468.

Ficus retusa L. var. *borneensis* Corner, Gard. Bull. Singapore 17 (1960) 393; 21 (1965) 20; Kochummen, Tree Fl. Malaya 3 (1978) 154; Tree Fl. Sabah & Sarawak 3 (2000) 298.

Tree up to 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 3–5(–7) mm thick, ± angular, minutely white puberulous

and with dark brown hairs; periderm persistent. *Leaves* spirally arranged; lamina subobovate to obovate (to oblanceolate to oblong or to 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 6–8 pairs, often ± impressed above, the basal pair distinct, up to 1/3–1/2(–2/3) the length of the lamina, unbranched, 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, subpersistent or caducous. *Figs* axillary, paired (or solitary), often crowded, sessile; basal bracts 3, 3–5 mm long, (sub)equal, with dark brown hairs, glabrescent, persistent; receptacle subglobose, 0.5–0.8 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, the 3 upper ostiolar bracts fully imbricate; wall (almost) smooth when dry; internal hairs absent. *Tepals* red(dish). *Ovary* reddish to whitish.

Distribution — Thailand; in *Malesia*: Sumatra (western), Malay Peninsula, Borneo.

Habitat — Forest, at low altitudes.

Note — This species differs from *F. retusa*, in which it was included as var. *borneensis*, e.g., in the longer petioles, the conspicuously prominent tertiary venation, the ± impressed lateral veins, the often acuminate apex of the lamina, and the often subpersistent stipules.

40. Ficus kurzii King

Ficus kurzii King, Sp. Ficus 1 (1887) 47, t. 57; Fl. Brit. India 5 (1888) 509; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 463; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 124; Koord., Atlas Baumart. Java 4 (1916) t. 737–739; Backer & Bakh.f., Fl. Java 2 (1965) 23; Corner, Gard. Bull. Singapore 21 (1965) 18; Kochummen, Tree Fl. Malaya 3 (1978) 149.

?*Ficus euphylla* Kurz, Forest Fl. Burma 2 (1877) 445 (or *F. talbotii* King?).

Ficus nuda (Miq.) Miq. var. *macrocarpa* Kurz, Forest Fl. Burma 2 (1877) 446.

Tree up to 10(–30) m tall, hemi-epiphytic or (secondarily?) terrestrial with copious aerial roots from the branches. *Branches* drying brown. *Leafy twigs* 2–4 mm thick, ± 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; both surfaces glabrous; midrib slightly prominent in the lower part to flat in the upper part of the lamina, lateral veins 8–10 pairs, the basal pair ± distinct, up 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, c. 0.5

mm long, unequal in size and shape, glabrous, persistent (or caducous?); receptacle subglobose, 0.5–0.8 cm diam. when dry, often substipitate (or up to 1 cm long stipitate), glabrous, ± pustulate, dark cherry-red to crimson-purple to black 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.

Distribution — Myanmar, S China, Thailand, Indochina; in *Malesia*: Sumatra, Malay Peninsula, Java.

Habitat — Forest, at low altitudes; sometimes planted.

Notes — 1. This species is in most features similar to *F. benjamina*. It differs in the midrib which is ± prominent above (at least in the lower part of the lamina), whereas it is slightly impressed (at least in the lower part of the lamina) in *F. benjamina*. Moreover, the leafy twigs, stipules, and figs are mostly blackish when dry, whereas mostly pale-coloured in *F. benjamina*. The receptacle tends to be stipitate (or is clearly stipitate) and the fig becomes black at full maturity. This species occurs scattered in the western aprt of the range of distribution of *F. benjamina* and is rather poorly represented in herbarium collections. It is somewhat doubtful whether this taxon should be regarded as distinct at the species level.

2. Material in cultivation in Latin America and Hawaii which I have identified as *F. kurzii*, almost certainly represent a distinct species of which I have not yet encountered a matching Asian collection.

3. A record that this species occurs in the Lesser Sunda Islands (Lombok), as indicated by Corner (1965), is not found in L.

41. Ficus lawesii King

Ficus lawesii King, J. Asiat. Soc. Bengal 55, 2 (7 March 1887) 403; King, Sp. Ficus App. (1889) 4, t. 228; Diels, Bot. Jahrb. Syst. 67 (1935) 182.

Ficus adamii Elmer, Leafl. Philipp. Bot. 4 (1911) 1258 (‘*adamsii*’), 1521; 7 (1914) 2410; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 209, f. 8; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 44; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 184.

Ficus villamilii Merr. ex Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 183.

Tree up to 35 m tall, hemi-epiphytic or (secondarily?) terrestrial, sometimes a climber. *Branches* drying pale brown to greyish. *Leafy twigs* 2–4 mm thick, ± angular, glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic, (4–)6–18 by (1.5–)2.5–7.5(–9) cm, coriaceous, apex acuminate to subacute, base cuneate to rounded; both surfaces glabrous; midrib slightly prominent to flat above, lateral veins (8–)10–14 pairs, the basal pair ± to hardly distinct, up to 1/10–1/6 the length of the lamina, unbranched, tertiary venation reticulate; waxy gland at the base of the midrib; petiole 1–5 cm long, 1–2 mm thick, glabrous, drying blackish; stipules (0.5–)1–2(–3) cm long, glabrous, caducous. *Figs* axillary or just below the leaves, 2–4 together (or solitary); peduncle 0.7–1.2 cm long; basal bracts 3, 0.5–1.5 mm long, glabrous, persistent, often ± reflexed; receptacle subglobose, 0.4–0.7(–1) cm diam. when dry, glabrous, yellow to orange at maturity, apex convex to submammillate, ostiole 2–2.5 mm diam., prominent, closed, the 3 upper ostiolar bracts fully imbricate, only

2 visible; wall smooth (or ribbed) when dry; internal hairs absent. *Tepals* red. *Ovary* partly (dark) red. — **Fig. 118b–f; Map 18.**

Distribution — India; in *Malesia*: Philippines (Luzon, Mindanao), Borneo (Sarawak; Kalimantan: Kutai), Moluccas (Halmahera), New Guinea; common in New Guinea, less common or rare elsewhere.

Habitat — Forest, at altitudes up to 1000 m.

Notes — 1. This species is closely related to *F. glaberrima*, from which it differs in the more numerous lateral veins, the presence of up to four figs in the same leaf axil, the persistent basal bracts, and the two (visible) upper ostiolar bracts. In material from the Philippines, the figs are sometimes 0.8–1 cm diam. when dry and the figs possibly occur less often in groups of four in the leaf axils.

2. Two collections from New Guinea (including the type *F. lawesii*) with 'galled' pistillate flowers deviate by having the figs solitary, the figs (sub)sessile and stipitate, and the ostiole with 3 or 4 bracts visible. They match in their vegetative features the normal specimens included.

3. *Ficus travancorica* King is based on material from Peninsular India, *F. lawesii* and the two names based on material from the Philippines were included in *F. glaberrima* Blume var. *bracteata* Corner (Gard. Bull. Singapore 17 (1960) 388). It is somewhat doubtful whether the Malesian material currently under *F. lawesii* and the material from India as well as some similar collections from Thailand belong to the same species.

42. Ficus lowii King

Ficus lowii King, Sp. Ficus 1 (1887) 32, t. 33; Fl. Brit. India 5 (1888) 504; Ridl., Fl. Malay Penins. 3 (1924) 332; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1011; Corner, Gard. Bull. Singapore 21 (1965) 18; Kochummen, Tree Fl. Malaya 3 (1978) 150.

Ficus lowii King var. *minor* Corner, Gard. Bull. Singapore 17 (1960) 389.

Tree up to c. 30 m tall, hemi-epiphytic or a climber (?). *Branches* drying brown. *Leafy twigs* 3–5 mm thick, ± angular, glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to lanceolate, 14–23 by 4–10 cm, coriaceous, apex acuminate, base rounded to obtuse, margin revolute; upper surface glabrous, lower surface (very) minutely white puberulous on the midrib or also on the lateral veins; midrib ± impressed above, lateral veins 7–10 pairs, the basal pair distinct, up to 1/6–1/4 the length of the lamina, unbranched (or faintly branched), often running parallel to the margin, tertiary venation reticulate to partly parallel to the lateral veins; waxy gland at the base of the midrib; petiole 3–4 cm long, 2–3 mm thick, (very) minutely white puberulous to subglabrous, drying brown; stipules 2–3 cm long, very minutely puberulous to subglabrous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 1–3 mm long, ± unequal in shape and size, glabrous, persistent; receptacle subglobose to ovoid to ellipsoid, 1.2–1.6 cm diam. when dry, glabrous, red at maturity, apex convex to submammillate, ostiole 3–4 mm diam., (almost) flat, closed, the 3 upper ostiolar bracts fully imbricate, sometimes only 2 bracts visible; wall shrivelled when dry; internal hairs absent. *Tepals* red. *Ovary* partly red. — **Fig. 122.**

Distribution — *Malesia*: Malay Peninsula.

Habitat — Forest, at altitudes up to c. 1000 m

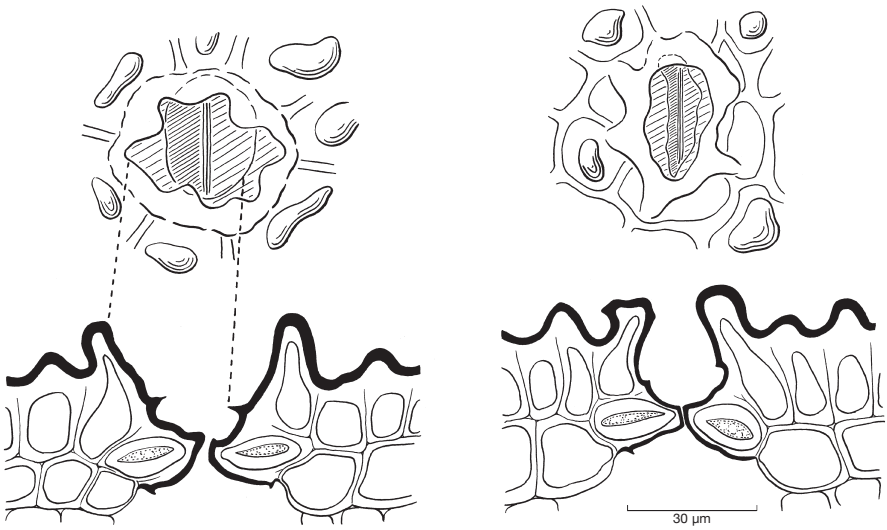


Fig. 122. *Ficus lowii* King. Stomata and papillate epidermis (collection unknown).

43. **Ficus maclellandii** King

Ficus maclellandii King, Sp. Ficus 1 (1887) 52, t. 64; Fl. Brit. India 5 (1888) 512; Corner, Gard. Bull. Singapore 21 (1965) 19; Kochummen, Tree Fl. Malaya 3 (1978) 150.

Ficus thorelii Gagnep., Notul. Syst. (Paris) 4 (1927) 97; Fl. Indo-Chine 5 (1928) 781.

Urostigma rhododendrifolium Miq., London J. Bot. 6 (1847) 579. — *Ficus rhododendrifolia* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286, non Kunth & C.D. Bouché 1847; King, Sp. Ficus 1 (1887) 57, t. 58. — *Ficus maclellandii* King var. *rhododendrifolia* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 392.

Tree up to 25 m tall, hemi-epiphytic or terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 1.5–2.5 mm thick, ± angular to subterete, glabrous, or yellowish hairy on the upper scars of the stipules; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic or to lanceolate or to (sub)ovate, (7–)10–18 by (3–)4–7 cm, coriaceous, apex acuminate to subcaudate, base cuneate to rounded, margin flat; both surfaces glabrous; midrib (at least the lower part) ± impressed above, lateral veins 8–14 pairs, the basal pair slightly or not distinct, up to 1/20–1/6 the length of the lamina, unbranched, 0 or 1 pairs of smaller lateral veins below the (main) pair, tertiary 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, glabrous, drying blackish; stipules 0.5–1 cm long, yellowish subsericeous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 1–3 mm long, (sub)equal to ± unequal in size and shape, appressed-puberulous or glabrous, persistent; receptacle subglobose, 0.5–1(–1.1) cm diam. when dry, (sub)glabrous, yellow to red 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 absent. *Tepals* reddish. *Ovary* partly red.

Distribution — NE India, Myanmar, S China (Yunnan), Indochina (Laos), Thailand; in *Malesia*: Malay Peninsula (Kedah).

Habitat — Forest, at low altitudes (often on limestone?).

Note — This species is probably closely related to *F. binnendijkii* and can be distinguished by the yellow hairs on the stipules and the (upper rim of the) scars of the stipules.

44. Ficus microcarpa L.f.

Ficus microcarpa L.f., Suppl. Pl. (1782) 442; Lam., Encycl. 2, 2 (1788) 500; Blume, Rumphia 1 (1836) 19, 20; Náves in Blanco, Fl. Filip., ed. 3 (1879) t. 382 (lower left); Corner, Gard. Bull. Singapore 17 (1960) 397; 21 (1965) 22; Backer & Bakh.f., Fl. Java 2 (1965) 34, 35; Corner, Rev. Handb. Fl. Ceyl. 1, 2 (1977) 141, t. 16; Kochummen, Tree Fl. Malaya 3 81978) 151. — *Urostigma microcarpum* (L.f.) Miq., London J. Bot. 6 (1847) 583; Fl. Ind. Bat. 1, 2 (1859) 346.

[*Itti-arealou* Rheede, Hort. Mal. 3 (1682) 69, t. 55.]

Ficus aggregata Vahl, Enum. Pl. 2 (1805) 191.

Ficus rubra Roth, Nov. Pl. Sp. (1821) 391, non Vahl 1805.

Ficus littoralis Blume, Bijdr. (1825) 455; Rumphia 1 (1836) 19. — *Urostigma littorale* (Blume) Miq. in Zoll., Syst. Verz. 2 (1854) 91.

Ficus condoravia Buch.-Ham., Trans. Linn. Soc. 15 (1826) 131; Miq., London J. Bot. 6 (1847) 580 (sub *Urostigma pisiferum* Miq.); King, Fl. Brit. India 5 (1888) 180.

Urostigma amblyphyllum Miq., London J. Bot. 6 (1847) 569. — *Ficus amblyphylla* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286.

Urostigma pisiferum Miq., London J. Bot. 6 (1847) 580. — *Ficus retusa* L. var. *pisifera* (Miq.). Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 288.

Urostigma accedens Miq. var. *latifolia* Miq., Fl. Ind. Bat. 1, 2 (1859) 347. — *Ficus dilatata* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 218, 288. — *Ficus microcarpa* L.f. var. *latifolia* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 398.

Ficus dyctiophleba F. Muell. ex Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 218, 288 (indice *F. dyctiophylla*); Benth., Fl. Austral. 6 (1873) 170; F.M. Bailey, Queensl. Fl. 5 (1902) 1472; Compr. Cat. Qld. Pl. (1913) 486.

Ficus retusa L. forma *parvifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 267.

Ficus naumannii Engl., Bot. Jahrb. Syst. 7 (1886) 451. — *Ficus microcarpa* L.f. var. *naumannii* (Engl.) Corner, Gard. Bull. Singapore 17 (1960) 398.

Ficus thynneana F.M. Bailey, Queensl. Agr. J. 1 (1897) 231, with t.; Queensl. Fl. 5 (1902) 1469; Compr. Cat. Qld. Pl. (1913) 486, f. 474; Domin, Bibl. Bot. 89 (1921) 563.

Ficus dahlii K. Schum., Notizbl. Bot. Gart. Berlin-Dahlem 2 (1898) 111; Lauterb. & K. Schum. in K. Schum. & Lauterb., Fl. Schutzgeb. Südsee (1900) 274; Diels, Bot. Jahrb. Syst. 67 (1935) 182.

Ficus cairnsii Warb., Feddes Repert. Spec. Nov. Regni Veg. 1 (1905) 73.

Ficus retusiformis H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8 (1910) 549; Rehder, J. Arnold Arbor. 17 (1936) 74.

Ficus thynneana F.M. Bailey var. *minor* Domin, Bibl. Bot. 89 (1921) 563.

Ficus regnans Diels, Bot. Jahrb. Syst. 67 (1935) 182; Summerh., J. Arnold Arbor. 22 (1941) 85.

Ficus retusa L. var. *crassifolia* W.C. Shieh, Quart. J. Taiwan Mus. 16 (1963) 190, t. 5. — *Ficus microcarpa* L.f. var. *crassifolia* (W.C. Shieh) J.C. Liao, Ser. Publ. Forest. Exp. Forest NTU 62 (1974) 79; Taxon. Rev. Moraceae Taiwan, ed. 2 (1995) 56, t. 20.

Ficus microcarpa L.f. var. *fuyuensis* J.C. Liao, Quart. J. Exp. Forest NTU 3 (1989) 84, t. 3; Taxon. Rev. Moraceae Taiwan, ed. 2 (1995) 56, t. 21.

Ficus microcarpa L.f. var. *oluangpiensis* J.C. Liao, Quart. J. Exp. Forest NTU 3 (1989) 85, t. 4; Taxon. Rev. Moraceae Taiwan, ed. 2 (1995) 59, t. 22.

Ficus microcarpa L.f. var. *pusillifolia* J.C. Liao, Quart. J. Exp. Forest NTU 3 (1989) 85, t. 5; Taxon. Rev. Moraceae Taiwan, ed. 2 (1995) 59, t. 22.

Ficus benjamina auct. non L.: Thunb., Diss. Fic. (1786) 5, 11, 15; Lour., Fl. Coch. (1790) 665; Willd., Sp. Pl. 4 (1806) 1143; Roxb., Fl. Ind., ed. Carey 3 (1832) 550; de Vriese, Tuinb. Fl. 1 (1855) 143.

Ficus nitida auct. non Thunb (1786): Blume, Bijdr. (1825) 455. — *Urostigma nitidum* (Thunb.) Miq., London J. Bot. 6 (1847) 582; Fl. Ind. Bat. 1, 2 (1859) 345. — *Ficus retusa* L. var. *nitida* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 267, 288.

Ficus nitida auct. non Thunb.: Wight, Ic. 2 (1843) t. 642; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 250.

Ficus retusa auct. non L.: Miq., London J. Bot. 6 (1847) 582 (sub *Urostigma*); Fl. Ind. Bat. 1, 2 (1859) 345 (sub *Urostigma*); Benth., Fl. Hongk. (1861) 327; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 267, 288; Benth., Fl. Austral. 6 (1873) 166; Kurz, Forest Fl. Burma 2 (1877) 444; Náves & Fern.-Vill., Nov. App. (1880) 199; King, Sp. Ficus 1 (1887) 50, t. 61, 62; Fl. Brit. India 5 (1888) 511; Watt, Dict. Econ. Prod. India 3 (1890) 360; Trimen, Fl. Ceyl. 4 (1898) 89; Koord., Versl. Minahassa (1898) 606; F.B. Forbes & Hemsl., J. Linn. Soc. Bot. 26 (1899) 466; Becc., For. Borneo (1902) 525; F.M. Bailey, Queensl. Fl. 5 (1902) 1469; Merr., Bull. Bur. For. Philipp. 1 (1903) 18; Philipp. J. Sci., 1, Suppl. (1906) 47; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 112; Renner, Bot. Jahrb. Syst. 39 (1907) 382; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 361; F.M. Bailey, Compr. Cat. Qld. Pl. (1913) 486; Koord., Atlas Baumart. Java 4 (1916) t. 732, 733; Domin, Bibl. Bot. 89 (1921) 563; Merr., Enum. Born. (1921) 226; Enum. Philipp. Flow. Pl. 2 (1923) 63; Ridl., Fl. Malay Penins. 3 (1924) 335; Gagnep., Fl. Indo-Chine 5 (1928) 764; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1014; Campos Porto, Rodriguesia 1 (1935) 77, f. 1, 2; Diels, Bot. Jahrb. Syst. 67 (1935) 182; 69 (1938) 398; Alston, Kandy Fl. (1938) 34, f. 182; Corner, Wayside Trees (1940) 679, t. 207; Summerh., J. Arnold Arbor. 22 (1941) 86; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 22, 198; M.F. Barrett, Bull. Torrey Bot. Club 76 (1949) 53; Vreede, Ann. Bot. Gard. Buitenzorg 51 (1949) 146; Condit, Lasca Leaves 8 (1958) 14–17; Worth., Ceylon Trees (1959) f. 415.

Tree up to 30 m tall or shrub, hemi-epiphytic or (secondarily?) terrestrial, with copious aerial roots on the branches. *Branches* drying brown. *Leafy twigs* 2–3 mm thick, ± angular, glabrous or (very) minutely white puberulous; periderm mostly flaking off. *Leaves* spirally arranged; lamina oblong to elliptic to subobovate or to suborbicular, 2–10(–14) by 1–5(–8) cm, coriaceous, apex short-acuminate (with the acumen usually obtuse) to subacute to obtuse or to rounded, base cuneate to obtuse or to rounded (to subcordate), margin flat or ± revolute towards the base, mostly ± callose towards the base; both surfaces glabrous; midrib flat to slightly prominent or (at least the lower part) ± impressed above, lateral veins (3–)4–8(–10) pairs, the basal pair distinct, up to (1/5–)1/4–1/3(–1/2) the length of the lamina, unbranched, straight (or in broadly elliptic to suborbicular laminas curved), tertiary largely parallel to the lateral veins, basal and other lateral veins and the tertiary venation running in the same direction and departing in acute angles from the midrib, but in broadly elliptic to suborbicular laminas, the basal lateral veins running in a direction ± different from the other venation and the angles of departure broader; waxy gland at the base of the midrib; petiole 0.5–1(–3) cm long, 1–1.5 mm thick, glabrous, 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 or up to 0.5 cm long pedunculate; 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, 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,

Fig. 123. *Ficus microcarpa* L.f. Tree in its typical habitat of tidal freshwater swamp forest with *Pandanus helicopus*. Photo E.J.H. Corner.

on a low rim; wall smooth; internal hairs present, white, abundant to sparse or absent. *Tepals* red but towards the margins white or entirely whitish (or reddish). *Ovary* partly (or entirely) red. — **Fig. 108j–q, 123, 124a–g.**

Distribution — Sri Lanka, through India and China to S Japan and the Ryukyu Islands and through Thailand to Malesia extending to the Solomon Islands and Australia (Queensland), also in the Bonin Islands, Christmas Island and Cocos Island, and the Carolines (Palau and Truk Islands); in *Malesia*: Sumatra, Malay Peninsula, Java (incl. Christmas Island), Lesser Sunda Islands (Alor, Bali, Flores, Sumbawa), Borneo, Philippines, Celebes (incl. Sangi and Talaud Islands) Moluccas (Morotai, Halmahera, Ternate, Buru, Ceram, Ambon, Kai Islands), New Guinea (incl. New Britain and New Ireland).

Habitat — Forest, along rivers, on cliffs, and in coastal vegetation, at altitudes up to c. 1200 m.

Notes — 1. The species is quite variable. In the western part of the Malesian region, it is rather uniform with the lamina elliptic to oblong to subobovate with a cuneate to obtuse base and an acuminate to obtuse apex. The petiole is usually up to 1 cm long, but in the Philippines, Tanimbar Islands, and some of the Lesser Sunda Islands, it is often longer, up to 2 (or 3) cm. The figs are sessile, the upper ostiolar bracts are just not fully imbricate, internal hairs are present, and the tepals are usually partly dark red.

In the eastern part of the region, the lamina is often broadly elliptic to suborbicular and then often with rounded apex and a rounded base (as in E Java, Mindanao (Philippines), Celebes, Moluccas, New Guinea, and also in Australia (Queensland), Bonin Islands, Ryukyu Islands, and Taiwan). Moreover, the lamina is sometimes large, longer than 10 cm long and more than 5 cm broad (in Celebes, Moluccas, Sumbawa, and New Guinea). The figs are in eastern New Guinea (and the Solomon Islands) pedunculate

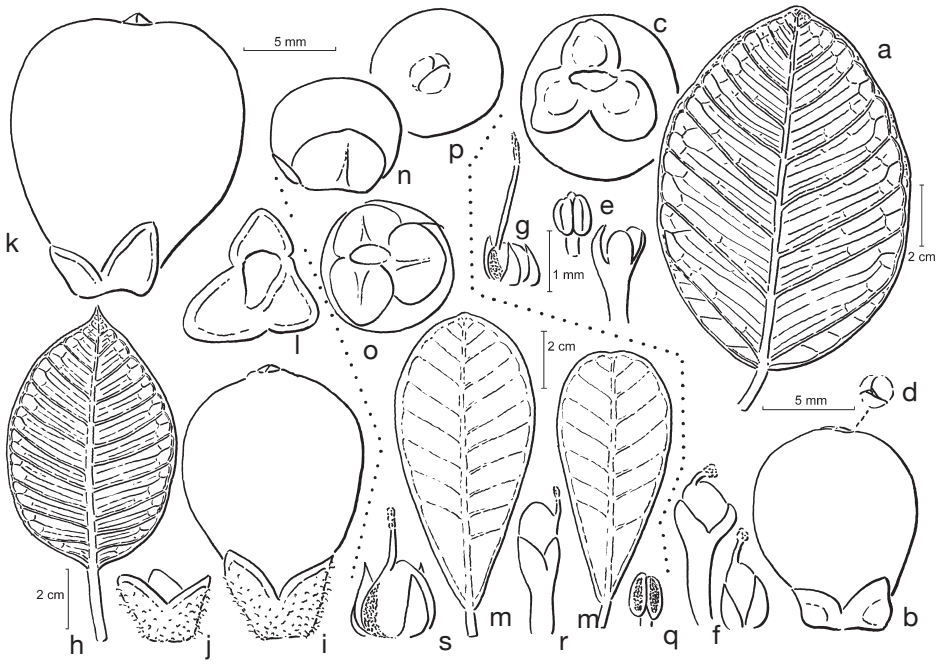


Fig. 124. a–g: *Ficus microcarpa* L.f. a. Leaf; b. fig; c. basal bracts; d. ostiole; e. staminate flower, separate perianth and stamen; f. short-styled flowers; g. long-styled flower. — h–l: *Ficus subcordata* Blume. h. Leaf; i, k. figs: j, l. basal bracts. — m–s: *Ficus tristaniifolia* Corner. m. Leaves; n. fig; o. basal bracts; p. ostiole; q. stamen; r. short-styled flower; s. long-styled flower (all: collections used unknown). From Philos. Trans., Ser. B, 281 (1978) 364.

to subsessile with caducous basal bracts (var. *naumannii*); the receptacles of those in Celebes and the Moluccas are often relatively large, 0.8–1 cm diameter. The upper ostiolar bracts are usually just fully imbricate, the internal hairs often absent (or very sparse), and the tepals are pale. Material with the ± typical shape of the lamina and that with broad laminas are found in the same area and both types of lamina are found in material with pedunculate figs. It is not (yet) possible to disentangle the variation in the eastern part of the range of distribution by distinguishing infraspecific taxa (varieties) and neither to distinguish a western and eastern subspecies.

In the eastern part of the range of distribution the upper ostiolar bracts are mostly fully imbricate, leaving no space in between them.

2. The varieties *hillii*, *rigo*, and *saffordii*, recognized by Corner (Gard. Bull. Singapore 17 (1960) 398, 399; 19 (1962) 385), are excluded from the species, as they are almost certainly taxa distinct at the species level; *F. rigo* occurs in the Malesian region.

3. The species resembles *F. pallescens* from which it differs in the presence of hairs on the fig wall inside, the usually obtuse acumen of the lamina, and the tertiary venation that runs more clearly parallel to the lateral veins. It also resembles Form C of *F. sumatrana* which can be distinguished by the fully closed ostiole and the absence of internal hairs.

45. Ficus microsyce Ridl.

Ficus microsyce Ridl., Fl. Malay Penins. 3 (1924) 335, non Ridl. 1926; Corner, Gard. Bull. Singapore 21 (1965) 21; Kochummen, Tree Fl. Malaya 3 (1978) 151.

Small tree or shrub, hemi-epiphytic or climbing. *Branches* drying brown. *Leafy twigs* 1–2.5 mm thick, ± angular, (very) minutely white puberulous or glabrous; periderm flaking off or persistent. *Leaves* spirally arranged; lamina oblong to elliptic to subobovate to oblanceolate, 3–11 by 1–5 cm, coriaceous, apex acuminate to obtuse (to rounded), base obtuse to rounded, margin ± revolute; both surfaces glabrous; midrib (at least the lower part) ± impressed above, lateral veins 4–8(–10) pairs, rather obscure, the basal pair ± (to hardly) distinct, up to 1/10–1/6 the length of the lamina, unbranched, tertiary largely parallel to the lateral veins to reticulate; waxy gland at the base of the midrib; petiole 0.5–1(–1.3) cm long, 1–1.5 mm thick, glabrous, drying blackish; stipules 0.5–1 cm long, (very) minutely white puberulous or glabrous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 2–3 mm long, (sub)equal, glabrous, persistent; receptacle subglobose, 0.3–0.4 cm diam. when dry, glabrous, at maturity yellowish (?), apex convex, ostiole c. 1.5 mm diam., slightly prominent, open, the upper ostiolar bracts not imbricate, on a rim with 2 or 3 lower ostiolar bracts almost as large as the 3 uppermost ones and filling the open space in between the primary ones; wall smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red. — **Fig. 125; Map 15.**

Distribution — *Malesia*: Sumatra, Malay Peninsula.

Habitat — Forest, at low altitudes.

Note — The structure of the ostiole with seemingly more than three ostiolar bracts around the opening is unusual.

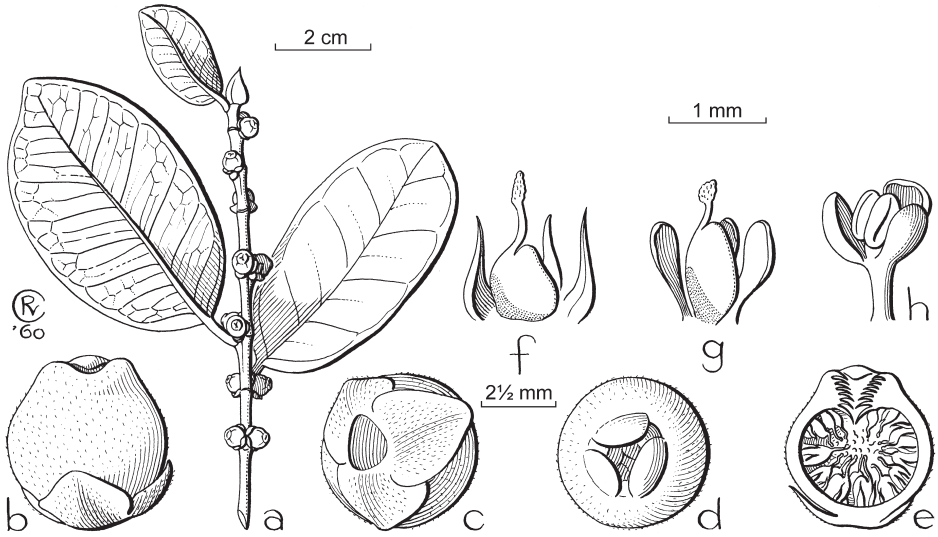


Fig. 125. *Ficus microsyce* Ridl. a. Leafy twig with figs; b. fig; c. basal bracts; d, e. ostiole; f. long-styled flower; g. short-styled flower; h. staminate flower (all: *SF 28544*).

46. Ficus miqueliana C.C. Berg

Ficus miqueliana C.C. Berg, Blumea 49 (2004) 468.

Tree up to c. 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying greyish to brown. *Leafy twigs* 2–4 mm thick, ± angular, glabrous (or sparsely and minutely whitish puberulous on the scars of the stipules); periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic (to (sub)obovate), (3–)8–16 by (2–)3.5–7.5 cm, coriaceous, apex short-acuminate, the acumen obtuse, base obtuse to rounded and auriculate to cordulate (to subcordate); both surfaces glabrous; cystoliths on both sides; midrib almost flat but slightly impressed towards the base above, lateral veins 5–8 pairs, the basal pair distinct, up to 1/4–1/3(–1/2) the length of the lamina, (sparsely and faintly) branched or unbranched, departing from the midrib well above the base of the lamina, 1–3 pairs of smaller basal lateral veins below the main pair, tertiary venation reticulate; waxy gland at the base of the midrib; petiole 1–2 cm long, c. 2 mm thick, glabrous, drying blackish or brown; stipules (0.5–)1–1.5 cm long, glabrous (or partly sparsely and minutely white appressed-puberulous), caducous, often with a distinct median part. *Figs* axillary or just below the leaves, paired (or solitary), sessile; basal bracts 3, 6–7 mm long, ± unequal, 1 (or 2) with a distinct median part, glabrous (or sparsely whitish puberulous), persistent; receptacle depressed-globose, 0.8–1 cm diam. when dry, (sub)glabrous, orange-brown at maturity, apex slightly convex, ostiole c. 3 mm diam., flat to slightly prominent, closed, the 3 upper ostiolar bracts fully imbricate, 2 visible and the third just; wall ± shrivelled to almost smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

Distribution — *Malesia*: Java (eastern).

Habitat — Forest, at low altitudes.

Notes — 1. Material included in this species was treated as *F. subgelderi* var. *rigida* by Corner (1960: 387). *Ficus miqueliana* differs from *F. subgelderi* (as currently defined) by the absence of hairs on the surfaces of the lamina, on the petiole, and mostly also on the leafy twig, the petiole, and the basal bracts of the fig. The fig receptacle is smaller and different in shape and the ostiole is closed instead of open. The basal lateral veins depart from the midrib well above the base of the lamina, a feature also found in *F. crassiramea* and *F. sundaica*.

2. This species is endemic to a small area in eastern Java.

47. Ficus pallescens (Weiblen) C.C. Berg

Ficus pallescens (Weiblen) C.C. Berg, Blumea 49 (2004) 470. — *Ficus binnendijkii* (Miq.) Miq. var. *pallescens* Weiblen, Trop. Biodiversity 5 (1998) 266.

Ficus binnendijkii (Miq.) Miq. var. *coriacea* Corner, Gard. Bull. Singapore 17 (1960) 395; 21 (1965) 20.

Tree up to c. 20 m tall, hemi-epiphytic or a climber (?). *Branches* drying brown to greyish. *Leafy twigs* 1–2(–2.5) mm thick, ± angular, glabrous (or minutely white puberulous); periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic or to subovate (or to lanceolate), 3–9 by 1–3.5 cm, coriaceous to subcoriaceous, apex acuminate to subcaudate (or to obtuse), base cuneate to rounded, margin flat; both

surfaces glabrous; midrib (at least the lower part) ± impressed above, lateral veins 4–6 pairs, the basal pair distinct, up to (1/4–)1/3–1/2 the length of the lamina, unbranched, without smaller lateral veins below the (main) pair, tertiary partly parallel to the lateral veins to reticulate, slightly prominent beneath; waxy gland at the base of the midrib; petiole 0.5–1(–1.3) cm long, 1–1.5(–2) mm thick, glabrous, drying blackish; stipules 0.5–1 cm long, glabrous (or minutely white puberulous), caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 1.5–3 mm long, (sub)equal, glabrous, persistent; receptacle subglobose, 0.3–0.6(–0.8) cm diam. when dry, glabrous, white to pink to purplish at maturity, ostiole 1–1.5 mm diam., (almost) flat, open, the 3 upper ostiolar bracts not or partly imbricate; wall ± shrivelled to smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

Distribution — *Malesia*: Sumatra (Banka), Malay Peninsula, Borneo.

Habitat — Forest, at low altitudes.

Notes — 1. This species shows similarities to *F. binnendijkii* (in which it was included). It differs, e.g., in the smaller leaves with less lateral veins and longer basal lateral veins and the shorter petioles and stipules.

2. It also resembles *F. microcarpa* from which it differs in the absence of internal hairs on the fig wall, the mostly acuminate lamina (usually with acute acumen) and the tertiary venation running less clearly parallel to the lateral veins (thus more distinctly reticulate), and the midrib usually clearly impressed above. Moreover, it resembles Form C of *F. sumatrana* from which it can be distinguished by the open ostiole and the (somewhat) shorter basal bracts.

3. Two forms can be distinguished: a typical and a small-leaved form. The lamina of the material from the Malay Peninsula tends to be thicker than that from Borneo and Sumatra. Moreover, the fig receptacle is often relatively large (0.6–0.8 cm diam.) and the leafy twigs stouter (2–2.5) mm thick in the Malay Peninsula.

4. *Urostigma tjiela* Miq. (from the Philippines), regarded as synonym of var. *coriacea* (Corner 1960), is after lectotypification transferred to *F. pisocarpa*.

48. Ficus paracamptophylla Corner

Ficus paracamptophylla Corner, Gard. Bull. Singapore 17 (1960) 387; 21 (1965) 17; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 237.

Climber or hemi-epiphytic tree. *Branches* drying greyish to brown. *Leafy twigs* 5–10 mm thick, ± angular, minutely white puberulous to subglabrous; periderm persistent. *Leaves* spirally arranged (reflexed or pendulous?); lamina oblong to lanceolate, 10–26 by 3.5–9.5 cm, coriaceous, apex (sub)acuminate, base cordate to rounded (to obtuse); upper surface glabrous, lower surface glabrous or minutely white puberulous on the midrib; cystoliths on both sides; midrib (at least its lower part) impressed above, lateral veins 7–12 pairs, the basal pair distinct, up to 1/4–1/3(–1/2) the length of the lamina, (sparsely and faintly) branched or unbranched, 0 or 1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate, slightly prominent to almost flat beneath; waxy gland at the base of the midrib; petiole 1.5–3 cm long, 2.5–3.5 mm thick, glabrous or minutely white puberulous, drying blackish or brown; stipules 2–3.5(–8) cm long, densely white puberulous, caducous or (on opening shoots) subpersistent. *Figs*

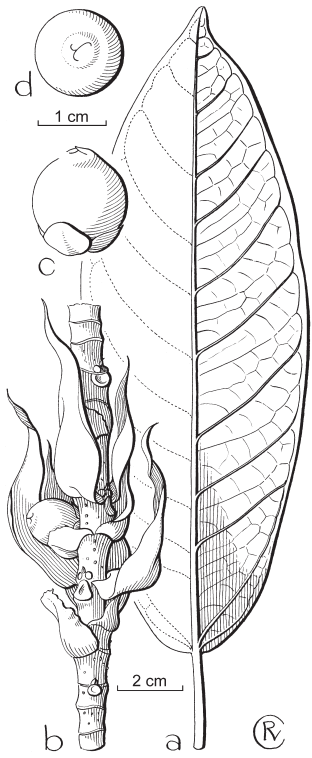


Fig. 126. *Ficus paracamptophylla* Corner. a. Leaf; b. twig with stipules and fig; c. fig and basal bract; d. ostiole (all: *Anderson 12530*).

axillary or just below the leaves, paired (or solitary), sessile; basal bracts 3, 4–8 mm long, ± unequal, 1 (or 2) keeled, whitish appressed-puberulous to glabrous, persistent; receptacle subglobose (often ± depressed), 1.3–1.8 cm diam. when dry, 2–2.5 cm diam. when fresh, (sub)glabrous, yellow to reddish at maturity, apex slightly convex and submammillate, ostiole 3–4 mm diam., slightly prominent, closed, the 3 upper ostiolar bracts fully imbricate, 2 visible and the third sometimes just; wall ± shrivelled to almost smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* red. — **Fig. 108r–u, 126.**

Distribution — *Malesia*: Borneo (northern: Sarawak and eastern: Kutai).

Habitat — Forest, at low altitudes.

49. **Ficus patellata** Corner

Ficus patellata Corner, Gard. Bull. Singapore 17 (1960) 400; 21 (1965) 24.
Ficus benjaminoides Corner, Gard. Bull. Singapore 17 (1960) 400; 21 (1965) 24.

Tree up to 15 m, hemi-epiphytic (?) or terrestrial (?). *Branches* drying brown to blackish. *Leafy twigs* 2–3 mm thick, ± angular to subterete, glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic, 4–10(–13) by 1.5–5(–5.5) cm, coriaceous, apex acuminate, base rounded to obtuse, margin flat; both surfaces glabrous; midrib (almost) flat, lateral veins 7–13 pairs, the basal pair ± to hardly distinct, up 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 0.7–1.5(–2.5) cm long, 1–2 mm thick, glabrous, drying blackish; stipules 1.5–2.5 cm long, sparsely and minutely white puberulous, drying blackish, caducous, often involute when dry. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 2–3 mm long, subequal, free, basally or entirely fused (forming a collar), glabrous, persistent; receptacle subglobose, 0.5–0.7 cm diam. when dry, glabrous, red at maturity, apex convex, ostiole c. 2 mm diam., prominent, closed, the 3 upper ostiolar bracts fully imbricate; wall smooth when dry; internal hairs absent or present (few). *Tepals* reddish. *Ovary* partly red. — **Fig. 110h–u, 118g–j.**

Distribution — New Guinea (and Celebes?).

Habitat — Forest, at low altitudes.

Notes — 1. The basal bracts are free, basally connate or entirely fused (as in the type of *F. patellata*).

2. A sterile collection from Celebes (Malili), *Boschproefstation No. Cel/IV-15*, might belong to this species.

50. Ficus pellucidopunctata Griff.

Ficus pellucidopunctata Griff., Notul. 4 (1854) 394; Ic. Pl. Asiat. 4 (1854) t. 554; Corner, Gard. Bull. Singapore 17 (1960) 394; 21 (1965) 20; Kochummen, Tree Fl. Malaya 3 (1978) 153; Tree Fl. Sabah & Sarawak 3 (2000) 230.

Ficus gelderi Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 216, 287. — *Ficus indica* L. var. *gelderi* (Miq.) King, Sp. Ficus 1 (1887) 39, t. 45; Elmer, Leafl. Philipp. Bot. 1 (1907) 243; 4 (1912) 1379; Merr., Enum. Born. (1921) 223; Enum. Philipp. Flow. Pl. 2 (1923) 54; Ridl., Fl. Malay Penins. 3 (1924) 334; Gagnep., Fl. Indo-Chine 5 (1928) 778; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 199.

Ficus everettii Elmer, Leafl. Philipp. Bot. 2 (1908) 538; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 202.

Tree up to c. 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 2–3.5 mm thick, ± angular, (minutely) white puberulous or glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic (or to lanceolate), 5–15(–19) by 1.5–7 cm, coriaceous, apex acuminate to subacute, base cuneate to rounded, margin flat; upper surface glabrous, lower surface (minutely) white puberulous on the midrib; midrib (at least the lower part) ± impressed above, lateral veins (6–)7–12 pairs, the basal pair ± to hardly distinct, up to 1/10–1/4 the length of the lamina, unbranched, 0 or 1 pairs of smaller lateral veins below the main pair, tertiary largely parallel to the lateral veins, slightly prominent to almost flat beneath; waxy gland at the base of the midrib; petiole 1–2(–2.2) cm long, 1.5–2 mm thick, (minutely) white puberulous or glabrous, drying blackish; stipules 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, white puberulous or glabrous, persistent; receptacle ellipsoid, 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. — **Map 15.**

Distribution — Thailand; in *Malesia*: Sumatra, Malay Peninsula, Borneo, Philippines (Palawan).

Habitat — Forest, at altitudes up to 1500 m.

Note — This species resembles the typical form of *F. sundaica*, from which it can be distinguished by the widely open ostiole.

51. Ficus pisocarpa Blume

Ficus pisocarpa Blume, Bijdr. (1825) 454; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286 (sub *F. glabella* Blume); Corner, Gard. Bull. Singapore 17 (1960) 394; 21 (1965) 20; Backer & Bakh.f., Fl. Java 2 (1965) 35; Kochummen, Tree Fl. Malaya 3 (1978) 153; Tree Fl. Sabah & Sarawak 3 (2000) 222. — *Urostigma pisocarpum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 344.

Urostigma tjiela Miq., London J. Bot. 6 (1847) 580, non *F. tsiela* Roxb. 1832; Fl. Ind. Bat. 1, 2 (1859) 344; Fl. Ind. Bat., Suppl. (1861) 439; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 263, 287; King, Sp. Ficus 1 (1887) 39; Corner, Gard. Bull. Singapore 17 (1960) 395; 21 (1965) 20. — Syntypes: *Griffith 31* (not traced), Myanmar, and *Cuming 1931* (L), Philippines, without locality; the latter specimen, representing *Ficus pisocarpa* Blume, is designated as lectotype here.

Urostigma cycloneuron Miq., Fl. Ind. Bat., Suppl. (1861) 438; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 264, 287 (sub *F. pseudorubra* Miq.). — *Ficus cycloneura* (Miq.) King, Sp. Ficus 1 (1887) 31, t. 32.

Ficus microstoma Wall. ex King, Sp. Ficus 1 (1887) 38, t. 44; Fl. Brit. India 5 (1888) 506; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 100; Koord., Atlas Baumart. Java 4 (1916) t. 725; Ridl., Fl. Malay Penins. 3 (1924) 334.

Ficus episima Corner, Gard. Bull. Singapore 17 (1960) 394; 21 (1965) 20.

Tree up to 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to yellowish. *Leafy twigs* 2–5 mm thick, ± angular, glabrous (or white puberulous); periderm persistent. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)-ovate or to (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 to rounded), margin usually ± 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 white puberulous on the midrib or also the lateral veins); lateral veins and midrib (at least the lower part) ± impressed above, lateral veins (3–)4–6 pairs, the basal pair distinct, up to 1/3–1/2 the length of the lamina, branched, 0 or 1 pairs of smaller lateral veins below the main pair, tertiary veins reticulate or towards the midrib partly parallel to the lateral veins, 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 white puberulous), drying blackish to brown; stipules 0.5–1(–2) cm long, glabrous (or white puberulous), caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 3–5 mm long, (sub)equal, glabrous (or 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 subpustullate, 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 inter-locked, 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. — **Map 15.**

Distribution — Thailand; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines (Mindanao).

Habitat — Forest, at altitudes up to 1200(–1700) m.

Notes — 1. The species resembles *F. sumatrana*, from which it differs in the branched basal lateral veins, the largely reticulate tertiary venation, the often rounded apex of the lamina, and the short ostiolar bracts.

2. Most collections are entirely glabrous, but some from Borneo are hairy on various parts.

3. As essential differentiating characters are lacking, *F. episima* is included in this species. The material under *F. episima* differs in the ellipsoid receptacle and the tertiary venation largely parallel to the lateral veins.

4. The species is characterized by a widely open ostiole, but the upper bracts are occasionally fully imbricate and the ostiole closed.

52. Ficus pubilimba Merr.

Ficus pubilimba Merr., J. Arnold Arbor. 23 (1942) 159; Corner, Wayside Trees (1940) 680 ('Province Wellesley Fig'); Gard. Bull. Singapore 21 (1965) 34; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 138; Kochummen, Tree Fl. Malaya 3 (1978) 153.

Ficus pubilimba Merr. var. *ovata* Corner, Gard. Bull. Singapore 17 (1960) 384.

Tree up to 15 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 2–4 mm thick, ± angular, densely whitish puberulous, glabrescent; periderm persistent (or flaking off). *Leaves* spirally arranged; lamina oblong to elliptic, 4–12(–23) by 1.5–5(–10) cm, coriaceous, apex short-acuminate, base rounded to obtuse; upper surface whitish puberulous on the midrib or also on the lateral veins, lower surface ± densely whitish puberulous; cystoliths absent or few above; midrib (almost) flat above, lateral veins (4–)6–8 pairs, the basal pair distinct, up to (1/6–)1/4–1/3 the length of the lamina, faintly branched or unbranched, 0 or 1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate, ± prominent; waxy gland at the base of the midrib; petiole 1–1.5 cm long, 1.5–2 mm thick, ± densely whitish puberulous, drying brown; stipules 0.5–1.2 cm long, whitish subsericeous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 0.5–1.5 mm long, ± unequal in shape, sparsely and minutely puberulous, persistent; receptacle subglobose, 0.5–0.7 cm diam. when dry, sparsely and minutely puberulous, red to purplish at maturity, apex convex to submammillate, ostiole 1.5–2 mm diam., slightly prominent, open, the 3 upper ostiolar bracts not or partly imbricate, leaving space showing bracts underneath; wall smooth or ribbed towards the ostiole when dry; internal hairs absent or present (sparse). *Tepals* whitish. *Ovary* partly red.

Distribution — Sri Lanka, Myanmar, S China (Hainan), Indochina, Thailand; in *Malesia*: Malay Peninsula.

Habitat — Forest, at low altitudes.

53. Ficus retusa L.

Ficus retusa L., Mant. 1 (1767) 129; Willd., Sp. Pl. 4 (1806) 1147; Sm. in Rees, Cycl. 14 (1810) n. 62; Corner, Gard. Bull. Singapore 17 (1960) 393; 21 (1965) 20; Backer & Bakh.f., Fl. Java 2 (1965) 35. — *Perula retusa* (L.) Raf., Sylv. Tellur. (1838) 59. — *Urostigma retusum* (L.) Gasp., Nov. Gen. Fic. (1844) 7; Miq., London J. Bot. 6 (1847) 581; Fl. Ind. Bat. 1, 2 (1859) 345.

Urostigma truncatum Miq. in Zoll., Syst. Verz. 2 (1854) 91, 97; Fl. Ind. Bat. 1, 2 (1859) 336. — *Ficus truncata* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 262, 286, non Vahl 1790; King, Sp. Ficus 1 (1887) 41, t. 48; Fl. Brit. India 5 (1888) 507; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 110; Renner, Bot. Jahrb. Syst. 39 (1907) 381; Koord., Atlas Baumart. Java 4 (1916) t. 731; Merr., Enum. Born. (1921) 228; Ridl., Fl. Malay Penins. 3 (1924) 335; Vreede, Ann. Bot. Gard. Buitenzorg 51 (1949) 146.

Tree up to 10 m tall, hemi-epiphytic. *Branches* drying brown to yellowish. *Leafy twigs* 3–5 mm thick, ± angular, minutely white puberulous and with dark brown appressed hairs; periderm flaking off or persistent. *Leaves* spirally arranged; lamina subobovate to obovate to oblong, 4–15(–18) by 1.5–6(–7.5) cm, coriaceous, apex rounded, base obtuse to rounded, margin flat or slightly revolute towards the base; upper surface with minute dark brown appressed hairs or glabrous (glabrescent?), lower surface minutely white puberulous or glabrous on the midrib 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–)4–6 pairs, the basal pair distinct, up to 1/3–1/2(–2/3) the length of the lamina, unbranched or faintly branched, 0 or 1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate, slightly prominent beneath; waxy gland at the base of the midrib; petiole 0.5–1 cm long, c. 2 mm thick, minutely white puberulous or glabrous, drying brown; stipules 1–2(–2.5) cm long, minutely white puberulous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 3–5 mm long, (sub)equal, glabrous or white puberulous, persistent; receptacle subglobose, 0.6–0.9 cm diam. when dry, with dark brown appressed hairs or glabrous (glabrescent?), orange to dark red at maturity, apex slightly convex to flat, ostiole c. 2 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. *Ovary* (dark) red.

Distribution — *Malesia*: Java and Borneo (southern).

Habitat — Forest, at low altitudes.

Note — Variety *borneensis* Corner (Gard. Bull. Singapore 17 (1960) 393) is currently treated as a distinct species, *F. kochummeniana*.

54. Ficus rigo F.M. Bailey

Ficus rigo F.M. Bailey, Queensl. Agr. J. 1 (1897) 235; Summerh., J. Arnold Arbor. 10 (1929) 146. — *Ficus retusa* L. var. *rigo* (F.M. Bailey) Diels, Bot. Jahrb. Syst. 67 (1935) 183. — *Ficus microcarpa* L.f. var. *rigo* (F.M. Bailey) Corner, Gard. Bull. Singapore 19 (1962) 385; 21 (1965) 23.

Tree up to c. 15 m tall, (secondarily?) terrestrial, without copious aerial roots on the branches. *Branches* drying brown. *Leafy twigs* 2–3 mm thick, ± angular, glabrous; periderm mostly flaking off. *Leaves* spirally arranged; lamina oblong to elliptic to (sub)obovate, 6–10 by 2.5–5.5 cm, coriaceous, apex rounded to obtuse, base cuneate to subattenuate, margin flat or ± revolute towards the base, mostly ± callose towards the base; both surfaces glabrous; midrib flat above, lateral veins 5–8 pairs, the basal pair distinct, up to 1/4–1/3 the length of the lamina, unbranched, ± curved, tertiary largely parallel to the lateral veins, basal and other lateral veins as well as the tertiary venation not running in the same direction, the basal lateral veins departing from the midrib in clearly narrower angles than the other venation; waxy gland at the base of the midrib; petiole 1–1.5 cm long, 1–2 mm thick, glabrous, drying brown; stipules 1–1.5 cm long, glabrous, caducous. *Figs* axillary or just below the leaves, paired (or solitary), sessile; basal bracts 3, 2–3 mm long, (sub)equal, glabrous, persistent; receptacle subglobose, 0.6–0.8 cm diam. when dry, glabrous, yellow to orange with red spots at maturity, apex slightly convex to flat, ostiole 1.5–2 mm diam., (almost) flat, with 3 (just) fully imbricate upper ostiolar bracts, no rim; wall smooth; internal hairs absent. *Tepals* entirely whitish to pinkish. *Ovary* whitish.

Distribution — *Malesia*: New Guinea (eastern)

Habitat — Monsoon scrub or forest bordering savannah, at low altitudes.

Note — This taxon was included in *F. microcarpa* as a variety, as it matches more or less features of eastern forms of that species. However, it seems to be wiser to maintain it as a distinct species, although on the basis of a combination of rather weak differenti-

ating characters: the midrib flat above, the stipules 1–1.5 cm long, the ripe figs yellow to orange at maturity, and the absence of internal hairs.

55. Ficus soepadmoi Kochummen

Ficus soepadmoi Kochummen, Gard. Bull. Singapore 50 (1998) 212; Tree Fl. Sabah & Sarawak 3 (2000) 237.

Tree, hemi-epiphytic or a climber (?). *Branches* drying dark brown. *Leafy twigs* 2–3 mm thick, ± angular, brownish puberulous; periderm persistent. *Leaves* spirally arranged; lamina oblong to lanceolate, (5–)8–13 by (1–)3–4 cm, coriaceous, apex acuminate, base cuneate to rounded, margin slightly revolute to flat; upper surface glabrous, lower surface (very) minutely whitish puberulous on the midrib; midrib impressed above, lateral veins 7–9 pairs, the basal pair distinct, up to 1/6–1/3 the length of the lamina, unbranched, running parallel to the margin, tertiary venation reticulate to partly parallel to the lateral veins, areoles clearly visible, brownish; waxy gland at the base of the midrib; petiole 1–1.5 cm long, c. 2 mm thick, brownish (to whitish) puberulous, drying blackish; stipules 1–1.5 cm long, brownish puberulous, caducous. *Figs* axillary or also just below the leaves, paired (or solitary), sessile; basal bracts 3, c. 2 mm long, ± unequal, glabrous, persistent; receptacle subglobose, 0.5–0.8 cm diam. when dry, sparsely and minutely brownish to whitish puberulous, at maturity yellowish (?), apex convex to flat, ostiole c. 2.5 mm diam., (almost) flat, closed, the 3 upper ostiolar bracts fully imbricate; wall ribbed when dry; internal hairs absent. *Tepals* red. *Ovary* partly red.

Distribution — *Malesia*: Borneo (northern: Sabah and Sarawak).

Habitat — Forest, at altitudes low altitudes.

Note — This species is clearly related to *F. lowii*, from which it differs in the smaller leaves and figs and the brown-coloured areoles of the lamina beneath.

56. Ficus spathulifolia Corner

Ficus spathulifolia Corner, Gard. Bull. Singapore 17 (1960) 391; 21 (1965) 19; Kochummen, Tree Fl. Malaya 3 (1978) 156; Tree Fl. Sabah & Sarawak 3 (2000) 305.
Ficus spathulifolia Corner var. *substipitata* Corner, Gard. Bull. Singapore 17 (1960) 392.

Tree up to 25 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 2–4 mm thick, ± angular, glabrous; periderm persistent. *Leaves* spirally arranged; lamina obovate to subobovate, 3–9 by 1–4.5 cm, coriaceous, apex rounded to obtuse, base obtuse to cuneate (or to rounded), margin flat or ± revolute towards the base; both surfaces glabrous; midrib (at least the lower part) ± impressed above, lateral veins (3–)4–6(–8) pairs, the basal pair distinct, up to 1/3–1/2 the length of the lamina, unbranched, tertiary largely parallel to the lateral veins, the smaller veins ± obscure; waxy gland at the base of the midrib; petiole 0.5–1.5 cm long, 1.5–2 mm thick, glabrous, drying brown, the epidermis persistent; stipules 0.5–1(–1.2) cm long, glabrous (or white puberulous), caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 2–4 mm long, (sub)equal, glabrous, persistent; receptacle subglobose, 0.4–0.5 cm diam. when dry, sometimes substipitate, glabrous, yellow to red at maturity,

apex convex to mammillate, ostiole c. 2 mm diam., ± umbonate, closed, the 3 upper ostiolar bracts fully imbricate; wall (almost) smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* reddish.

Distribution — *Malesia*: Sumatra (western), Malay Peninsula, Borneo.

Habitat — Forest, mostly swamp forest, at altitudes up to c. 1000 m.

Notes — 1. The species is distinctive by the mostly invisible tertiary and smaller venation at the lower surface of the lamina.

2. Whether the species occurs in Vietnam with var. *annamensis* Corner (Gard. Bull. Singapore 17 (1960) 392) is not certain. The material on which this taxon is based might represent a distinct endemic species.

57. **Ficus stricta** (Miq.) Miq.

Ficus stricta (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 266, 288; King, Sp. Ficus 1 (1887) 44, t. 53; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 122; Koord., Atlas Baumart. Java 4 (1916) t. 736; Gagnep., Fl. Indo-Chine 5 (1928) 758; Backer & Bakh.f., Fl. Java 2 (1965) 24; Corner, Gard. Bull. Singapore 21 (1965) 21; Kochummen, Tree Fl. Malaya 3 (1978) 157; Tree Fl. Sabah & Sarawak 3 (2000) 226. — *Urostigma strictum* Miq., Pl. Jungh. (1851) 50; in Zoll., Syst. Verz. 2 (1854) 91; Fl. Ind. Bat. 1, 2 (1859) 344.

Tree up to 40 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 to oblong to (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, up 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, c. 2 mm thick, glabrous, drying pale brown; stipules (0.7–)2–3 cm long, glabrous, drying often pale brown (to blackish), caducous, often involute when dry. *Figs* axillary, paired (or solitary), sessile, initially enclosed in up to 0.7 cm long calyptrate bud covers; basal bracts 3, 3–8(–10) mm long, unequal in size and shape, glabrous, persistent; receptacle subglobose, (0.8–)1–1.8 cm diam. when dry, 1.5–3 cm diam. when fresh, 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.

Distribution — Burma (Andaman Islands), S China, Indochina; in *Malesia*: Sumatra (Atjeh), Malay Peninsula, Java, Philippines (Luzon, probably only in cultivation).

Habitat — Forest, at altitudes up to 2000 m.

Note — This species is very close to *F. benjamina* from which it differs in the large basal bracts, unequal in shape and size, and in the distinctly longer stipules. The species occurs scattered in the western part of the range of *F. benjamina* and is rather poorly represented in herbarium collections.

58. *Ficus subcordata* Blume

Ficus subcordata Blume, Bijdr. (1825) 440; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287; King, Sp. Ficus 1 (1887) 184; Corner, Gard. Bull. Singapore 17 (1960) 395; 21 (1965) 21; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 242. — *Urostigma subcordatum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 349.

Urostigma balicum Miq., Fl. Ind. Bat. 1, 2 (1859) 348; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287 (sub n. 95), non *F. balica* Miq., Fl. Ind. Bat. 1, 2 (1859) 314. — *Ficus balica* (Miq.) Boerl., Handl. 3 (1900) 369, non Miq. 1859.

Ficus garciniifolia Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 218, 287, '*garciniaefolia*'; King, Sp. Ficus 1 (1887) 43, t. 51B; Summerh., J. Arnold Arbor. 22 (1941) 86.

Ficus calophylloides Elmer, Leafl. Philipp. Bot. 4 (1911) 1246; F.X. Williams, Hawaiian Plant. Rec. 25 (1921) 213, f. 12, 13; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 47; Gagnep., Fl. Indo-Chine 5 (1928) 765; Elmer, Leafl. Philipp. Bot. 9 (1937) 3457; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 201.

Ficus acrorrhyncha Summerh., J. Arnold Arbor. 13 (1932) 98.

Ficus fairchildii Backer, Blumea 6 (1948) 306.

Ficus subcordata Blume var. *malayana* Corner, Gard. Bull. Singapore 17 (1960) 396; Kochummen, Tree Fl. Sabah & Sarawak 3 (2000) 242.

Ficus polygramma Corner, Gard. Bull. Singapore 17 (1960) 399; 21 (1965) 24.

Tree up to c. 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish (to blackish) or to 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

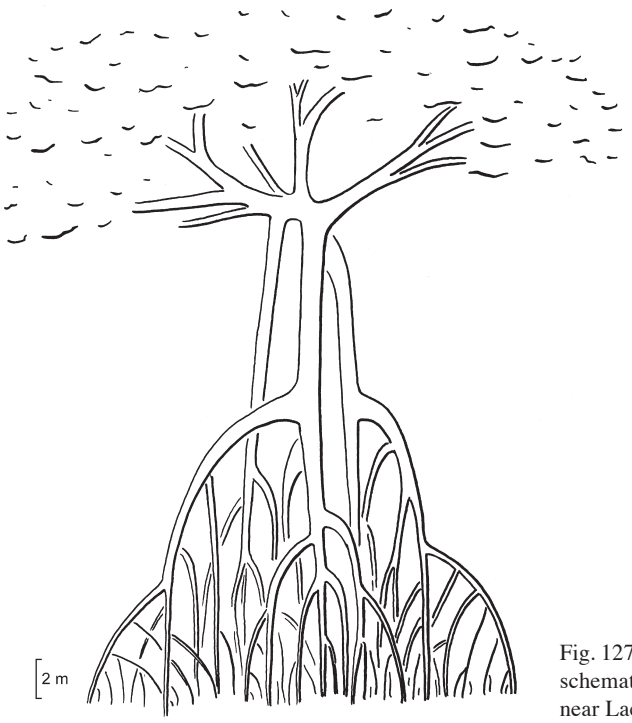


Fig. 127. *Ficus subcordata* Blume. Habit, schematic, Papua New Guinea, Oomsis, near Lae.

(short-)acuminate to rounded, base rounded to obtuse (to cuneate or to subcordate), margin flat or slightly revolute towards the base, often callose (towards the base); both surfaces glabrous; midrib (almost) flat, lateral veins 8–16(–20) pairs, basal pair ± to hardly distinct, up 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 to ovoid or to cylindrical, 1.2–2.5 cm diam. and up to 4 cm long when dry, glabrous, at maturity yellow to red to black, apex convex, ostiole c. 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. — **Fig. 124h–l, 127.**

Distribution — Thailand, Indochina, Solomon Islands, New Hebrides; in: *Malesia*: Sumatra, Malay Peninsula, Java, Lesser Sunda Islands (Bali, Flores, Sumbawa, Timor), Borneo, Philippines, Celebes, New Guinea (incl. New Britain).

Habitat — Forest, at altitudes up to 1000 m.

Notes — 1. This species shows close affinities to *F. benjamina* as in the colours in which the stipules and petioles usually dry, the exfoliating periderm, and the often ± callose margin towards the base of the lamina.

2. In material from the Malay Peninsula described as var. *malayana*, the basal bracts form a low (to 1 mm wide) annular rim.

59. Ficus subgelderi Corner

Ficus subgelderi Corner, Gard. Bull. Singapore 17 (1960) 386; 21 (1965) 17; Kochummen, Tree Fl. Malaya 3 (1978) 157; Tree Fl. Sabah & Sarawak 3 (2000) 222.
Ficus indica auct. non L.: Corner, Wayside Trees (1940) t. 208.

Tree up to c. 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying greyish to brown. *Leafy twigs* 2–4 mm thick, ± angular, whitish puberulous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic (to subobovate), 4–16 by 2–7 cm, coriaceous, apex acuminate, base cuneate to obtuse; upper surface minutely whitish puberulous on (the lower part of) the midrib, lower surface (minutely) whitish puberulous on the midrib or also on the lateral veins; cystoliths on both sides; midrib slightly impressed above, lateral veins 5 or 6 (or 7) pairs, the basal pair distinct, up to 1/4–1/3(–1/2) the length of the lamina, (sparsely and faintly) branched or unbranched, 0 or 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(–3) cm long, c. 2 mm thick, (sparsely) whitish puberulous, drying blackish or brown, sometimes with a waxy layer; stipules (0.5–)1–1.5 cm long, whitish to yellowish (sub)sericeous to puberulous, caducous, often with a distinct median part. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 6–7 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 to ovoid (to subglobose), 0.8–1.2 cm diam. when dry, (sub)glabrous, orange to red at maturity, apex slightly convex, ostiole c. 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).

Distribution — Indochina, Thailand; in *Malesia*: Sumatra, Malay Peninsula, Borneo.

Habitat — Forest, at low altitudes.

Note — The material included in var. *rigida* as defined by Corner (1960: 387) is heterogeneous; some specimens, including the type, belong to *F. crassiramea* subsp. *crassiramea*, some to *F. pellucidopunctata*, and the remainder to the new *F. miqueliana*.

60. Ficus sumatrana (Miq.) Miq.

Ficus sumatrana (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 263, 287, t. 10B; King, Sp. Ficus 1 (1887) 40, t. 35B; Corner, Gard. Bull. Singapore 21 (1965) 18; Backer & Bakh.f., Fl. Java 2 (1965) 35; Kochummen, Tree Fl. Malaya 3 (1978) 158; Tree Fl. Sabah & Sarawak 3 (2000) 223. — *Urostigma sumatranum* Miq., Pl. Jungh. (1851) 49; Fl. Ind. Bat. 1, 2 (1859) 341; Fl. Ind. Bat., Suppl. (1861) 437.

Urostigma pseudorubrum Miq, Fl. Ind. Bat. 1, 2 (1849) 343. — *Ficus pseudorubra* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 264, 287.

Urostigma zollingerianum Miq. in Zoll., Syst. Verz. 2 (1854) 91; Fl. Ind. Bat. 1, 2 (1859) 342. — *Ficus zollingeriana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 264, 287.

Urostigma monadenum Miq., Fl. Ind. Bat., Suppl. (1861) 437.

Ficus pseudoacamptophylla Valeton in Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 105; Koord., Atlas Baumart. Java 4 (1916) t. 727.

Ficus subsumatrana Gagnep., Notul. Syst. (Paris) 4 (1927) 96; Fl. Indo-Chine 5 (1928) 818. — *Ficus sumatrana* (Miq.) Miq. var. *subsumatrana* (Gagnep.) Corner, Gard. Bull. Singapore 17 (1960) 390.

Ficus sumatrana (Miq.) Miq. var. *circumscissa* Corner, Gard. Bull. Singapore 17 (1960) 390; Kochummen, Tree Fl. Malaya 3 (1978) 158.

Ficus sumatrana (Miq.) Miq. var. *microsyce* Corner, Gard. Bull. Singapore 17 (1960) 390; Kochummen, Tree Fl. Malaya 3 (1978) 158.

Ficus palaquiifolia Corner, Gard. Bull. Singapore 17 (1960) 399; 21 (1965) 24; Tree Fl. Sabah & Sarawak 3 (2000) 234.

Ficus dulitensis Kochummen, Gard. Bull. Singapore 50 (1998) 205.

Ficus indica auct. non L.: Elmer, Leafl. Philipp. Bot. 1 (1907) 49, 243; Merr., Enum. Philipp. Flow. Pl. 2 (1923) 54; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 199.

Tree up to 30 m tall, hemi-epiphytic, sometimes a climber. *Branches* drying brown to greyish. *Leafy twigs* 1.5–3 mm thick, ± angular, glabrous or (often very minutely) white (to brownish) puberulous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic or to lanceolate, (2–)4–10(–14) by (1–)1.5–5(–6) cm, coriaceous, apex acuminate, the acumen usually acute, base rounded to obtuse (to subattenuate), margin flat or slightly revolute towards the base, sometimes ± callose towards the base; both surfaces glabrous; midrib (at least the lower part) ± impressed above, lateral veins (3–)4–6(–7) or 6–10(–11) pairs, the basal pair distinct, up to 1/6–1/2 the length of the lamina, unbranched, curved to almost straight, tertiary largely parallel to the

lateral veins to almost reticulate, basal and other lateral veins as well as the tertiary venation not running in the same direction, slightly prominent to almost flat, the basal lateral veins usually departing from the midrib in clearly narrower angles than the other venation, at least the tertiary venation; waxy gland at the base of the midrib; petiole 0.5–1(–1.2) or (0.8–)1–2.5 cm long, 1–2.5 mm thick, glabrous or sparsely and (very) minutely white puberulous, drying blackish to brown; stipules 0.5–1(–1.3) or 1–1.5(–2) cm long, (very minutely) white (to brownish) puberulous or glabrous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 3–8(–10) mm long, (sub)equal, glabrous (or puberulous), (faintly) keeled, persistent; receptacle subglobose, 0.3–1 cm diam. when dry, glabrous, yellow to red at maturity, apex convex, ostiole 1–3 mm diam., slightly prominent (to flat), closed, the 3 upper ostiolar bracts fully imbricate; wall smooth to slightly shrivelled when dry; internal hairs absent. *Tepals* red. *Ovary* partly red. — **Fig. 128.**

Distribution — Myanmar, Indochina, Thailand; in *Malesia*: Sumatra (incl. Banka), Malay Peninsula, Java, Borneo, Philippines, Celebes (?).

Habitat — Forest, at altitudes up to c. 1600 m.

Notes — 1. This species is quite variable and three more or less distinct forms can be distinguished. They may have more weight than currently given, but neither morphology nor distribution provide tools to treat them otherwise.

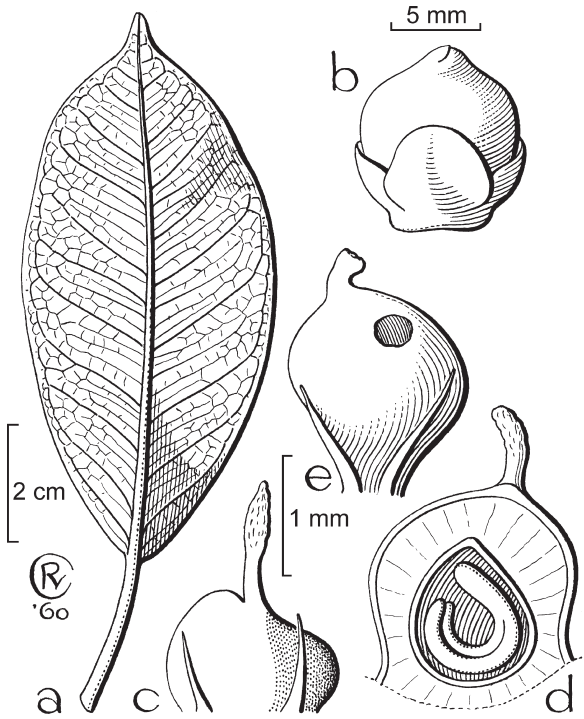


Fig. 128. *Ficus sumatrana* (Miq.) Miq., Form B. a. Leaf; b. fig; c. long-styled flower in fruit; d. fruit; e. short-styled flower with opened 'gall-fruit' (a, b: *SF 27413*; c–e: *SF 26703*).

Form A — Lateral veins 4–6(–7) pairs, the basal pair mostly up to 1/4–1/3 the length of the lamina; petiole mostly longer than 1 cm (even in relatively small leaves); stipules mostly longer than 1 cm and (minutely) hairy. Fig receptacle 0.6–1 cm diam. when dry; basal bracts 3–4(–7) mm long. — Sumatra, Malay Peninsula, Java, Borneo, Philippines, and the Asian mainland, at low altitudes. This form includes var. *circumscissa* and var. *subsumatrana*.

Form B — Leafy twigs relatively thick (often drying dark brown to blackish). Lamina relatively thick; lateral veins 6–9(–11) pairs, the basal pair mostly up to 1/8–1/4 the length of the lamina; petiole mostly longer than 1 cm; stipules mostly longer than 1 cm, glabrous. Fig receptacle 0.6–0.8 cm diam. when dry; basal bracts 5–8(–10) mm long. — Borneo (northern), mostly at altitudes between 800 and 1600 m (several collections made on Mt Kinabalu). This form has been described as *F. palaquiifolia*.

Form C — Lateral veins 3–6(–7), the basal pair often up to 1/2 the length of the lamina; petiole mostly up to 1 cm long (even in relatively large leaves), but in the Philippines often longer, up to 1.8 cm, rarely up to 2.5 cm; stipules mostly up to 1 cm long and usually glabrous. Fig receptacle 0.3–0.6(–0.8) cm diam. when dry; basal bracts 3–4 mm long. — Sumatra, Malay Peninsula, Borneo, Philippines, and possibly Java, at altitudes up to 1100 m. This form has been described as *F. dulitensis* and *F. sumatrana* var. *microsyce*. Some of the collections included are rather similar to *F. microcarpa*, but can be distinguished by the usually acute acumen of the lamina, the tertiary venation which is rather reticulate then running largely parallel to the lateral veins, and the smaller basal bracts 2–3 mm long.

2. In particular Form C may be confused with *F. microcarpa* and *F. pallescens*; the differences are discussed under these two species.

3. No material from Celebes is found in L and, therefore, the presence of the species in this island (as indicated by Corner) is uncertain.

61. **Ficus sundaica** Blume

Ficus sundaica Blume, Bijdr. (1825) 450; Corner, Gard. Bull. Singapore 17 (1960) 389; 21 (1965) 18; Backer & Bakh.f., Fl. Java 2 (1965) 35; Kochummen, Tree Fl. Malaya 3 (1978) 158; Tree Fl. Sabah & Sarawak 3 (2000) 225. — *Ficus indica* L. var. *sundaica* (Blume) Miq., Pl. Jungh. (1851) 50; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287. — *Urostigma sundaicum* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 339.

Ficus rubescens Blume, Bijdr. (1825) 453. — *Urostigma rubescens* (Blume) Miq., Fl. Ind. Bat. 1, 2 (1859) 338.

Ficus rubra Blume, Bijdr. (1825) 453, non Vahl 1805, nec Roth 1821.

?*Ficus mangiferifolia* Griff., Notul. 4 (1854) 395; Ic. Pl. Asiat. 4 (1854) t. 555 (I).

Urostigma pyrifolium Miq., Fl. Ind. Bat. 1, 2 (1859) 338.

Ficus korthalsii Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 215, 286; King, Sp. Ficus 1 (1887) 33, t. 35A; H.J.P. Winkl., Bot. Jahrb. Syst. 49 (1913) 361; Merr., Enum. Born. (1921) 224.

Ficus korthalsii Miq. var. *beccariana* King, Sp. Ficus 1 (1887) 33. — *Ficus sundaica* Blume var. *beccariana* (King) Corner, Gard. Bull. Singapore 17 (1960) 389; Kochummen, Tree Fl. Malaya 3 (1978) 158.

Ficus rigida (Miq.) Miq. var. *trichocalyx* Valeton in Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 100; Koord., Atlas Baumart. Java 4 (1916) t. 724. — *Ficus indica* L. var. *trichocalyx* (Valeton) Backer, Bekn. Fl. Java 6A (1948) 53. — *Ficus sundaica* Blume var. *trichocalyx* (Valeton) Backer in Backer & Bakh.f., Fl. Java 2 (1965) 35.

Ficus sundaica Blume var. *impressicostata* Kochummen, Gard. Bull. Singapore 50 (1998) 217.
Ficus indica auct. non L.: Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 263, 287; Kurz, Forest Fl. Burma 2 (1877) 442; King, Sp. Ficus 1 (1887) 39, t. 45; Fl. Brit. India 5 (1888) 506; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 106; Gibbs, J. Linn. Soc. Bot. 42 (1914) 137; Koord., Atlas Baumart. Java 4 (1916) t. 728, 729; Merr., Enum. Born. (1921) 224; Ridl., Fl. Malay Penins. 3 (1924) 334; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1011; Corner, Wayside Trees (1940) 678, f. 251 (haud t. 208 = *F. subgelderi* Corner). — *Ficus pyrifolia* (Miq.) Boerl., Handl. 3 (1900) 369, non Burm.f. 1768, nec. Lam. 1788, nec Salisb. 1796.

Tree up to 35 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown. *Leafy twigs* (2–)3–4 mm thick, ± angular, glabrous (or white puberulous); periderm persistent. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)ovate (to lanceolate), 4–20(–26) by 1.5–7(–9) cm, (thickly) coriaceous, apex acuminate, the acumen usually acute, base cuneate to rounded, margin flat to slightly revolute (towards the base); upper surface glabrous (or minutely white puberulous on (the lower part of) the midrib), lower surface glabrous (or minutely white puberulous on (the lower part of) the midrib); midrib slightly prominent to flat (or slightly impressed) above, lateral veins (4–)5–10 pairs, the basal pair distinct, up to 1/4–1/2 the length of the lamina, unbranched, departing from the midrib 0.2–0.5(–1) cm above the base of the lamina, 0 or 1 (or 2) pairs of smaller lateral veins below the main pair, tertiary venation largely parallel to the lateral veins, slightly prominent to flat and then ± obscure; waxy gland at the base of the midrib; petiole 1–3.5(–4.5) cm long, 2–3 mm thick, glabrous (or white puberulous), drying blackish; stipules 1–3(–5) cm long, glabrous (or white pu-

Fig. 129. *Ficus sundaica* Blume. Tree with the root-trunk next to the trunk of the host-tree, beginning to form a root-basket around the trunk of its host. Photo E.J.H. Corner.

berulous), caducous, often with a distinct median part. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 4–8(–11) mm long, (sub)equal, (broadly) ovate with an obtuse to rounded to subacute apex, often with a distinct median part or keeled, not or only basally imbricate, covering up to 1/3(–1/2) of the receptacle, glabrous (or white puberulous), persistent; receptacle subglobose to ovoid to ellipsoid or to obovoid, (0.8–)1–1.6(–2) cm diam. when dry, glabrous, yellow to red at maturity, apex convex to mammillate or to almost flat, ostiole 3–5(–6) mm diam., ± prominent to flat, closed, the 3 upper ostiolar bracts fully imbricate, only 2 visible or the third just; wall shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red. — **Fig. 129.**

Distribution — Myanmar, Indochina, Thailand; in *Malesia*: Sumatra, Malay Peninsula, Java, Borneo, Philippines (Palawan), Lesser Sunda Islands (Bali?), Moluccas?.

Habitat — Forest (islands) or scrubs, often on white sand or in swamps, at altitudes up to 1100 m.

Notes — 1. The species is rather variable as with regard to the shape and size of the receptacle, the length of the basal bracts, and also the shape and the length of lamina. Two forms can be distinguished:

Form A — Lamina relatively small, mostly less than 10 cm long, with 5 or 6 pairs of lateral veins and the midrib at least in the lower part of the lamina ± impressed above. The stipules and petioles are relatively short, 1–2 cm and 1–1.5 cm long, respectively. The fig receptacle is ovoid to ellipsoid and 1.5–2 cm diam. with a slightly convex to flat apex. — It is rather distinct among material from northern Borneo and was described as var. *impressicostata* by Kochummen.

Form B — Lamina relatively large, mostly 10–20 cm long, with 7–10 pairs of lateral veins, and mostly with the midrib flat to slightly prominent. The stipules and petioles are longer, 2–3.5 cm and 2–3 cm long, respectively. The figs are smaller, mostly less than 1.5 cm diam. and either subglobose or ellipsoid. The ostiole is mostly prominent. It is more common and widespread.

Intermediates between these forms are found in northern Borneo and elsewhere in the species range.

2. Most collections are glabrous on all parts, but some from the Malay Peninsula are white puberulous on leafy twigs, petioles, etc.

3. The identity of the single and sterile collection from Bali is not certain.

62. Ficus tristaniifolia Corner

Ficus tristaniifolia Corner, Gard. Bull. Singapore 17 (1960) 397; 21 (1965) 22; Kochummen, Tree Fl. Malaya 3 (1978) 159; Tree Fl. Sabah & Sarawak 3 (2000) 224.

Tree small, hemi-epiphytic. *Branches* drying brown to dark grey. *Leafy twigs* 2–4 mm thick, ± angular, glabrous; periderm persistent. *Leaves* spirally arranged; lamina subobovate to obovate, 4–9 by 1.5–4.5 cm, coriaceous, apex rounded, base obtuse, margin revolute or flat; both surfaces glabrous; midrib (at least the lower part) ± impressed above, lateral and smaller veins or also the apex of the midrib invisible; waxy gland at the base of the midrib; petiole 0.5–1 cm long, 1.5–2 mm thick, glabrous, drying brown; stipules 0.5–1(–1.2) cm long, glabrous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 3–5 mm long, (sub)equal, glabrous, persistent; re-

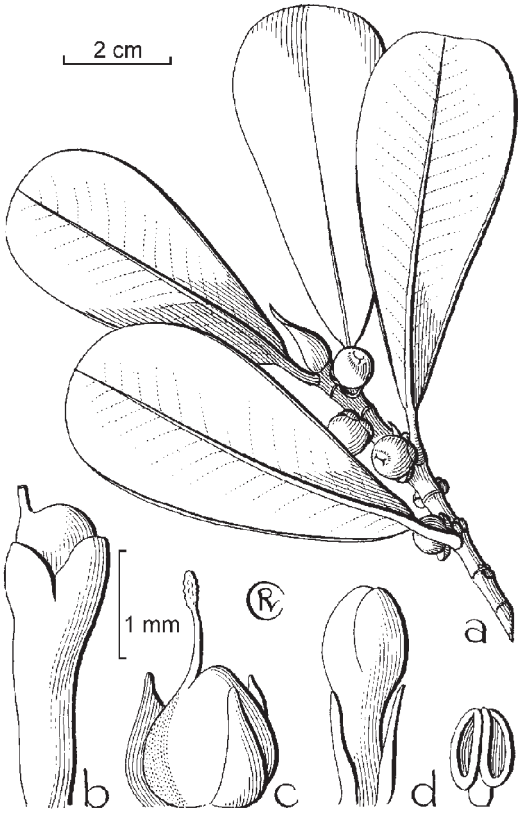


Fig. 130. *Ficus tristaniifolia* Corner. a. Leafy twig with figs; b. short-styled flower; c. long-styled flower; d. staminate flower, interfloral bracts, and stamen (all: *SF 36698*).

ceptacle subglobose, 0.8–1 cm diam. when dry, glabrous, colour at maturity unknown, apex convex, ostiole c. 2 mm diam., flat, closed, the 3 upper ostiolar bracts imbricate; wall (almost) smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red. — **Fig. 124m–s, 130.**

Distribution — *Malesia*: Malay Peninsula, Borneo.

Habitat — Forest, mostly swamp forest, at low altitudes.

Note — This species is in many features similar to *F. spathulifolia*. It differs in that not only the tertiary and smaller venation is invisible or nearly so as in *F. spathulifolia*, but also in the lateral veins both above and beneath.

63. Ficus xylophylla (Wall. ex Miq.) Miq.

Ficus xylophylla (Wall. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; King, Sp. Ficus 1 (1887) 29, t. 28; Fl. Brit. India 5 (1888) 503; Boerl., Bull. Inst. Bot. Buitenzorg 5 (1900) 29; Renner, Bot. Jahrb. Syst. 39 (1907) 381; Merr., Enum. Born. (1921) 228; Ridl., Fl. Malay Penins. 3 (1924) 332; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1016; Corner, Wayside Trees (1940) 690; Gard. Bull. Singapore 21 (1965) 16; Kochummen, Tree Fl. Malaya 3 (1978) 162; Tree Fl. Sabah & Sarawak 3 (2000) 317. — *Urostigma xylophyllum* Wall. ex Miq., London J. Bot. 6 (1847) 577; Fl. Ind. Bat. 1, 2 (1859) 352, t. 23.

Tree up to 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 scars of the stipules); periderm persistent. *Leaves* spirally arranged; lamina elliptic to oblong to (sub)obovate (to oblanceolate), 13–25(–35) by 6–13(–17) cm, (thickly) coriaceous, apex rounded to short-acuminate, base obtuse to cuneate or to 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, up 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 flat 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, (1 or) 2 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.

Distribution — Laos, Thailand; in *Malesia*: Sumatra (incl. Riouw, Lingga, Banka), Malay Peninsula, Borneo.

Habitat — Forest, at low altitudes; often nutrient-poor (e.g. sandy) soils.

Note — This species shows clear affinities to *F. crassiramea*.

Section Stilpnophyllum

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Stilpnophyllum* Endl., Gen. Pl. Suppl. 4, 2 (1847) 35; Sata, J. Soc. Trop. Agr. Taiwan 6 (1934) 17; Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 178; Corner, Gard. Bull. Singapore 17 (1960) 374; 21 (1965) 24.

Visiania Gasp., Giorn. Bot. Ital. 2 (1844) 216, non DC. 1844.

Macrophthalmia Gasp., Rendiconti Reale Accad. Sci. Fis. 25 (1845) 83; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 345. — *Urostigma* Gasp. subg. *Macrophthalmia* (Gasp.) Miq., Fl. Ind. Bat. 1, 2 (1859) 347.

Trees, mostly hemi-epiphytic, often large. *Leaves* spirally arranged, sometimes subdistichous; lamina symmetric, margin entire; tertiary venation largely parallel to the lateral veins and often slightly weaker than the primary lateral veins; stipules often relatively long. *Figs* axillary; basal bracts 2 or 3, early caducous (and ± cucullate) or (sub)persistent; ostiole slit-shaped or tri-radiate and the upper ostiolar 2 or 3 bracts descending, thickened at the base, or the ostiole circular and the 3 upper ostiolar bracts horizontal and not thickened; wall ± clearly differentiated into a hard outer layer (not becoming fleshy at maturity) and an inner layer which can be thick and in which the fruits are partly to entirely embedded; internal hairs absent. *Staminate flowers* disperse; stamens 1 (or 2); thecae fused over the top of the filament, dehiscent with a single crescentic (or circular) slit or thecae free and each dehiscent with a longitudinal slit. *Tepals* reddish. *Stigmas* often bifid, not distinctly papillate. *Fruits* often (partly or entirely) embedded in the inner layer of the wall of the fig or the swollen pedicels.

DISTRIBUTION

Section *Stilpnophyllum* comprises 20 species. It is the only subdivision of the genus distinctly centred in Australia. The disjunct occurrence of *F. elastica* in the western Malesian region and the Asian mainland is noteworthy.

MORPHOLOGY

Habit — The species occurring in Malesia can become trees taller than 30 m, *F. hesperidiiformis* even up to 60 m tall; *F. brachypoda* becomes up to 15 m tall. Several Australian species are usually or always hemi-epilithic (lithophytic; Dixon 2001).

Leaves — The section is characterized by the lamina with the tertiary venation largely parallel to the secondary veins; the primary lateral veins are often slightly stronger than the secondary (and tertiary) ones. Such venation is found in groups of species of other sections of subg. *Urostigma* (e.g., the species of the *F. benjamina*-group of sect. *Conosycea*, *F. elasticoides* De Wild. of sect. *Galoglychia*, and *F. sphenophylla* Standl. of sect. *Americana*). The stipules are often very long. Some species of the neotropical section of subg. *Pharmacosycea*, e.g., *F. insipida* Willd. and *F. yoponensis* Desv., are strikingly similar to many *Stilpnophyllum* species in the venation of the lamina and the very long stipules.

Many species show considerable differences in the dimensions of the leaves. These differences occur on individuals, but probably also between individuals (in the same area or geographically separated). Individuals with small leaves tend to bear relatively small figs and often have relatively slender twigs.

Indumentum — In many Australian species, brown indumentum consisting of elongate brown pluricellular (as described by Renner 1907) hairs can be found, as on the lower surface of the lamina (e.g., in the areoles of the lower surface of the lamina of *F. destruens* C.T. White and *F. pleurocarpa* F. Muell.). Such indumentum is not found in the Malesian region.

Ostiole — In most species (subsect. *Malvanthera*), the aperture of the ostiole is triradiate or slit-shaped. The upper 2 or 3 ostiolar bracts are descending, either to halfway the ostiolar tunnel or down into the fig cavity. They are thickened and often form short gibbous ribs around the ostiole. The other ostiolar bracts are also ± clearly descending. If there are 3 upper ostiolar bracts, then they are not always equally strongly developed, if one of them is weakly developed the aperture may tend to be slit-shaped. In *F. elastica* (sect. *Stilpnophyllum*), however, the ostiole is circular with 3 coriaceous (not thickened) horizontal imbricate bracts closing the entrance. Only the lower ostiolar bracts are descending as usual in the genus. Subsect. *Malvanthera* shows similarities to the African sect. *Galoglychia* in the descending ostiolar bracts. In the latter section the number of upper ostiolar bracts is two, only occasionally three.

Fig wall — The wall of the fig is hard and often clearly differentiated in a crustaceous outer layer and a softer inner layer in which the fruits often are embedded. This inner

layer can be continuous, interrupted with mostly several flowers in one entity, or it apparently consists of the swollen pedicels of the pistillate flowers. The outer layer often forms a plug-like structure around the ostiole. In species with a thick inner layer, the outer layer becomes separated from the inner layer and (probably) disintegrates, exposing the inner layer with the (embedded) fruits.

Basal bracts — In the majority of the species the basal bracts are early caducous. These bracts are mostly more or less clearly cucullate and enclose the young receptacle. The figs are subtended by bracts which are usually also cucullate and early caducous; they represent the prophylls. The apex of the peduncle is often ± clearly dilated, sometimes strongly so and forming a shallow to deep cupule. However, in some species, *F. hesperidiiformis*, the related Australian species *F. crassipes* F.M. Bailey and *F. pleurocarpa*, as well as in the Australian species *F. triradiata* Corner, the basal bracts are semicircular, subcrescentic or ovate and (sub)persistent. They are large in *F. triradiata*, but (very) small in the other species. In *F. hesperidiiformis*, bracts subtending the figs can be found. They probably represent prophylls, are lanceolate to almost filiform, and are sometimes subpersistent.

Stamens — The anthers of most species are unusual. They are reniform, covering the apex of the filament and dehiscing with a single slit (subsect. *Malvanthera*). The anther is even more peculiar in many specimens of *F. hesperidiiformis*. The thecae are entirely fused forming a thick disc on the filament. This peltate anther opens with an equatorial slit. Such stamens are also known in the neotropical *Brosimum alicastrum* Sw.; they occur only in subsp. *alicastrum*, whereas the stamens are normal in subsp. *bolivarense* (Pittier) C.C. Berg (1972: 170, t. 62). The anthers occasionally have two separate thecae with longitudinal dehiscence (Dixon 2001; see also Fig. 21e). It is likely that the seemingly monothecal anther is formed by two thecae fused over the top of the filament.

Stigmata — The stigmata are often bifid and not brush-like by the conspicuous papillae in the other sections of *Urostigma*.

TAXONOMY

Relationships — Similarities in the construction of the entrance of the ostiole might be an indication of a rather close relationship between sect. *Malvanthera* and the African sect. *Galoglychia*. These two sections occur as two 'blocks' South of the main track in the genus, from the Pacific through Malesia and mainland Asia to Africa. The differences in the morphology and differentiation patterns suggest that sect. *Stilpnophyllum* and sect. *Galoglychia* are not closely related.

Similarities in venation might be an indication of relationships between sect. *Stilpnophyllum* and the *F. benjamina*-group in sect. *Urostigma* subsect. *Conosycea*.

Subdivision — Two subsections are recognized. The similarities between this species and the group of Australian and the eastern Malesian species, as in the venation of the lamina, the length of the stipules, the cucullate caducous basal bracts, justify inclusion in the same section. *Ficus elastica* is distinct in the construction of the upper part of the ostiole, in the anthers with separate thecae, and in the connate stipules.

POLLINATORS

The pollinators of section *Stilpnophyllum* belong to the genus *Pleistodontes* (Wiebes 1994).

References: Berg, C.C., Olmedieae and Brosimeae (Moraceae). Flora Neotropica Monograph 7 (1972). New York. — Dixon, D.J., A chequered history; the taxonomy of Ficus platypoda and F. leucotricha (Moraceae: Urostigma sect. Malvanthera) unravelled. Austral. Syst. Bot. 14 (2001) 535–563. — Renner, O., Beiträge zur Anatomie und Systematik der Artocarpeen und Conocephaleen, insondere der Gattung Ficus. Bot. Jahrb. Syst. 39 (1907) 319–448. — Wiebes, J.T., The Indo-Australian Agaoninae (pollinators of figs). Verh. Kon. Ned. Akad. Wet., afd. Natk., 2de reeks, 92 (1994) 1–208.

Section Stilpnophyllum subsection Stilpnophyllum

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Stilpnophyllum* Endl. subsect. *Stilpnophyllum* (Endl.) C.C. Berg, Blumea 49 (2004) 467. — *Ficus* L. ser. *Elasticae* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287.

Stipules connate. *Upper ostiolar* bracts well developed horizontal and imbricate, closing the entrance, in the ostiole the upper bracts horizontal and interlocking, only the lower ones descending. *Anthers* with 2 distinct thecae, each dehiscing longitudinally.

Distribution — Monotypic; Asian mainland and western Malesia; widely cultivated.

64. Ficus elastica Roxb.

Ficus elastica Roxb., Hort. Bengal. (1814) 65; Hornem., Hort. Bot. Hafn., Suppl. (1819) 7; Link, Enum. Hort. Berol. 2 (1822) 448; Blume, Bijdr. (1825) 446; Roxb., Fl. Ind., ed. Carey 3 (1832) 541; Griff., As. J. n.s. (1839) 14; Wight, Ic. 2 (1843) t. 663; Kunth, Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 233; Griff., Ic. Pl. Asiat. 4 (1854) t. 552; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 265, 287; Kurz, Forest Fl. Burma 2 (1877) 444; Solms, Bot. Zeit. (1885) 532; King, Sp. Ficus 1 (1887) 45, t. 54; in Hook.f., Fl. Brit. India 5 (1888) 508; Giesenh., Flora 73 (1890) 1 (cystoliths); Watt, Dict. Econ. Prod. India 3 (1890) 350; Éc. Div. Agr. Comm. Indo-Chine 58 (1906) 1104; Koord. & Valeton, Bijdr. Boomsoort. Java 11 (1906) 126; Koord., Notizbl. Berl.-Dahl. (1907) n. 40 (fungi on *F. elastica*); Renner, Bot. Jahrb. Syst. 39 (1907) 381; Kamerling, Ber. Deut. Bot. Ges. 31 (1913) 488 (hydathodes); Simon, Jahrb. Syst. Wiss. Bot. 54 (1914) 98; Koord., Atlas 4 (1916) t. 740, 741; Ridl., Fl. Malay Penins. 3 (1924) 334; K. Heyne, Nutt. Pl. Ned.-Indië (1927) 750; Gagnep., Fl. Indo-Chine 5 (1928) 777; Burkill, Dict. Econ. Prod. Malay Penins. (1935) 1007; Diels, Bot. Jahrb. Syst. 67 (1935) 181; Corner, Wayside Trees (1940) 677, t. 202, 203, f. 252; L.H. Bailey & E.Z. Bailey, Hort. Sec. (1941) 308; L. Ajello, Amer. J. Bot. 28 (1941) 589 (cystoliths); Guillaumin, Bull. Mus. Hist. Nat. (Paris), Sér. 2, 21 (1949) 722; P. Hiltz, Rev. Gén. Bot. 57 (1950) 453 (cystoliths); M.F. Barrett, Am. Midl. Nat. 45 (1951) 129; Renner, Ber. Deut. Bot. Ges. 65 (1952) 297 (chimera); Worth., Ceylon Trees (1959) f. 406; Backer & Bakh.f., Fl. Java 2 (1965) 23; Corner, Gard. Bull. Singapore 21 (1965) 24; Rev. Handbook Fl. Ceyl. 1, 2 (1977) 43, t. 18; Kochummen, Tree Fl. Malaya 3 (1978) 146. — *Visiania elastica* (Roxb.) Gasp., Giorn. Bot. Ital. 2 (1844) 216. — *Macrophthalmia elastica* (Roxb.) Gasp., Rendiconti Reale Accad. Sci. Fis. 25 (1845) 83; Ann. Sci. Nat. Bot., Sér. 3, 3 (1845) 345; Ric. Caprifico (1845) 83, t. 8. — *Urostigma elasticum* (Roxb.) Miq., London J. Bot. 6 (1847) 578; Fl. Ind. Bat. 1, 2 (1859) 347, t. 23E. — *Stilpnophyllum elasticum* (Roxb.) Drury, Handb. Ind. Fl. 3 (1869) 225.

Ficus elastica Roxb. var. *benghalensis* Blume, Bijdr. (1825) 446.

Ficus taeda Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 14, nom. inval. in synon.

Ficus cordata Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 14, nom. inval. in synon., non Thunb. 1786.

Urostigma elasticum (Roxb.) Miq. var. *latifolium* Miq., London J. Bot. 6 (1847) 578.
Urostigma odoratum Miq., Pl. Jungh. (1851) 49; Fl. Ind. Bat. 1, 2 (1859) 348, t. 24B. — *Ficus elastica* Roxb. var. *odorata* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 265, 287.
Urostigma circumscissum Miq., Pl. Jungh (1854) 292; Fl. Ind. Bat. 1, 2 (1859) 344. — *Ficus elastica* Roxb. var. *minor* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287.
Urostigma karet Miq., Fl. Ind. Bat. 1, 2 (1859) 348. — *Ficus elastica* Roxb. var. *karet* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 265. — *Ficus karet* (Miq.) King, Sp. Ficus 2 (1888) index 3.
Ficus clusiifolia Summerh., J. Arnold Arbor. 10 (1929) 152, non Schott in Spreng. 1827. — *Ficus skytinoderma* Summerh., J. Arnold Arbor. 14 (1933) 62; Diels, Bot. Jahrb. Syst. 67 (1935) 182.

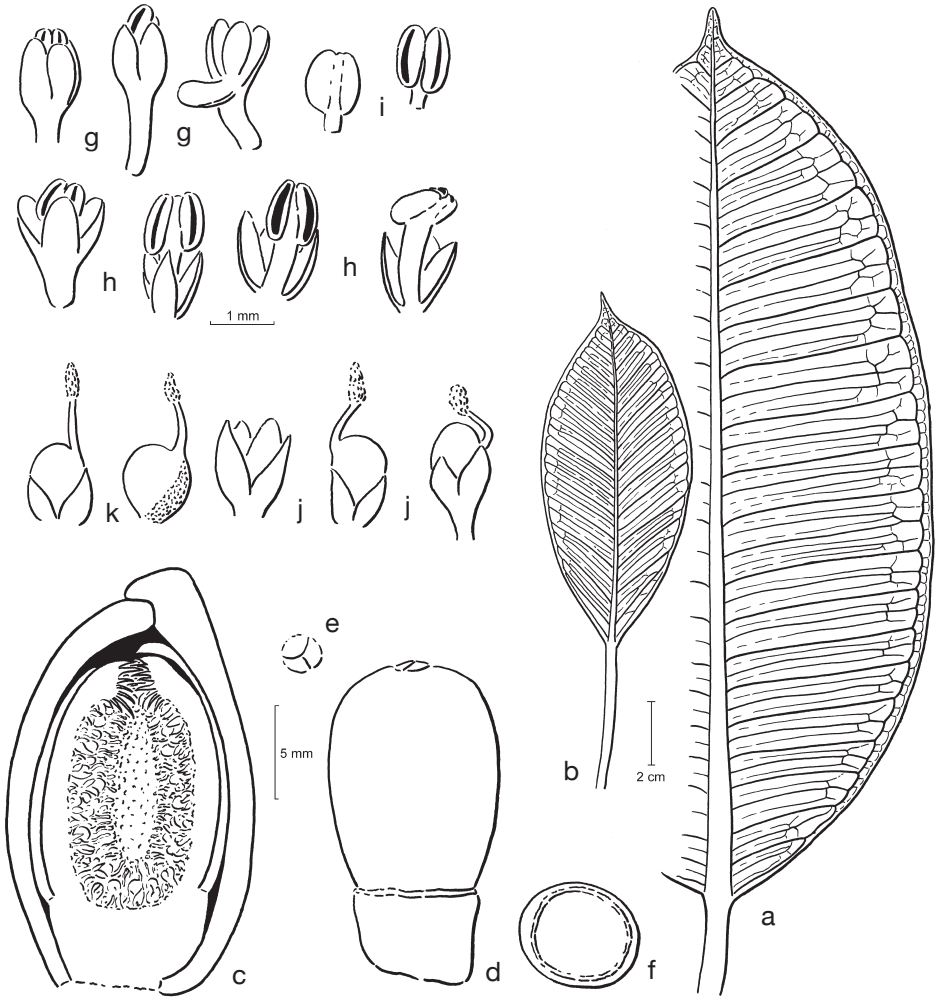


Fig. 131. *Ficus elastica* Roxb. a. Leaf of sapling; b. leaf of adult; c. fig with basal bracts enclosed by calyptrate bud cover; d. fig without basal bracts; e. ostiole; f. apex of the peduncle; g. staminate flowers; h. staminate flowers; i. stamens; j. short-styled flowers and perianth; k. long-styled flowers and pistil (a–f, j, k: collections used unknown; g, i: *SFN 21187*; h: *Brass 641*). From Philos. Trans., Ser. B, 281 (1978) 368.

Ficus elastica Roxb. var. *belgica* L.H. Bailey & E.Z. Bailey, Hort. Sec. (1941) 308.
Ficus elastica Roxb. var. *rubra* L.H. Bailey & E.Z. Bailey, Hort. Sec. (1941) 308.
Ficus elastica Roxb. var. *decora* Guillaumin, Bull. Mus. Hist. Nat. (Paris), Sér. 2, 21 (1949) 722 (*F. decora* Hort., *F. opulens* Hort.).

Tree up to 30 m tall, terrestrial or hemi-epiphytic. *Leafy twigs* 3–5 mm thick, angular, glabrous or (minutely) white puberulous. *Leaves* spirally arranged; 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); upper glabrous, lower surface 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), initially enclosed by up to 2.5 cm long calyptrate bud covers; peduncle 0.2–0.5(–0.8) mm long, the apex dilated; basal bracts 3, c. 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. — **Fig. 131.**

Distribution — NE India, Sikkim, Myanmar; in *Malesia*: Malay Peninsula (northern), Sumatra, Java. The natural range of distribution is certain. It is certainly natural in NE India, Sikkim, Myanmar, and Perak (Malaysia) and probably occurs naturally in Sumatra and Java. It is frequently planted in the range indicated, as well as elsewhere in the tropics (and subtropics).

Habitat — Forest, often on cliffs and limestone hills, at low altitudes.

Notes — 1. The species can be deciduous (*Schodde 2373*, New Guinea).

2. Staminate flowers are usually abundantly present.

Section Stilpnophyllum subsection Malvanthera

Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Stilpnophyllum* Endl. subsect. *Malvanthera* (Corner) C.C. Berg, Blumea 49 (2004) 467. — *Ficus* L. subg. *Urostigma* (Gasp.) Miq. sect. *Malvanthera* Corner, Gard. Bull. Singapore 17 (1960) 374; 21 (1965) 24; D.J. Dixon, Austral. Syst. Bot. 14 (2001) 125, 133, 535. — *Ficus* L. subg. *Urostigma* (Gasp.) Miq. sect. *Malvanthera* Corner ser. *Malvanthereae* Corner, Gard. Bull. Singapore 17 (1960) 375. — *Ficus* L. subg. *Urostigma* (Gasp.) Miq. sect. *Malvanthera* Corner ser. *Malvanthereae* Corner subser. *Malvanthereae* Corner, Gard. Bull. Singapore 17 (1960) 375.
Mastosuke Raf., Sylv. Tellur. (1838) 59.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Malvanthera* Corner ser. *Cyclanthereae* Corner, Gard. Bull. Singapore 17 (1960) 375.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Malvanthera* Corner ser. *Malvanthereae* Corner subser. *Eubracteatae* Corner, Gard. Bull. Singapore 17 (1960) 375.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Malvanthera* Corner ser. *Malvanthereae* Corner subser. *Hesperidiiformes* Corner, Gard. Bull. Singapore 17 (1960) 375.
Ficus L. subg. *Urostigma* (Gasp.) Miq. sect. *Malvanthera* Corner ser. *Malvanthereae* Corner subser. *Platypodeae* Corner, Gard. Bull. Singapore 17 (1960) 375.

Stipules free. *Upper ostiolar bracts* 2 or 3, descending, aperture tri-radiate or slit-shaped. *Anthers* reniform (or peltate) at the apex of the filament and dehiscing with a single, crescentic or equatorial slit, occasionally two thecae dehiscing longitudinally.

Distribution — Nineteen species, of which 14 in Australia; 2 of them extend to adjacent parts of Malesia and/or the Pacific. One species is confined to Malesia and one to the Solomon Islands, and two occur both in Malesia and Melanesia.

Subdivision — Three groups of species can be recognized:

a. Species with (sub)persistent semicircular to ovate basal bracts: small in *F. crassipes*, *F. hesperidiiformis*, and *F. pleurocarpa*; large in *F. triradiata*.
b. Species with caducous basal bracts and with 2 upper ostiolar bracts and a slit-shaped aperture: *F. glandifera* and *F. rhizophoriphylla* in Malesia; *F. baola* C.C. Berg in the Solomon Islands, and *F. destruens* in Australia.
c. Species with caducous basal bracts and with 3 upper ostiolar bracts and a tri-radiate aperture: the other species.

65. Ficus brachypoda (Miq.) Miq.

Ficus brachypoda (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268, 287; D.J. Dixon, Austral. Syst. Bot. 14 (2001) 549. — *Urostigma brachypodum* Miq., London. J. Bot. 6 (1837) 562.

Ficus eugenioides (Miq.) F. Muell. var. *puberula* Benth., Fl. Austral. 6 (1873) 167. — *Ficus obliqua* G. Forst. var. *puberula* (Benth.) Corner, Gard. Bull. Singapore 17 (1960) 403; 21 (1965) 27.

Urostigma platypodum A. Cunn. ex Miq. forma '*minor glabrior*' Miq., London J. Bot. 6 (1847) 562. — *Urostigma platypodum* A. Cunn. ex Miq. forma *glabrior* (Miq.) Miq., J. Bot. Néerl. 1 (1861) 236. — *Ficus platypoda* (A. Cunn. ex Miq.) Miq. var. *minor* (Miq.) Benth., Fl. Austral. 6 (1873) 169.

Urostigma vittelinum Miq., J. Bot. Néerl. 1 (1861) 236. — *Ficus vittelina* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268.

Urostigma lachnocaulon Miq., J. Bot. Néerl. 1 (1861) 238. — *Ficus lachnocaula* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 268. — *Ficus platypoda* (A. Cunn. ex Miq.) Miq. var. *lachnocaula* (Miq.) Benth., Fl. Austral. 6 (1873) 169.

Tree up to 15 m tall, terrestrial or hemi-epiphytic. *Leafy twigs* 2–4 mm thick, angular, glabrous or minutely white puberulous; periderm usually flaking off. *Leaves* spirally arranged; lamina oblong to (broadly) elliptic to (sub)ovate, 2.5–13 by 1.5–6.5 cm, coriaceous, apex short-acuminate to subacute or to obtuse, base cuneate to rounded (to subcordate), sometimes slightly attenuate, margin glabrous or minutely puberulous; upper surface sparsely minutely puberulous, mainly on the midrib, or glabrous, lower surface sparsely minutely puberulous on the veins or glabrous, sometimes ± clearly tessellate; cystoliths on both sides, only beneath or absent; lateral veins 8–16 pairs, the basal one slightly or hardly distinct, tertiary venation parallel to the lateral veins; waxy gland at the base of the midrib (often faint); petiole 0.2–0.8 or (1.5–)3–6 cm long, minutely puberulous or glabrous; stipules 1–2(–3) cm long, minutely white puberulous or glabrous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.1–0.2 or 0.2–0.5(–0.8) cm long, the apex ± dilated; basal bracts 3, 2(–5?) mm long, early caducous; receptacle subglobose, 0.4–1.2 cm diam. when dry, sparsely minutely white puberulous or glabrous, at maturity yellow to red, apex slightly umbonate, ostiole tri-radiate; inner layer of the wall thin. *Fruits* not embedded in the wall.

Distribution — Malesia to northern and central Australia; in *Malesia*: Lesser Sunda Islands (Flores, Sumba, Timor, Roti).

Habitat — Among rocks, at low altitudes.

Notes — 1. The material from Flores differs from that of the other islands in longer petioles, (1.5–)3–6 vs 0.2–0.8 cm, longer peduncles, 0.2–0.5(–0.8) vs 0.1–0.2 cm long, and somewhat larger fig receptacle, 0.6–0.12 vs 0.4–0.8 cm diam. when dry.

2. Material from Sumba was referred to *F. platypoda* var. *platypoda* and var. *cordata* (see Corner 1965: 27).

3. The material included in the current treatment has been identified by Dr. Dixon (Australia).

66. Ficus glandifera Summerh.

Ficus glandifera Summerh., J. Arnold Arbor. 13 (1932) 99; in Hook. Ic. Pl. (1933) t. 3188; Corner, Gard. Bull. Singapore 21 (1965) 25; Philos. Trans., Ser. B, 253 (1967) 69, t. 10.
Ficus glandifera Summerh. var. *brachysyce* Corner, Gard. Bull. Singapore 17 (1960) 402.

Tree up to 40 m tall, hemi-epiphytic. *Leafy twigs* 3–6 mm thick, angular, glabrous or white puberulous. *Leaves* spirally arranged; lamina elliptic to oblong or to (sub)ovate, 6–15(–24) by 2.5–9(–13) cm, coriaceous, apex short-(sub)acuminate to subacute, base rounded to cuneate, often slightly decurrent; upper and lower surface glabrous; cystoliths on both sides; lateral veins 10–25(–30) pairs, the basal lateral veins hardly distinct, tertiary venation parallel to the lateral veins; waxy gland at the base of the midrib; petiole 2–5(–6.5) cm long, glabrous; stipules 2–5 cm long (on opening shoots up to 16 cm long), glabrous or white puberulous, caducous. *Figs* axillary, in pairs or solitary, subsessile or with a peduncle up to 0.6 cm long, extended into a (puberulous or glabrous) cupule; basal bracts 3, 5–6 mm long, puberulous, caducous; receptacle ellipsoid to subovoid to cylindrical or to subglobose, 0.8–1.8 cm diam. when dry, glabrous or sparsely puberulous, yellow to orange to red or purple at maturity, maculate, apex ± umbonate, ostiole slit-shaped. *Fruits* partly embedded in the inner layer of the fig wall. — **Fig. 132, 133a–g.**

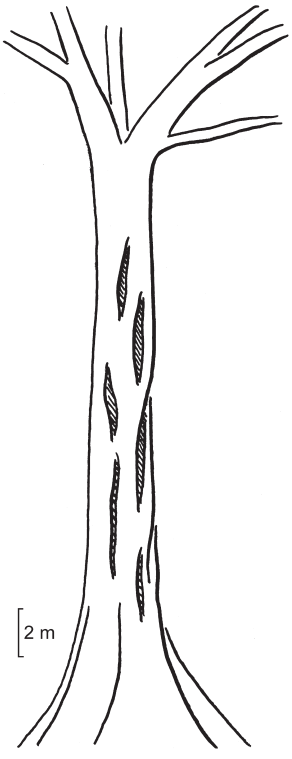


Fig. 132. *Ficus glandifera* Summerh. Aerial root-system around trunk of host-tree, Papua New Guinea, Oomsis, near Lae.

Distribution — Solomon Islands, New Hebrides; in *Malesia*: Celebes (south-eastern), New Guinea (incl. New Britain and New Ireland).

Habitat — Forest, at low altitudes, sometimes on limestone.

Note — Most collections have ellipsoid figs, but in some the figs are subglobose and often somewhat smaller (and always? subsessile). The lamina tends to be relatively small in collections with subglobose figs, which were included in var. *brachysyce*. This form may be the only one in the western part of the species range (Celebes and Irian Jaya), but it is also in the eastern part.

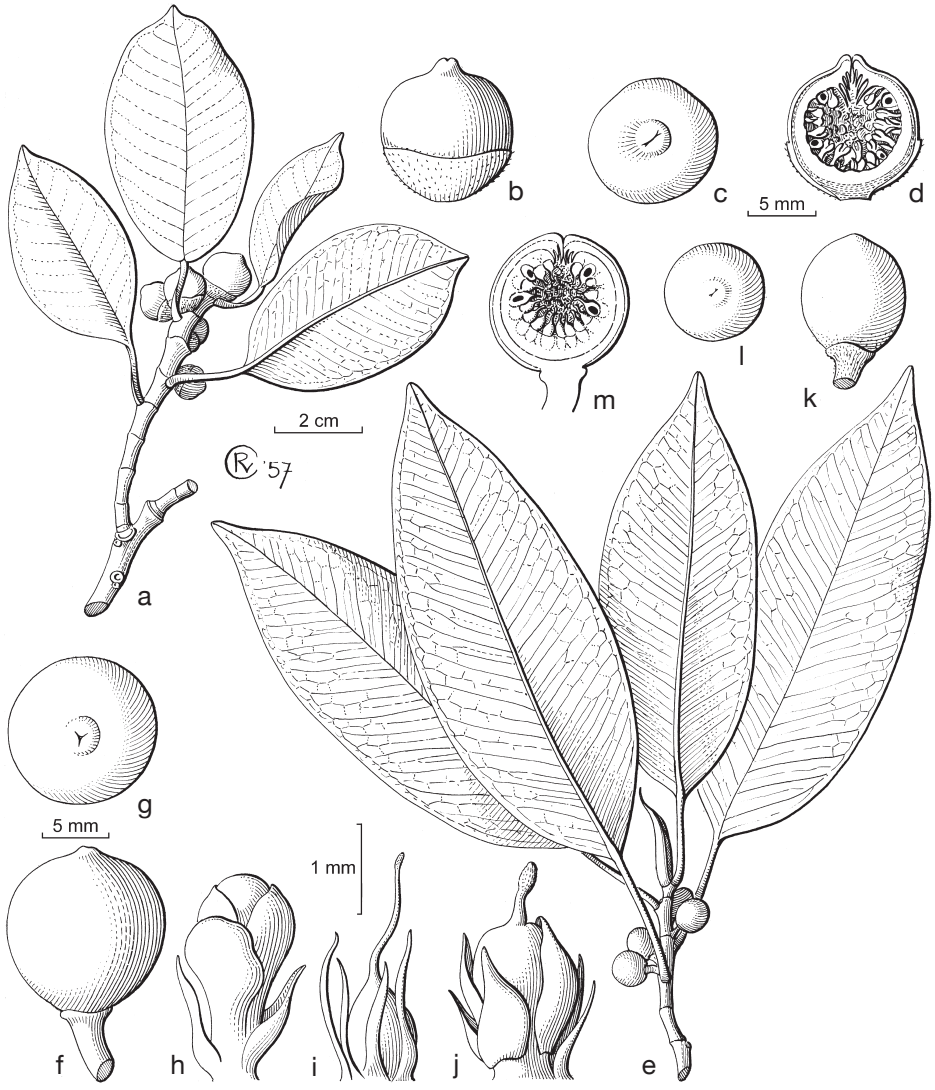


Fig. 133. a–d: *Ficus glandifera* Summerh. a. Leafy twig with figs; b. fig; c. ostiole; d. fig. — e–j: *Ficus obliqua* G. Forst. e. Leafy twig with figs; f. fig; g. ostiole; h. staminate flower and interfloral bracts; i. long-styled flower; j. short-styled flower. — k–m: *Ficus rhizophoriphylla* King. k. Fig; l. ostiole; m. fig (a–d: *NGF 5218*; e, i: *Beguin 1410*; f–h, j: *Carr 14292*; k, l: *Carr 12655*; m. *Carr 12893*).

67. Ficus hesperidiiformis King

Ficus hesperidiiformis King, J. Asiat. Soc. Bengal 55, 2 (1887) 401; Sp. Ficus App. (1889) 3, t. 226; Diels, Bot. Jahrb. Syst. 67 (1935) 181; Corner, Gard. Bull. Singapore 21 (1965) 28.
Ficus sterrocarpa Diels, Bot. Jahrb. Syst. 67 (1935) 179; Summerh., J. Arnold Arbor. 22 (1941) 81; Corner, Gard. Bull. Singapore 21 (1965) 28.
Ficus sterrocarpa Diels var. *pubigemma* Diels, Bot. Jahrb. Syst. 67 (1935) 180.
Ficus sclerotiara Diels, Bot. Jahrb. Syst. 67 (1935) 180; Summerh., J. Arnold Arbor. 22 (1941) 81.
Ficus xylosycia Diels, Bot. Jahrb. Syst. 67 (1935) 180; Corner, Gard. Bull. Singapore 21 (1965) 28; Philos. Trans., Ser. B, 253 (1967) 71, t. 10.
Ficus cylindrocarpa Diels, Bot. Jahrb. Syst. 67 (1935) 181. — *Ficus xylosycia* Diels var. *cylindrocarpa* (Diels) Corner, Gard. Bull. Singapore 17 (1960) 404.
Ficus myrmekiocarpa Summerh., J. Arnold Arbor. 22 (1941) 82. — *Ficus hesperidiiformis* King var. *myrmekiocarpa* (Summerh.) Corner, Gard. Bull. Singapore 17 (1960) 404.
Ficus mafuluensis Summerh., J. Arnold Arbor. 22 (1941) 83; Corner, Gard. Bull. Singapore 21 (1965) 28.
Ficus augusta Corner, Gard. Bull. Singapore 17 (1960) 403; 21 (1965) 28.
Ficus heteromeka Corner, Gard. Bull. Singapore 18 (1961) 85; 21 (1965) 28.

Tree up to 60 m tall, hemi-epiphytic. *Leafy twigs* 2.5–10(–15) mm thick, angular, usually with a ring of ± conspicuous lenticels below the scars of the stipules, glabrous or white puberulous. *Leaves* spirally arranged (to subdistichous); lamina oblong to (broadly) elliptic to (sub)ovate, 5–30(–35) by 2.5–16 cm, (thickly) coriaceous (to subcoriaceous), apex short-(sub)acuminate to acute, base rounded to subcordate or to cuneate, sometimes shortly attenuate; upper surface glabrous (or sparsely puberulous on the midrib), lower surface glabrous (or sparsely to densely puberulous on the midrib); cystoliths on both sides (or only above); lateral veins 15–30 pairs, basal lateral veins 1–3 pairs, tertiary venation parallel to the lateral veins; waxy gland at the base of the midrib; petiole 1.5–10(–15) cm long, glabrous (or puberulous); stipules (3–)8–25(–30) cm long, glabrous or puberulous (to subsericeous), caducous (or subpersistent). *Figs* axillary, in pairs or solitary, often subtended by lanceolate to filiform, caducous or sometimes subpersistent bracts; sessile or 1–4(–5) cm long pedunculate, the apex sometimes clearly but mostly slightly or not dilated, long peduncles often recurved; basal bracts 3, 0.5–3 mm long, subcrescentic to semicircular or ovate, subpersistent or caducous; receptacle ellipsoid to cylindrical or to subglobose, 1–5 cm diam. and 2–10 cm long when dry, up to 1.5 cm long stipitate or non-stipitate, puberulous or glabrous, red to purple at maturity, maculate, apex ± umbonate to rostrate, ostiole tri-radiate (to almost slit-shaped), surrounded by 3 equally strong or 2 strong and 1 (much) weaker, gibbous ribs; outer layer of the wall hard, crustaceous; inner (whitish) layer thick, with the fruits (partly) embedded. *Anthers* crescentic and dehiscent with a slit over the top of the anther or (sub)peltate and dehiscent with an equatorial slit, occasionally separate thecae, dehiscing longitudinally. Fruits partly embedded in the inner layer of the wall.

Distribution — From New Guinea to the Solomon Islands; in *Malesia*: New Guinea (mainly eastern).

Habitat — Forest, at altitudes up to c. 2600 m.

Notes — 1. This species, as currently delimited, is very variable as with regard to the presence of indumentum on various parts, the size and texture of the lamina, the shape and size of the receptacle, the length of the peduncle, the shape of the basal bracts, and

the shape of the ostiole. Moreover, the anther varies. It is mostly reniform with crescentic dehiscence, but can be discoid with equatorial dehiscence.

2. Material which was included in *F. xylosycia* by Corner has relatively small leaves (mostly 5–15 cm long) and often also relatively small figs (1–2 cm diam.) and more slender leafy twigs, but in other features indistinguishable from the material with larger leaves and figs. The two 'forms' are linked by intermediates. A note (*M. Coode NGF 32553*) that leaves of clearly different sizes are found on the same tree, might (partly) explain the two leaf size categories. Most of the collections with these small leaves are made at altitudes between 1000 and 2600 m. However, a form with a slender peduncle and small fig receptacle with a rostrate apex (recognized as var. *cylindrocarpa* by Corner 1960) is found at low altitudes (at or near sea level); this form is linked to that from higher altitudes with intermediates.

3. *Carr 15864* (from Papua, at c. 2000 m) is somewhat distinct by the broadly elliptic to ovate to suborbicular lamina with about 15 pairs of lateral veins and a pair of relatively strong basal lateral veins.

4. Material with discoid anthers with equatorial dehiscence has been identified as *F. hesperidiiformis*. It belongs, however, to *F. sterrocarpa*.

5. This species shows clear affinities to two Australian species: a) *F. crassipes* F.M. Bailey with leaves rather similar to the collection *Carr 15864* (mentioned above), but with shorter stipules; and b) *F. pleurocarpa*, but more clearly different in the pair of strong basal lateral veins and with brown indumentum in the areoles beneath.

68. Ficus obliqua G. Forst.

Ficus obliqua G. Forst., Fl. Ins. Austr. (1786) 77 n. 409; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 287; Rech., Denkschr. Kaiserl. Akad. Wiss. Math.-Naturwiss. Kl. Wien 85 (1910) 272; Summerh., J. Arnold Arbor. 13 (1932) 101; Bull. Bish. Mus. 141 (1936) 55; Occ. Pap. Bernice Pauahi Bishop Mus. 15, n. 9 (1939) 112; Corner, Gard. Bull. Singapore 21 (1965) 26; Philos. Trans., Ser. B, 253 (1967) 70, t. 11; D.J. Dixon, Austral. Syst. Bot. 14 (2001) 141. — *Urostigma obliquum* (G. Forst.) Miq., London J. Bot. 6 (1847) 563.

Ficus laevis Desf., Cat. Hort. Paris, ed. 3 (1829) 414, non Blume 1825.

Ficus sororia Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 16; Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 240.

Ficus sapotifolia Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 17; Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 240.

Urostigma eugenioides Miq., J. Bot. Néerl. 1 (1861) 238. — *Ficus eugenioides* (Miq.) F. Muell., Austral. Veg. (Intercol. Exhib. 1866/1867) n. 5 (1866) 26; Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286; Benth., Fl. Austral. 6 (1873) 166; F.M. Bailey, Queensl. Fl. 5 (1902) 1470; Compr. Cat. Qld. Pl. (1913) 486, f. 474; Domin, Bibl. Bot. 89 (1921) 564; W.D. Francis, Austr. Rain-For. Trees (1951) 76, f. 28–30.

Urostigma backhousei Miq., J. Bot. Néerl. 1 (1861) 240. — *Ficus backhousei* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 288.

Ficus boothiana Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 220, 299.

Ficus graeffii Warb., Bot. Jahrb. Syst. 25 (1898) 616.

Ficus virginea Banks & Sol. ex Hiern, J. Bot. 39 (1901) 2; F.M. Bailey, Compr. Cat. Qld. Pl. (1913) 485.

Ficus aphanoneura Warb., Feddes Repert. Spec. Nov. Regni Veg. 1 (1905) 80; Guillaumin, Fl. Nouv. Caléd. (1948) 97.

Ficus tryonii F.M. Bailey, Queensl. Agr. J. 17 (1906) 103; Compr. Cat. Qld. Pl. (1913) 486, f. 476.

Tree up to 40 m tall, hemi-epiphytic (or terrestrial?). *Leafy twigs* 1–5 mm thick, angular, minutely puberulous or glabrous. *Leaves* spirally arranged; lamina elliptic to oblong, (2.5–)3.5–13 by (0.8–)1–5 cm, coriaceous, apex (sub)acuminate, the acumen blunt to sharp, base cuneate; upper glabrous, lower surface glabrous; cystoliths on both sides or only above; lateral veins 10–15 pairs, the basal lateral veins hardly distinct, tertiary venation parallel to the lateral veins; waxy gland at the base of the midrib; petiole 0.5–2.5 cm long, glabrous; stipules 1–2.5(–3) cm long, minutely puberulous or glabrous, caducous. *Figs* axillary, in pairs or solitary; subsessile or with a peduncle up to 0.5 cm long, dilated; basal bracts 3, 1–5 mm long, cucullate, glabrous or sparsely minutely puberulous, early caducous; receptacle subglobose, 0.3–1 cm diam. when dry, glabrous, orange at maturity, maculate, apex slightly umbonate, ostiole tri-radiate (to almost slit-shaped); inner layer of the wall thin. *Fruits* basally embedded in the swollen pedicels. — **Fig. 133e–j.**

Distribution — Australia (Queensland, New South Wales), Solomon Islands, New Hebrides, Loyalty Islands, New Caledonia, Fiji, Tonga, Samoa, Niue; in *Malesia*: Moluccas (Ternate), New Guinea (incl. Admiralty Islands and New Britain).

Habitat — Forest, at altitudes up to 1300 m. In New Guinea and the Solomon Islands probably always elements of forest, hemi-epiphytic, becoming large trees. Elsewhere often small trees (max. 20 m tall), always (?) terrestrial, often near beaches or on cliffs or among or on rocks.

Notes — 1. Material with a slit-shaped aperture of the ostiole found in the Solomon Islands is excluded from the species and described as a new one, *F. baola* C.C. Berg (Blumea 47 (2002) 315).

2. This species can be distinguished from *F. brachypoda* of the Lesser Sunda Islands in the lamina being broadest in the middle, the persistent periderm of the twigs or the petioles shorter than 2.5 cm.

3. Collections from the Admiralty Islands and New Britain have small leaves and figs, matching those from the Solomon Islands and other islands in the Pacific region. The other collections (from New Guinea and the Moluccas) have larger leaves and figs.

69. Ficus rhizophoriphylla King

Ficus rhizophoriphylla King, J. Asiat. Soc. Bengal 55, 2 (1887) 410; Sp. Ficus App. (1889) 9, t. 232; Diels, Bot. Jahrb. Syst. 67 (1935) 182; Summerh., J. Arnold Arbor 10 (1929) 150; 22 (1941) 85; Corner, Gard. Bull. Singapore 21 (1965) 25.

Tree up to 35 m tall, hemi-epiphytic. *Leafy twigs* 3–5 mm thick, angular, minutely white puberulous. *Leaves* spirally arranged; lamina oblong to subobovate (or to elliptic), (4–)6–10(–14) by (1.5–)2–4(–5.5) cm, coriaceous, apex obtuse (to subacute or to very shortly acuminate), base obtuse to rounded, often slightly inequilateral; upper surface glabrous, lower surface glabrous, often ± clearly tessellate; cystoliths on both sides; lateral veins (9–)10–14 pairs, the basal lateral veins not or hardly distinct, tertiary venation parallel to the lateral veins; waxy gland at the base of the midrib; petiole 1.5–4(–6) cm long, (sub)glabrous; stipules 1.5–4 cm long (on opening shoots up to 16 cm long), (sparsely) minutely white puberulous, caducous. *Figs* axillary, in pairs

or solitary, subsessile or with a peduncle up to 0.5 cm long, ± dilated; basal bracts not seen, caducous; receptacle subglobose to ellipsoid, 0.4–1 cm diam. when dry, sparsely minutely white puberulous or glabrous, yellow to orange or to red at maturity, apex slightly umbonate, ostiole slit-shaped; inner part of the wall relatively thick (largely consisting of separate swollen pedicels?). *Fruits* basally embedded in the swollen pedicels. — **Fig. 133k–m.**

Distribution — In *Malesia*: New Guinea (eastern).

Habitat — Forest (or montane savannah), mostly at low altitudes.

Note — The species resembles *F. baola* C.C. Berg (Blumea 47 (2002) 315) from the Solomon Islands, from which it can be distinguished by the usually obtuse apex of the lamina, the longer petioles, and the absence of a distinct cupule.

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DUBIOUS and EXCLUDED

DUBIOUS NAMES

In a number of cases, partly already listed by Corner (Gard. Bull. Singapore 21 (1965) 94–96) names based on Malesian material could not be linked to any of the species currently recognised, because type material has not been traced, type material is in a state that identification is impossible, or descriptions are not clear enough.

Ficus argentea Blanco, Fl. Filip. (1827) 681; Merr., Sp. Blancoan. (1918) 129; Philipp. J. Sci 20 (1922) 368; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 216.

Ficus bordenii Merr., Publ. Gov. Lab. Philipp. 29 (1905) 11; Philipp. J. Sci., 1, Suppl. (1906) 46; Enum. Philipp. Flow. Pl. 2 (1923) 47; Corner, Gard. Bull. Singapore 10 (1939) 107, f. 7, 36; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 250.

Ficus cornifolia Kunth & C.D. Bouché, Ind. Sem. Hort. Berol. 1846 (1847) 19; Ann. Sci. Nat. Bot., Sér. 3, 7 (1847) 246.

Ficus crenulata Hassk., Cat. Hort. Bot. (1844) 76; Miq., Fl. Ind. Bat. 1, 2 (1859) 321; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 295.

Ficus merrittii Merr., Philipp. J. Sci., Bot. 4 (1909) 252; Enum. Philipp. Flow. Pl. 2 (1923) 57; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 303.

Ficus puncticulata Merr., Philipp. J. Sci., Bot. 3 (1908) 313; Enum. Philipp. Flow. Pl. 2 (1923) 93; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 347.

Ficus rigida Jack, Mal. Misc. 2 (1822) 71; Hook., Comp. Bot. Mag. 1 (1836) 222; Merr., J. Arnold Arbor. 33 (1952) 225.

Ficus rupestris Blume, Bijdr. (1825) 439; King, Sp. Ficus 2 (1888) 183.

Ficus sargentii Merr., Philipp. J. Sci. 18 (1921) 63; Enum. Philipp. Flow. Pl. 2 (1923) 64; Sata, Contr. Hort. Inst. Taihoku Imp. Univ. 32 (1944) 274.

Ficus subpanduraeformis de Vriese, Pl. Nov. Hort. Acad. Lugd.-Bat. 1854, Moreae (Ficeae), 1855; Linnaea 10 (1855) 761, non Miq. 1848; possibly *F. cereicarpa* Corner.

Type material of the following names could not be obtained to verify the identity and to make descriptions comparable with the others as in behalf of the construction of keys.

Ficus ilias-paiei Kochummen, Gard. Bull. Singapore 50 (1998) 207, belonging to subg. *Synoecia* sect. *Kissosycea*.

Ficus longistipulata Kochummen, Gard. Bull. Singapore 50 (1998) 208, belonging to subg. *Urostigma* subsect. *Conosycea*.

EXCLUDED NAMES

Covellia composita Miq., Fl. Ind. Bat. 2, 1 (1859) 324; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; King, Sp. Ficus 2 (1888) 120. — Type: *Reinwardt 1515* (holo L; iso U), Celebes = **Poikilospermum suaveolens** (Blume) Merr.

Covellia grandifolia Miq., Fl. Ind. Bat., Suppl (1861) 434; Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 296; King, Sp. Ficus 2 (1888) 120. — Type: *Teijsmann HB 804* (holo L), Sumatra, Bonjol = **Poikilospermum suaveolens** (Blume) Merr.

Ficus inconstantissima Miq., Fl. Ind. Bat., Suppl. (1860) = **Artocarpus dadah** Miq. — see Jarrett, J. Arnold Arbor. 41 (1960) 92.

Ficus peltata Blume, Bijdr. (1825) 438; King, Sp. Ficus 2 (1888) 183 = **Piper sp.** — see Van Steenis, Fl. Males., Ser. 1, 4 (1948) xx.

Ficus ralumensis K. Schum., Notizbl. Bot. Gart. Berlin-Dahlem 2 (1898) 112; Fl. Schutzgeb. Südsee (1901) 282; Diels, Bot. Jahrb. Syst. 67 (1935) 231. — Type: *Warburg 20828* (holo B), Papua New Guinea, Bismarck Archipelago, Ralum, consists of two leaves of *Artocarpus teijsmanii* Miq. and a fig probably of *F. calopilina*. The former element is here designated as the lectotype.

Ficus rowelliana King, Sp. Ficus 1 (1887) 38, t. 43A. — Type: *Forbes 3026* (holo CAL, n.v.), Sumatra, as evident from the plate consisting of a leafy twig of *Dapania racemosa* Korth. (1854), Oxalidaceae, and figs of uncertain identity, probably belonging to a species of subg. *Synoecia* sect. *Kissosycea*; the former element is designated as the lectotype here.

Ficus serpyllifolia Blume, Bijdr. (1825) 443 = **Microchites serpyllifolia** (Blume) Kosterm., Reinwardtia 5 (1860) 245.

Ficus tampang Miq., Fl. Ind. Bat., Suppl. (1860) 425 = **Artocarpus dadah** Miq. — see Jarrett, J. Arnold Arbor. 41 (1960) 92.

Urostigma diepenhorstii Miq., Fl. Ind. Bat., Suppl. (1861) 439. — *Ficus diepenhorstii* (Miq.) King, Ann. Bot. Gard. Calcutta 1 (1888) 181 = **Prainea limpato** (Miq.) Beumée ex Heyne — see Jarrett, J. Arnold Arbor. 40 (1959) 34.