

FLORA MALESIANA PRECURSOR FOR THE TREATMENT OF MORACEAE 7: FICUS SUBGENUS UROSTIGMA

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SUMMARY

The sections and subsections of *Ficus* subg. *Urostigma* are described and their Malesian species listed and keyed out. Two new species are established in the subgenus: *F. kochummeniana* and *F. miqueliana*. The combinations *F. chrysolepis* Miq. subsp. *novoguineensis* (Corner) C.C. Berg and *F. crassiramea* (Miq.) Miq. subsp. *stupenda* (Miq.) C.C. Berg are made. *Ficus subpisocarpa* Gagnep., *F. lawesii* King, and *F. rigo* F.M. Bailey are reinstated.

Key words: Moraceae, *Ficus* subg. *Urostigma*, Malesia.

INTRODUCTION

Subgenus *Urostigma* is with c. 280 species the largest main subdivision of the genus (Berg, 2003). It is pantropical and morphologically distinct by the ability to produce aerial adventitious roots and the presence of a single waxy gland at the base of the midrib of the lamina beneath. The majority of the species are potentially hemi-epiphytic or hemi-epilithic.

The subgenus comprises two subdivisions quite different from the majority. Sect. *Galoglychia* (Gasp.) Endl. is characterised by the structure of the ostiole which is slit-shaped as the two upper ostiolar bracts are descending and by the basal bracts (Berg & Wiebes, 1992). This section, with 72 species, is confined to Africa, Madagascar and adjacent Indian Ocean Islands, and the Arabian Peninsula. The other subdivision is sect. *Stilpnophyllum*, described below. The American subdivision, sect. *Americana* Miq. with c. 100 species, differs from the Old World section *Urostigma* mainly in the presence of only two basal bracts (Miquel, 1847; Corner, 1958).

SUBDIVISIONS AND SPECIES IN MALESIA

Two sections, each with 2 subsections, occur in Malesia.

Ficus subg. **Urostigma** (Gasp.) Miq. (1867) 285 sect. **Urostigma** (Gasp.) Endl. (1848)
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Figs with 3, mostly persistent basal bracts; ostiole circular, the upper ostiolar bracts not descending. *Staminate flowers* scattered among the pistillate ones or concentrated near the ostiole; anthers with 2 thecae. *Stigmas* papillate and cohering.

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).

Ficus subg. **Urostigma** sect. **Urostigma** subsect. **Urostigma** (Gasp.) C.C. Berg, *subsect. nov.*

Based on: *Urostigma* Gasp., Giorn. Bot. Ital. 2 (1844) 214.

Trees, with ± clear morphological indications of intermittent growth, often deciduous. *Leaves* spirally arranged, often articulate or subarticulate; lamina often ovate to sub-ovate; 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 5 are African-Madagascan (Berg & Wiebes, 1992), 4 are Indian, *F. prolixa* G. Forst. is confined to the Pacific region, *F. henneana* Miq. to Australia, and one or two species to the Sino-Himalayan region.

Morphology — The morphological indications of intermittent growth are different colours of parts of twigs of current or recent growth and of previous season's growth, the transition is marked by a section with very short internodes, which in some species bore (bear) stipules forming terminal buds. As these features are also found in the two species included in sect. *Leucogyne*, *F. amplissima* Sm. from India and *F. rumphii*, are included in the subsection, in spite of the deviating colour of the fruit.

Note — *Ficus arnottiana* (Miq.) Miq. (1867) from India and Sri Lanka is transferred from subsect. *Conosycea* in which it was included by Corner (1960: 379) to subsect. *Urostigma*, as defined here. However, var. *subcostata* Corner (1960: 379) proves to belong to subsect. *Conosycea*, being either a form of *F. glaberrima* or a distinct species.

Malesian species recognised in subsect. *Urostigma*: 1) *F. caulocarpa* (Miq.) Miq. (incl. *F. weinlandii* K. Schum. in K. Schum. & Lauterb., 1905, see below); 2) *F. concinna* (Miq.) Miq.; 3) *F. prasincarpa* Elmer; 4) *F. religiosa* L.; 5) *F. rumphii* Blume; 6) *F. saxophila* Blume; 7) *F. subpisocarpa* Gagnep. (reinstated = *F. superba* var. *japonica*); 8) *F. superba* (Miq.) Miq. (excl. var. *henneana* and var. *japonica*, see above); 9) *F. virens* Aiton. — For other synonyms and (included) varieties see Corner's checklist (1965: 6–11).

Ficus subg. **Urostigma** sect. **Urostigma** subsect. **Conosycea** (Miq.) C.C. Berg, *subsect. nov.*

Based on: *Urostigma* Gasp. subg. *Conosycea* Miq., Fl. Ind. Bat. 1, 2 (1859) 349. — *Ficus* subg. *Urostigma* sect. *Conosycea* (Miq.) Corner, Gard. Bull. Singapore 17 (1960) 371.

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 calyprate 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 — This section comprises c. 63 species and ranges from the Pacific and Australia to Madagascar; 53 species occur in Malesia.

Delimitation — This subsection coincides with sect. *Conosycea* as defined by Corner, 1960. Two Madagascan species are included (Berg & Wiebes, 1992).

Subdivision — Three main groups of species can be recognised:

1) *Ficus sunndaica*-group (ser. *Callophylleae*, *Dubiae*, *Glaberrimae*, *Perforatae*, *Subvallidae*, and subser. *Crassirameae* Corner (1960) 373–374), comprising the species numbered: 10, 11, 15, 17, 18, 21, 25, 26, 28, 29, 32, 34, 36, 37, 38, 41, 42, 43, 44, 45, 46, 47, 48, 50, 51, 54(?), 55, 56, 59, 60, 61, 62, and 63. In this group the indumentum is mostly whitish, sometimes yellowish; it is inconspicuous and the leaves are glabrous. The figs are mostly sessile with well-developed basal bracts. The position of *F. glaber-rima* and *F. lawesii* is somewhat uncertain.

2) *Ficus drupacea*-group (subser. *Drupaceae*, *Indicae*, and *Zygostricheae* Corner (1960) 372), comprising the species numbered: 12, 19, 20, 22, 23, 24, 27, 30, 31, 33(?), 35, 39, 52, and 53. This group is characterised by indumentum that is often conspicuously present and brown. The tertiary venation varies from (sub)scalariform to reticulate and is often ± prominent. The figs are pedunculate or sessile; the basal bracts are often small or caducous.

3) *Ficus benjamina*-group (ser. *Benjamineae* Corner (1960) 374), comprising the species numbered: 13, 14, 16, 40, 49, 57, and 58. This group is characterised by tertiary venation distinctly parallel to the lateral veins and often nearly as strong. Indumentum is absent or sparse.

Note — The type of *F. longistipulata* Kochummen (1998: 208) is not found in SAN and has not yet been traced elsewhere, and thus not been examined; hence, its identity is still uncertain.

Malesian species recognised in subsect. *Conosycea*: 10) *F. acamptophylla* (Miq.) Miq. (incl. *F. palungensis* Weiblen (Laman & Weiblen, 1998: 279)); 11) *F. altissima* Blume; 12) *F. annulata* Blume; 13) *F. archboldiana* Summerh.; 14) *F. balete* Merr.; 15) *F. benghalensis* L.; 16) *F. benjamina* L.; 17) *F. binnendijkii* (Miq.) Miq. (incl. *F. ngii* Kochummen, 1998; excl. var. *coriacea* Corner, 1960 and var. *pallescens* Weiblen, 1998); 18) *F. borneensis* Kochummen (incl. *F. chewii* Kochummen, 1998 and *F. kerangasensis* Kochummen, 1998); 19) *F. bracteata* (Miq.) Miq.; 20) *F. calcicola* Corner; 21) *F. callophylla* Blume; 22) *F. chrysolepis* (Miq., a) subsp. *chrysolepis*, b) subsp. *novoguineensis* (Corner) C.C. Berg (= *F. novoguineensis*, see below); 23) *F. consociata* Blume; 24) *F. cordatula* Merr.; 25) *F. corneri* Kochummen, 1998 (incl. *F. lowii* King var. *borneensis* Corner, 1960); 26) *F. crassiramea* (Miq.) Miq., a) subsp. *crassiramea* (incl. *F. ashtonii* Kochummen, 1998, *F. subgelderii* var. *rigida* (Miq.) Corner, 1960, and *F. subsecta* Corner, 1960), b) subsp. *stupenda* (Miq.) C.C. Berg (= *F. stupenda*); 27) *F. cucurbitina* King; 28) *F. curtipes* Corner; 29) *F. delosyce* Corner; 30) *F. depressa* Blume; 31) *F. drupacea* Thunb.; 32) *F. dubia* King; 33) *F. forstenii* Miq.; 34) *F. glaberrima* Blume (excl. var. *bracteata* Corner and synonyms as *F. lawesii*, see below, and var. *siamensis* Corner); 35) *F. globosa* Blume; 36) *F. involucrata* Blume; 37) *F. juglandiformis* King; 38) *F. kerkhovenii* Valetton; 39) *F. kochummeniana* C.C. Berg (= *F. retusa* var. *borneensis* Corner, see below); 40) *F. kurzii* King; 41) *F. lawesii* King (reinstated = *F. glaberrima* var. *bracteata* p.p., see above); 42) *F. lowii* King; 43) *F. maclellandii* King; 44) *F. microcarpa* L.f. (excl. var. *hillei* (Miq.) Corner, var. *saffordii* (Merr.) Corner, and var. *rigo* (F.M. Bailey) Corner, reinstated, see below); 45) *F. microsyce* Ridl.; 46) *F. miqueliana* C.C. Berg (see below); 47) *F. pallescens* (Weiblen) C.C. Berg (= incl. *F. binnendijkii* Miq. var. *coriacea* Corner and var. *pallescens* Weiblen, 1998); 48) *F. paracamptophylla* Corner; 49) *F. patellata* Corner (incl. *F. benjaminoides* Corner); 50) *F. pellucidopunctata* Griff.; 51) *F. pisocarpa* Blume (incl. *F. episima* Corner and *Urostigma tjiela* Miq., see below); 52) *F. pubilimba* Merr.; 53) *F. retusa* L. (excl. var. *borneensis* Corner, see above); 54) *F. rigo* F.M. Bailey (reinstated, see above); 55) *F. soepadmoi* Kochummen, 1998; 56) *F. spathulifolia* Corner; 57) *F. stricta* (Miq.) Miq.; 58) *F. subcordata* Blume (incl. *F. polygramma* Corner); 59) *F. subgelderii* Corner (excl. var. *rigida* (Miq.) Corner, see above); 60) *F. sumatrana* (Miq.) Miq. (incl. *F. dulitensis* Kochummen, 1998 and *F. palaquiiifolia* Corner); 61) *F. sundaica* Blume; 62) *F. tristaniifolia* Corner; 63) *F. xylophylla* (Miq.) Miq. — For other synonyms and (included) varieties see Corner's check-list (1965: 12–24).

Ficus subg. **Urostigma** sect. **Stilpnophyllum** Endl. (1848) 35

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 and not cohering. *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, of which some recently treated by Dixon (2001a, b) and Dixon et al. (2001). 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.

Subdivision — The section comprises two subsections: *Stilpnophyllum* and *Malvanthera*.

Ficus subg. **Urostigma** sect. **Stilpnophyllum** subsect. **Stilpnophyllum** (Endl.) C.C. Berg, *subsect. nov.*

Based on: *Ficus* sect. *Stilpnophyllum* Endl., Gen. Pl. Suppl. 4, 2 (1848) 35.

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; *F. elastica* in the Asian mainland and western Malesia; widely cultivated.

Malesian species recognised in subsect. *Stilpnophyllum*: 65) *F. elastica* Roxb. ex. Hornem.

Ficus subg. **Urostigma** sect. **Stilpnophyllum** subsect. **Malvanthera** (Corner) C.C. Berg, *subsect. nov.*

Based on: *Ficus* subg. *Urostigma* sect. *Malvanthera* Corner, Gard. Bull. Singapore 17 (1960) 374.

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 theca dehiscing longitudinally.

Distribution — Eighteen 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 (Berg, 2002), and two occur both in Malesia and Melanesia.

Malesian species recognised in subsect. *Malvanthera*: 66) *F. brachypoda* (Miq.) Miq.; 67) *F. glandifera* Summerh.; 68) *F. hesperidiiformis* King (incl. *F. augusta* Corner, *F. heteromeka* Corner, *F. mafuluensis* Summerh., *F. sterrocarpa* Diels, and *F. xylosydia* Diels); 69) *F. obliqua* G. Forst.; 70) *F. rhizophoriphylla* King. — For other synonyms and (included) varieties see Corner's check-list (1965: 12–24), and for *F. brachypoda* and *F. obliqua* Dixon (2001b) and Dixon et al. (2001), respectively.

NEW SPECIES, NAMES, AND COMBINATIONS

Ficus chrysolepis Miq. subsp. **novoguineensis** (Corner) C.C. Berg, *comb. & stat. nov.*

Based on: *Ficus novoguineensis* Corner, Gard. Bull. Singapore 18 (1961) 84. — Type: *Henty* NGF 11658 (holo LAE), Papua New Guinea, Lae Botanical Gardens, 4 Jan. 1960.

Ficus crassiramea (Miq.) Miq. subsp. **stupenda** (Miq.) C.C. Berg, *comb. & stat. nov.*

Based on: *Ficus stupenda* Miq., Ann. Mus. Bot. Lugd.-Bat. 3 (1867) 286. — *Urostigma giganteum* Miq., Fl. Ind. Bat. 1, 2 (1859) 351. — Type: *Zollinger 1676* (holo L), Java, base of Mt Salak.

Ficus kochummeniana C.C. Berg, *stat. & nom. nov.*

Based on: *Ficus retusa* L. var. *borneensis* Corner, Gard. Bull. Singapore 17 (1960) 393. — Type: *Hallier 1074* (holo L), Indonesia, Kalimantan, S. Sambas.

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 sub-ovovate 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, subsistent 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; *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 beneath, the ± impressed lateral veins, the often acuminate apex of the lamina, and the often subsistent stipules.

Ficus miqueliana C.C. Berg, *spec. nov.* — Fig. 1

Fico subgelderi similis, lamini glabris, fici receptaculo minore subgloboso, ostiolo inaperto differt. — Typus: *Jacobs 4834* (holo BO; iso K, L, and according to the label also in A and CGE), Indonesia, Java, Besuki, Mt Raung, 18 May 1957.

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

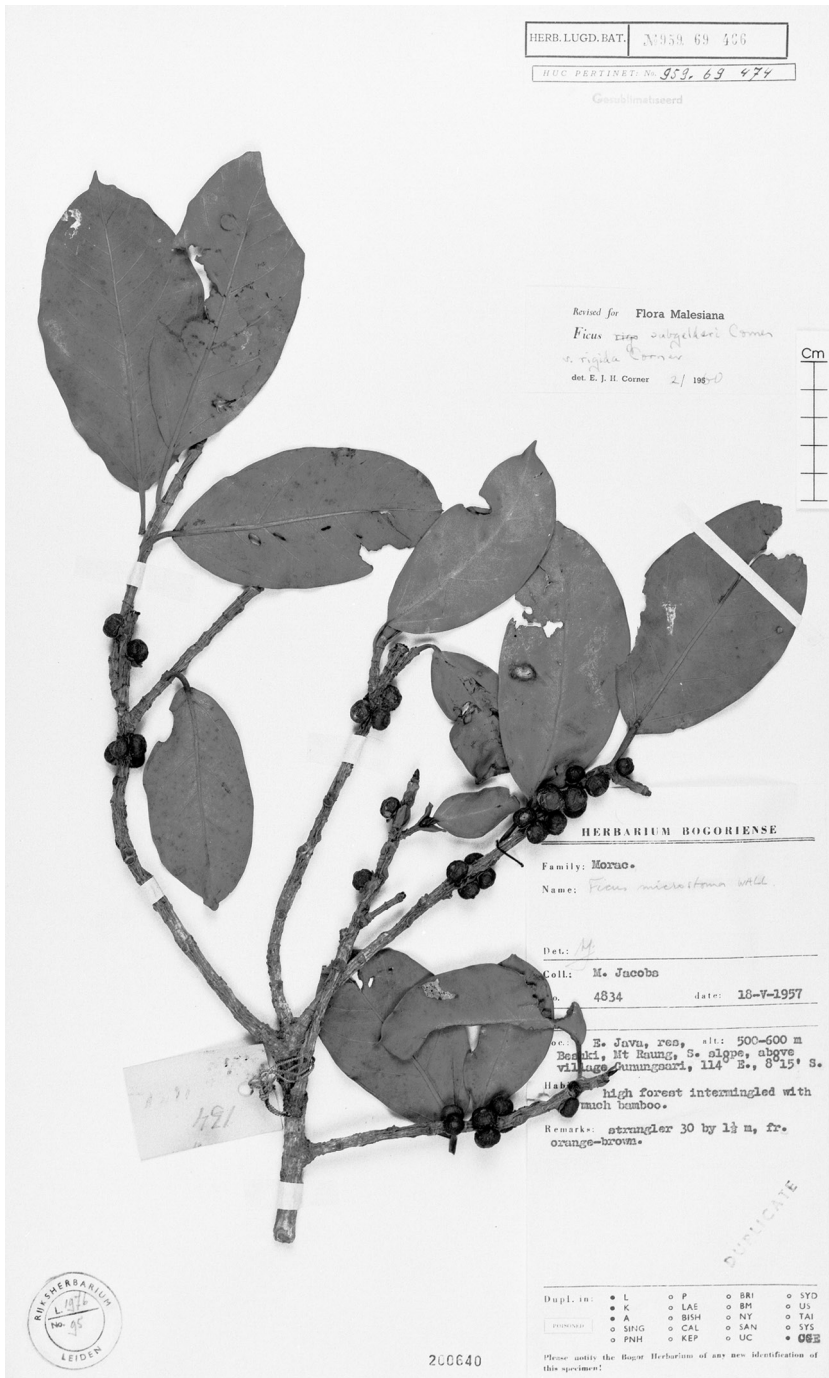


Fig. 1. *Ficus miqueliana* C.C. Berg. Leafy twigs with figs (Jacobs 4834, L), Indonesia, Java, Besuki, Mt Raung, 18 May 1957.

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, \pm 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 \pm shrivelled to almost smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

Distribution — 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 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. The species is known from five collections, all made in a small area in eastern Java.

Ficus pallescens* (Weiblen) C.C. Berg, *stat. nov.

Based on: *Ficus binnendijkii* (Miq.) Miq. var. *pallescens* Weiblen, Trop. Biodiversity 5 (1998) 266.
— Typus: *T. Laman 1195* (holo A n.v.; iso L), Borneo, Kalimantan, Gunung Palung National Park, 10 Oct. 1997.

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 OF SUBSECTION UROSTIGMA

- 1a. Apex of the lamina caudate. — Cultivated, widespread **4. F. religiosa**
 b. Apex of the lamina acuminate, mostly shortly so 2
- 2a. 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) 3
- 3a. Lateral veins 4–7 pairs; margin of upper ostiolar bracts ciliate. — Widespread **6. F. saxophila**
 b. Lateral veins 7–16 pairs; upper ostiolar bracts glabrous (or sparsely puberulous outside) 4
- 4a. Stipules (at the apices of leafy twigs) 0.8–1.5 cm long 5
 b. Stipules (at the apices of leafy twigs) 0.2–0.8 cm long 7
- 5a. 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 6
- 6a. 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**
- 7a. Epidermis of petiole usually flaking off, at least at the top of the petiole and/or 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 8
 b. Epidermis persistent; waxy gland not in a groove at the base of the midrib; basal bracts caducous or remaining entire 9
- 8a. Basal bracts persistent and splitting; fig receptacle 0.3–0.5(–0.7) cm diam. when dry. — Widespread **1. F. caulocarpa**
 b. Basal bracts caducous; fig receptacle 0.7–1.2 cm diam. when dry. — Moluccas **7. F. subpisocarpa**
- 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. — Philippines, Sulawesi, Moluccas **3. F. prasincarpa**
 b. Basal lateral veins up to 1/10–1/5 the length of the lamina, their bases not running parallel to the midrib 10
- 10a. Peduncle 0–0.1 cm long; basal bracts persistent. — Widespread . . . **9. F. virens**
 b. Peduncle 0.1–0.3(–0.5) cm long; basal bracts caducous. — Malay Peninsula, Borneo, Philippines **2. F. concinna**

KEY TO THE SPECIES OF SUBSECTION CONOSYCEA

- 1a. Figs pedunculate or sessile with a peduncle-like stipe 2
 b. Figs sessile 10
- 2a. Figs sessile with a peduncle-like stipe (the basal bracts at the base of the stipe) 3
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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 \pm callose towards the base. — Widespread **21. F. callophylla**
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- 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 35
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- b. Basal bracts 1.5–2 mm long; apex of the lamina usually acuminate to subcaudate. — Sumatra, Malay Peninsula, Borneo **47. F. pallescens**
- 35a. 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**
- 36a. Indumentum of leafy twigs, petioles, and stipules (usually) brownish; basal bracts c. 2 mm long. — Borneo **55. F. soepadmoi**
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- 40a. Basal bracts 2–3 mm long. — New Guinea **54. F. rigo**
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- 41a. Apex of the lamina acuminate, the acumen usually acute; margin of the lamina not callose. — Sumatra, Malay Peninsula, Java, Borneo, Philippines, Sulawesi? **60. F. sumatrana**
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- 43a. Fig receptacle 2–3.5 cm diam. when dry 44
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- 47a. Lateral veins (8–)12–20 pairs; basal lateral veins up to 1/20–1/10 the length of the lamina. — Widespread **12. F. annulata**
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- 53a. 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**
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- 55a. Basal bracts 3–5 mm long; fig receptacle 0.5–1.2 cm diam. when dry. — Sumatra, Borneo **10. F. acamptophylla**
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- 56a. Ostiole \pm 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. subgelderii**
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- 59a. Midrib (and lateral veins) \pm 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**
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- 60a. 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. — Sulawesi, Moluccas, New Guinea **26a. F. crassiramea** subsp. **crassiramea**
- 61a. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 62
 b. Ostiole \pm open, the 3 upper ostiolar bracts not or partly imbricate 63

- 62a. 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**
- 63a. 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 64
- 64a. 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 65
- 65a. Fig receptacle ellipsoid. — Sumatra, Malay Peninsula, Borneo, Philippines **50. F. pellucidopunctata**
- b. Fig receptacle ovoid. — Sumatra, Borneo **10. F. acamptophylla**
- 66a. Fig receptacle 1–2 cm diam. when dry 67
- b. Fig receptacle 0.3–1 cm diam. when dry 78
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- 69a. Basal bracts 0.5–3 mm long 70
- b. Basal bracts (3–)4–10(–18) mm long 72
- 70a. 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 71
- 71a. 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**
- 72a. 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 73
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- b. Midrib of lamina slightly prominent to flat; base of lamina usually cuneate to rounded 74

- 74a. 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 75
- 75a. 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 76
- 76a. 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**
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- b. Lateral veins 10–13 pairs; apex of the lamina (usually) rounded. — Sumatra?, Malay Peninsula **28. F. curtipes**
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- 80a. Lamina ± densely puberulous on the veins beneath. — Malay Peninsula **52. F. pubilimba**
- b. Lamina glabrous beneath 81
- 81a. Stipules glabrous. — Sumatra, Malay Peninsula, Java, Borneo **17. F. binnendijkii**
- b. Stipules yellowish sericeous. — Malay Peninsula **43. F. maclellandii**
- 82a. 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**
- 83a. 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 84
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- 85a. 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**
- 86a. Ostiole ± open, the upper 3 ostiolar bracts not or partly imbricate 87
- b. Ostiole closed, the 3 upper ostiolar bracts clearly imbricate 90
- 87a. Basal lateral veins up to 1/10–1/4 the length of the lamina 88
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- 88a. Fig receptacle 0.3–0.6 cm diam. when dry; basal bracts 1–2 mm long. — Sumatra, Malay Peninsula, Java, Borneo **17. F. binnendijkii**
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- 89a. 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**
- 90a. Lateral veins 10–13 pairs. — Sumatra?, Malay Peninsula **28. F. curtipes**
- b. Lateral veins (3–)4–8(–9) pairs 91
- 91a. Basal bracts 3–5 mm long; apex of the lamina rounded. — Java, Borneo (southern) **53. F. retusa**
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- 92a. 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**

KEY TO THE SPECIES OF SECTION STILPNOPHYLLUM

- 1a. Aperture of the ostiole circular; stipules connate **64. F. elastica**
- b. Aperture of the ostiole slit-shaped or tri-radiate; stipules free 2
- 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**

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