

**TAXONOMY OF FORDIA HEMSLEY
(PAPILIONACEAE: MILLETTIEAE)**

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SUMMARY

The genera *Fordia* Hemsley and *Imbralyx* Geesink are united under *Fordia* for reasons exemplified by Schot (Blumea 36, 1991, 205–234, this issue). *Fordia* (s.s.) was earlier revised by Buijsen (1988). *Imbralyx* was revised by Dasuki (unpublished ms.). A formal treatment of the necessary combinations is presented below.

FORDIA

Fordia Hemsley in Forbes & Hemsley, J. Linn. Soc. 23 (1886) 160; Taub. in E. & P., Nat. Pflanzenfam. 3, 3 (1894) 271; Nachtr. 4 (1914) 137; Dunn, Kew Bull. (1911) 63; Ridley, Fl. Mal. Pen. I (1922) 586; Hutch., Gen. Fl. Pl. I (1964) 378; Whitm., Tree Fl. Malaya I (1972) 293; Geesink in Polhill & Raven, Adv. Legume Syst. (1981) 257; Allen & Allen, Leg. Nod. (1981) 289; Geesink, Leiden Bot. Ser. 8 (1984) 94; Buijsen, Blumea 33 (1988) 239–261. — Type: *Fordia cauliflora* Hemsley.
Imbralyx Geesink, Leiden Bot. Ser. 8 (1984) 95–96. — Type: *Imbralyx albiflorus* (Prain) Geesink.

Trees, treelets, or shrubs. *Leaves* spirally arranged, imparipinnate or simple, petiole pulvinate. Stipules and stipellae persistent or caducous. Petiolules pulvinate. *Leaflets* 1–35, (sub)opposite, (narrowly) elliptic, (narrowly) ovate, or (narrowly) obovate (linear in *F. rheophytica*), terminal leaflet larger than lateral ones; base obtuse to cuneate, sometimes slightly oblique; margin entire; apex acuminate to cuspidate; very sparsely hairy, or only hairy on the nervation, or glabrous on upper surface; glabrous to sericeous on lower surface. Midrib raised beneath and either raised, or flat, or sunken, or raised in a furrow above. Secondary nerves alternating, with marginal arches, prominent beneath, prominent to flat above; tertiary arches indistinct. Intersecondary nerves distinct or indistinct. Venation reticulate, usually distinct. Pseudoracemes, panicles, or intermediate forms terminal, (supra)axillary, ramiflorous, and/or caulinascent, or brachyblasts inserted directly on trunk or branches (in *F. pauciflora*). Brachyblasts wartlike, or thick to slender cylindrical; the lower placed often more elongated; flowerbuds 2–21. Bracts to the brachyblasts (narrowly) triangular, mostly caducous. Bracts to the flowers triangular or (broadly) ovate, caducous. Bracteoles 2, elliptic to (broadly) ovate, usually on top of the pedicel, sometimes with 2 latex ducts, sericeous, caducous (persistent in *F. bracteolata*). *Flowers* papilionate, up to 20 mm long, pedicelled. Calyx campanulate, obscurely lobed or distinctly toothed with the upper one two-topped, imbricate in bud; outside

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sericeous; inside glabrous; latex ducts absent or present. Standard blade about orbicular, reflexed at base; basal callosities and laminal auricles present or absent; outside sericeous or glabrous, inside glabrous. Wing blades free, spatulate to (sub)falcate, equal to or slightly longer than the keel; upper auricle distinct, lower auricle slightly to distinctly developed or absent; sometimes base and apex hairy outside; lateral furrow distinct. Keel blades (sub)falcate, partly connate along lower margin from half-way to (just) beneath the apex; upper auricle present; sometimes base and apex hairy outside; lateral pockets usually distinct. *Stamens* monadelphous; filaments alternately long and short, gradually longer on the lower side; basal fenestrae distinct. Anthers uniform. Disc inconspicuous or sometimes free or adnate to the wall of the hypanthium, annular. Ovary sericeous, linear, laterally flattened. Style curved upwards, glabrous or hairy at base. Stigma capitate, glabrous. Ovules 2–7. *Pod* (sub)falcate or sometimes elliptic, tardily dehiscent, thin woody, sparsely hairy to soft velvety, flat with thickened margin, sometimes slightly convex around seeds, unwinged, apex beaked. *Seeds* lens-shaped to elliptic or reniform, transversely elliptic or (sub)quadrate, laterally flattened to convex, smooth.

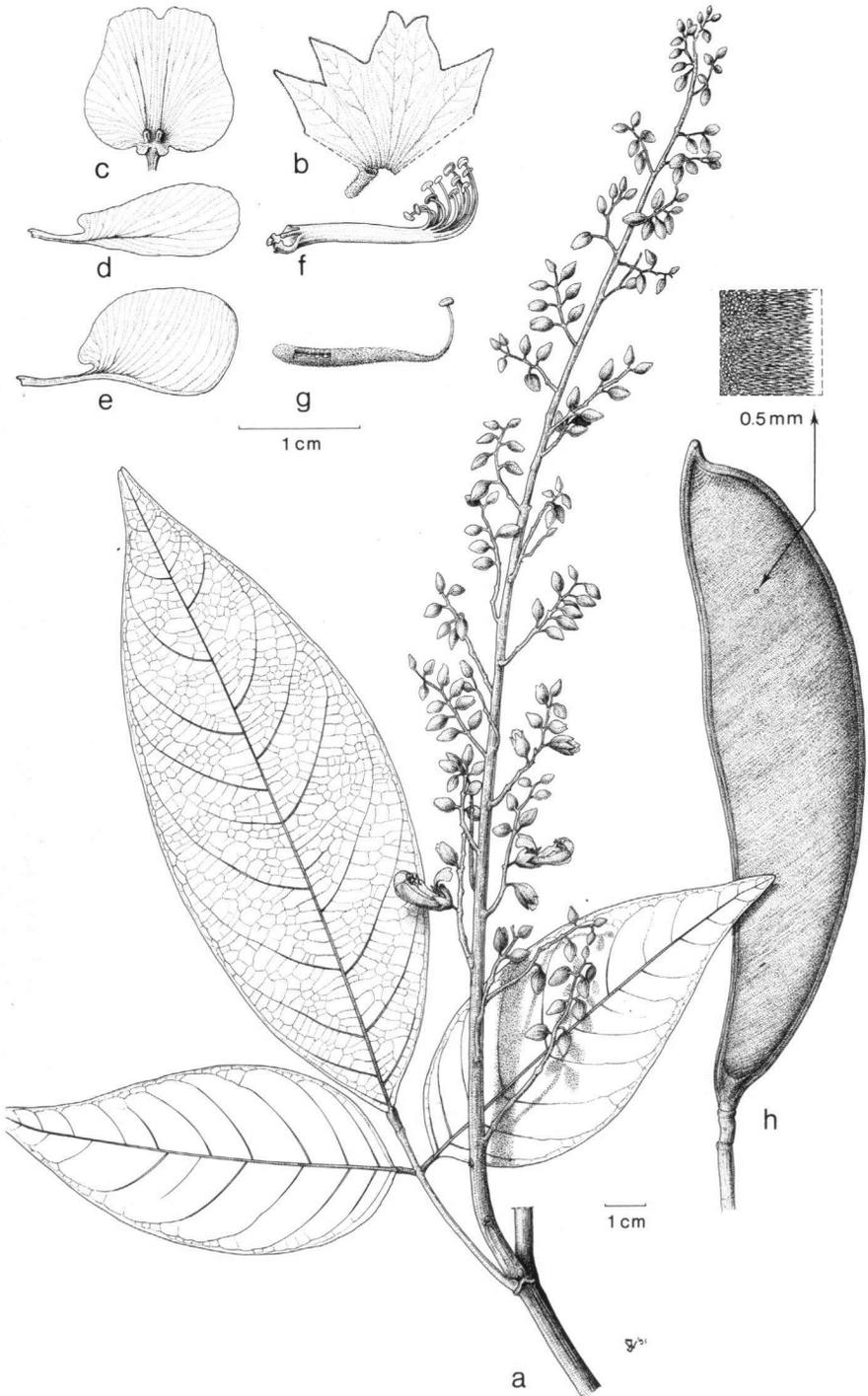
Distribution – South China, Peninsular Thailand, Malaya, Sumatra, Borneo, Anambas Islands and the Sulu Archipelago (Phillippines).

KEY TO THE SPECIES

- 1a. Stipellae persistent (can be minute) 2
- b. Stipellae caducous 4
- 2a. Leaflets 9–19 with scattered hairs beneath; stipules absent, or if present 2–10 mm long, triangular 3
- b. Leaflets 23–25, sericeous beneath; stipules 2 mm long, narrowly triangular, persistent. – Inflorescences caulinascent, China **4. F. cauliflora**
- 3a. Leaflets 9–11, the lower placed orbicular to elliptic, apex caudate; midrib sunken to flat above; stipellae 2–7 mm long; brachyblasts directly on trunk or branches **12. F. pauciflora**
- b. Leaflets 9–19, all (narrowly) elliptic, apex acuminate to cuspidate; midrib raised above; stipellae 1–2 mm long; (supra)axillary to raminascent pseudoracemes **7. F. lanceolata**
- 4a. Flowers or fruits in panicles, pseudoracemes, or intermediate inflorescences 5
- b. Flowers or fruits clustered on woody brachyblasts directly on trunk or branches **12. F. pauciflora**
- 5a. Calyx subtruncate, or obscurely lobed, then teeth not longer than 1 mm, not imbricate; pods very sparsely hairy 6
- b. Calyx distinctly lobed, teeth 1.5–6 mm long, lobes in buds imbricate, pods velvety 12
- 6a. Leaflets (1–)3–17; midrib raised, or flat to raised in a furrow; lower surface leaflets sericeous or glabrous 7
- b. Leaflets 17–35; midrib sunken; lower surface leaflets with scattered short to long hairs **11. F. ophirensis**
- 7a. Stipules linear to narrowly triangular, not longer than 7 mm, or stipules caducous 8

- b. Stipules mostly persistent, distinct, narrowly triangular, longer than 10 mm
15. F. stipularis
- 8a. Lower surface leaflets sparsely to densely sericeous, sometimes with golden or silver gloss, nervation flat above, midrib flat to raised in a furrow; leaflets (linear) elliptic to (linear) ovate, tip 4–6 times shorter than lamina 9
- b. Lower surface leaflets glabrous, nervation and midrib raised above; leaflets elliptic to ovate with tip 1.5–3 times shorter than lamina **6. F. johorensis***
- 9a. Leaflets (narrowly) elliptic to (narrowly) ovate, apex acuminate to caudate, tip distinct 10
- b. Leaflets linear elliptic to linear ovate, leaf index of at least some leaflets 6 or more, apex acute, tip indistinct. – Rheophyte **13. F. rheophytica**
- 10a. Leaves compound, leaflets (narrowly) elliptic to (narrowly) ovate, if some simple, then rachis still present 11
- b. Leaves all simple, narrowly elliptic, rachis absent **18. F. spec. b**
- 11a. Inflorescence a pseudoraceme, the brachyblasts short and wartlike to thick and cylindric, sometimes lower brachyblasts elongated, but distinct and not resembling a shortened branch of a panicle with loosely packed flowers; bract to the brachyblast small, red brown hairy, mostly persistent, in some even persistent in fruiting specimens, straight; nervation curving; leaflets (5–)7–17(–27)
14. F. splendidissima
- b. Inflorescence a panicle, intermediate form, or pseudoraceme but then the brachyblasts very small, indistinct, or slenderly elongated, still recognizable as a shortened branch with an axis and scars of the individual loosely packed flowers; bract to the brachyblast caducous, sometimes present around very young brachyblasts, then arched and half enclosing brachyblast and buds; nervation curving only towards the margin; leaflets (1–)3–7(–9) . **2. F. brachybotrys**
- 12a. Leaflets 13–17; inflorescences raminascent, clustered on warty knobs on trunk or branches; secondary nerves almost flat above 13
- b. Leaflets 1–9(–13); inflorescence axillary or terminal, if raminascent then not clustered on a warty knob; secondary nerves distinctly raised above 14
- 13a. Lateral leaflets 8.5–27 cm long; brachyblasts up to 6 mm long, bearing up to 11 flowers **5. F. incredibilis**
- b. Lateral leaflets 10–15 cm long; brachyblasts up to 10 mm long, bearing up to 21 flowers **17. F. spec. a**
- 14a. Stipules caducous; leaflets glabrous or sparsely hairy but then hairs dark orange brown coloured 15
- b. Stipules present, triangular, c. 3 mm long, densely yellowish hairy; leaflets with at least scattered white/silvery hairs on nerves above and with scattered white/silvery hairs on lower surface. – China **8. F. leptobotrys**
- 15a. Leaflets thin, papery; apex cuspidate to caudate, tip distinct; brachyblasts wartlike or short-cylindric; calyx teeth obtuse, 1.5–3 mm long, about half as long as the calyx cup 16

*) *Fordia johorensis* is also characterized by its long recurved brachyblasts, but this is neither exclusive nor constant: specimens *Axelius* 254 and *S* 41927 have long and recurved lower brachyblasts and specimen *SF* 37065 (type!) has young and not yet recurved brachyblasts.



- b. Leaflets thick or leathery; apex acuminate to cuspidate, tip indistinct; brachyblasts slenderly elongated to long-cylindric or inflorescence a panicle; calyx teeth acute, 3–6 mm long, about as long as the calyx cup 17
- 16a. Leaflets 5–15 cm long, elliptic to ovate; mature flowers 12–14 mm; pods shortly and stiffly velvety, margins very slightly thickened; Malaya . . . 9. *F. ngii*
- b. Leaflets 7–19 cm long, (narrowly) elliptic; flowers 18–20 mm; pods brown, soft, shiny velvety, margins distinctly thickened; Sumatra 10. *F. nivea*
- 17a. Leaflets (1–)3–7, if one then rachis still present 18
- b. Leaves simple, rachis absent 16. *F. unifoliata*
- 18a. Bracteoles narrowly triangular, 1.5 mm long, caducous 1. *F. albiflora*
- b. Bracteoles ovate, 6.5 mm long, persistent 3. *F. bracteolata*

1. *Fordia albiflora* (Prain) Dasuki & Schot, *comb. nov.* – Fig. 1.

Millettia albiflora Prain, J. As. Soc. Beng. 66, II (1897) 92, 364; Ann. Calc. Bot. Gard. 9, 1 (1901) 24, t. 31; Dunn, J. Linn. Soc. 41 (1912) 190; Ridley, Fl. Mal. Pen. I (1922) 584; Whitm., Tree Fl. Malaya I (1972) 296. — *Imbralyx albiflorus* (Prain) Geesink, Leiden Bot. Ser. 8 (1984) 95. — Lectotype (newly indicated): *King's coll. 6077* (iso L), Malaya, Perak, Larut.

Stipules caducous. Leaf rachis (2–)5–7(–22) cm long, 1–2 mm in diameter, glabrous. Pulvinus 3.5–7.7 by 2–3.8 mm. Stipellae absent. Petiolules 4–7 mm long, 1–2 mm in diameter. *Leaflets* (1–)3–7, (narrowly) ovate to (narrowly) elliptic to (narrowly) obovate (mainly the terminal one), thick; the terminal one 12–28 by 3–9 cm, the lateral ones 8–20 by 2–7 cm; base cuneate, sometimes slightly oblique; apex acuminate to caudate. Young leaflet sparsely hairy, hairs dark orange brown, old leaflets glabrescent (see note 3). Nervation sparsely hairy, glabrescent. Midrib raised above. Secondary nerves 6–11 pairs, raised above. Intersecondary nerves distinct. Venation reticulate, distinct. *Inflorescence* a terminal or axillary panicle, or an axillary pseudoraceme, rachis 20–45 cm long. The pseudoracemes with the lower placed brachyblasts slenderly elongated up to 18 mm long bearing up to 10 flowers, the higher brachyblasts shorter. Pedicel 3–4 mm long. Bracts elliptic to ovate, 1–2 by 1 mm. Bracteoles narrowly triangular, 1.5 by 0.5–1 mm, caducous. *Flower* 16–18 mm long. Latex ducts absent. Calyx imbricate, spindle-shaped, cup 4–5 by 3.5–5 mm, teeth 4, acute, 3–5 mm long, the upper two-topped. Petals glabrous. Standard with distinct lateral auricles and basal callosities, blade orbicular, 11–12 by 10–11 mm, claw 3–4 mm long. Wing auricled on both sides, blade slightly obovate, 11–12 by 5–6 mm, claw 4–5 mm long. Keel with lateral pockets distinct, blade obovate, 11–12 by 7 mm, claw 4–5 mm long. Ovary 9–11 mm long. Ovules 2–7. Disc distinct, adnate. *Pod* falcate, 14–23 by 3.5–5 cm, margins thickened, beaked, velvety. *Seeds* slightly elliptic to orbicular, 20–23 by 16–17 mm.

Field notes – Tree, 6–30 m. Girth 10–90 cm. Bark smooth, grey or grey brown with small lenticels. Slash inner wood cream or pale yellow, laminated. Leaves glossy dark green. Flowers white, light brown underneath. Buds dark glossy brown, velvety. Fruits glossy velvety black.

Fig. 1. *Fordia albiflora* (Prain) Dasuki & Schot. a. Habit; b. calyx; c. standard inside; d. wing petal; e. keel petal; f. stamens; g. ovary; h. pod ((a–g): *King's Coll. 5357*; h: *KLU 9053*).

Distribution — Central and South Malaya (Perak to Terengganu to Johore).

Habitat & Ecology — Lowland forest, disturbed forest, limestone forest, usually riversides. Altitude 30–244 m. Flowering time: March to May; fruiting time: March to November.

Vernacular names — Kayu pelawan (Tenuan), pokok rinyu (Malaya), urat rusa, kayu rindu.

Notes — 1. Specimen *KEP-FRI 7994* (K), collected by Cockburn at Labis F. R., mentioned by Whitmore (l.c.: 299) as *Millettia* sp. B, has unifoliolate leaves. From its leaf and fruit characters, however, it is recognized to belong to *F. albiflora*.

2. Young leaflets of *F. albiflora* are very sparsely hairy, mostly along the midrib on the lower surface. The glabrous older leaflets (or those from old collections) preserve still the basal cells of the hairs, but these can only be seen on microscopic preparates.

2. *Fordia brachybotrys* Merr.

Fordia brachybotrys Merr., Philipp. J. Sc. 30 (1926) 397; Buijsen, Blumea 33 (1988) 250.

3. *Fordia bracteolata* Dasuki & Schot, *spec. nov.*

Ab *Fordia albiflora* in bracteolis majoribus persistentibus differt. — Typus: *KEP-FRI 2991* (*Kochunmen*) (L; iso KEP, n.v., U), Peninsular Malaya, Selangor, Ampang F. R.

Stipules caducous. Leaf rachis 11–15 cm long, c. 2 mm in diameter, glabrous; pulvinus 5.5 by 2.5–3.7 mm. Stipellae absent. Petiolules c. 5.7 mm long. Leaflets 3–7, narrowly elliptic to narrowly obovate, thick; the terminal one 20–21.5 by 5.5 cm, the lateral ones 11–15 by 3–4 cm; base cuneate; apex acuminate to cuspidate. Young leaflets sparsely hairy, hairs dark orange brown, old leaflets glabrescent (see note 2 under *F. albiflora*). Nervation sparsely hairy, glabrescent. Midrib raised above. Secondary nerves 8–10 pairs, raised above. Intersecondary nerves distinct. Venation distinct, reticulate. Inflorescence a terminal or axillary panicle, rachis up to 30 cm long. Pedicels 3.6–4 mm long. Bracts ovate, 3 by 1.5 mm, caducous. Bracteoles ovate, 6.5 by 4.5 mm, persistent (sometimes even in mature flowers). Flower c. 18 mm long. Latex ducts absent. Calyx imbricate, spindle-shaped, cup 4 by 4 mm, teeth acute, the upper two-topped, 6 mm long. Petals glabrous. Standard with distinct lateral auricles and basal callosities, blade orbicular, 14 by 11 mm, claw 3 mm long. Wing auricled on both sides, blade obovate, 14 by 6 mm, claw 4 mm long. Keel with distinct lateral pocket, blade obovate, 13 by 8 mm, claw 5 mm long. Ovary 8–9 mm long. Ovules 5–7. Disc distinct, adnate. Pod recorded 14–15 by 2.5 cm, velvety. Seeds not seen.

Field notes — Tree, 12 m high, 14 cm in diameter. Crown dense and spreading. Bole with multiple stems. Bark smooth, grey, slash inner bark brown with colorless watersap. Slash wood pale pink. Flowers white, flowering profusely. Common (but this refers probably to *F. albiflora*).

Distribution — Central Malaya (Perak, Selangor).

Habitat & Ecology — Road side, lowland. Flowering time: March; fruiting time not known.

Vernacular names – Kayu rindu, krat rusa.

Notes – 1. Very similar to *F. albiflora*, differs by larger and persistent bracteoles. As this character is only observed in flowering specimens, it is possible that some of the fruiting specimens of *F. albiflora* also belong to the present species. A striking fact is that all specimens of *F. albiflora* until now found in Selangor are in fruit. In anatomical aspect *F. bracteolata* differs clearest from *F. albiflora* in the presence of birefringent granules in the epidermis, but this character shows intraspecific variation in some other species (e.g. *F. leptobotrys*).

2. The pod has only been fragmentarily collected by Ridley in Petaling, Selangor (Ridley 8598). The measures were taken from the annotation of Ridley on this sheath, which contains two fragments from which was observed that the pods are velvety.

4. *Fordia cauliflora* Hemsley

Fordia cauliflora Hemsley in Forbes & Hemsley, J. Linn. Soc. 23 (1886) 160, t. 4; Buijsen, Blumea 33 (1988) 251.

5. *Fordia incredibilis* Whitm.

Fordia incredibilis Whitm., Fed. Mus. J. 13 (1970) 136; Tree Fl. Malaya I (1972) 293. — *Imbralyx spec. nov. a.*, Buijsen, Blumea 33 (1988) 259. — Type: KEP-FRI 8712 (SING; iso K, L, S), Malaya, Johore, NW slopes of G. Belumut.

Stipules caducous. Leaf rachis 39–70 cm long, 1.5–3 mm in diameter, glabrous. Pulvinus large, 6.1–15.3 by 4.2–10 mm. Stipellae absent. Petiolules 4–9 mm long. *Leaflets* 13–17, narrowly elliptic to narrowly obovate; the terminal one 22.5–26 by 5–7.3 cm, the lateral ones 8.5–27 by 2.3–5.5 cm; base cuneate, sometimes slightly oblique, apex cuspidate; glabrescent above (see note 2 under *F. albiflora*), sparsely hairy beneath, hairs dark orange brown. Nervation sparsely hairy, glabrescent above. Midrib raised above. Secondary nerves 6–8 pairs, almost flat above. Intersecondary nerves distinct. Venation distinct, reticulate. *Inflorescence* a caulinascent pseudoraceme clustered on warty knobs on trunk, rachis 18–40 cm long. Brachyblasts cylindric up to 6 mm long, bearing up to 11 flowers. Pedicels 2 mm long. Bracts narrowly ovate, 2–3 by 1 mm. Bracteoles ovate, 1 by 0.5 mm, caducous. *Flower* 14–15 mm long. Latex ducts absent. Calyx imbricate, spindle-shaped, cup 3.5–4 by 5–5.5 mm, teeth obtuse, 1.5–2 mm long, the upper one two-topped. Petals glabrous. Standard with small lateral auricles, blade orbicular, 11–12 by 10–11 mm, claw 3–4 mm long. Wing blade falcate, 10–11 by 4 mm, claw 4 mm long. Keel with lateral pocket, blade obovate, 10–11 by 7 mm, claw 4–4.5 mm long. Ovary 9 mm long. Ovules 4 or 5. Disc distinct. *Pod* falcate, 10–14 by 1.7–2.7 cm, margins thickened, beaked, velvety. No ripe seeds observed.

Field notes – Slender tree, 6–7 m high, c. 30 cm in diameter. Crown sparsely branched. Flowers pink, racemes clustered on small knobs on the trunk, short side branches of raceme bearing flowers rather fleshy and pink. Fruits on spikes from upper bole below crown, pods velvety dark brown.

Distribution – South Malaya (Johore).

Habitat & Ecology — Forest, from low altitude up to 244 m. Flowering time: May; fruiting time: May.

Note — *KEP-FRI 7798* differs from this group in its shorter leaf rachis, smaller leaflets, longer brachyblasts with more densely packed flowers and the higher placed disk which is adnate to the hypanthium. See *Fordia spec. a.*

6. *Fordia johorensis* Whitm.

Fordia johorensis Whitm., Gard. Bull. Sing. 24 (1969) 4; Buijzen, Blumea 33 (1988) 251.

7. *Fordia lanceolata* Ridley

Fordia lanceolata Ridley, Fl. Mal. Pen. 5 (1925) 304; Buijzen, Blumea 33 (1988) 253.

8. *Fordia leptobotrys* (Dunn) Schot, Dasuki & Buijzen, *comb. nov.*

Millettia leptobotrya Dunn, J. Linn. Soc. 41 (1912) 189. — Lectotype (newly indicated): *Henry 12792* (K), China, Yunnan, Szemao.

Stipules triangular, 3 mm long, densely yellowish hairy. Leaf rachis 18–24 cm long, 1.2–2 mm in diameter, sparsely hairy. Pulvinus 5–5.3 by 2–2.2 mm. Stipellae absent. Petiolules 3.4–7 by 0.5–1.5 mm. Leaflets 7–9, narrowly elliptic, papery; the terminal one 14.5–22 by 3.5–5.5 cm, the lateral ones 6–20 by 2.5–4 cm; base obtuse to slightly oblique, apex cuspidate to caudate; sparsely hairy on both sides, hairs silvery. Nervation sparsely hairy on both sides. Midrib raised above. Secondary nerves 6–11 pairs, raised above. Intersecondary nerves distinct. Venation distinct, reticulate. Inflorescence a terminal or axillary slender pseudoraceme, rachis 35–42 cm long. Brachyblasts cylindrical up to 11 mm long bearing c. 10 flowers. Pedicel c. 2 mm long. Bracts ovate, 2 by 1 mm. Bracteoles ovate, c. 1 by 0.5 mm, caducous. Flower 11–13 mm long. Latex ducts absent. Calyx imbricate, spindle-shaped, cup c. 3 by 3.4–4 mm, teeth obtuse, 1.5–2 mm long, the upper two-topped. Petals glabrous. Standard with small basal auricles, blade orbicular, 9 by 8 mm, claw 2–3 mm long. Wing auricled on both sides, blade obovate, 9 by 4 mm, claw 2–3 mm long. Keel with lateral pocket, blade obovate, 9 by 5 mm, claw 2–3 mm long. Ovary c. 7 mm long. Ovules 4 or 5. Disc indistinct. Pod obovate, 15–17 by 3–3.5 cm, margins thickened, beaked, velvety (sparsely hairy when old). Seeds reniform, c. 17 by 13 mm.

Field notes — Tree, 6–9 m. Flowers white.

Distribution — South China (Yunnan).

Habitat & Ecology — Forest, altitude 700–1220 m, on slopes. Flowering and fruiting time not known.

Note — Dunn (l.c.: 190) mentioned that the disk is adnate to the wall of the hypanthium with a crenulate apex, but we did not observe this feature.

9. *Fordia ngii* Whitm.

Fordia ngii Whitm., Gard. Bull. Sing. 24 (1969) 5; Tree Fl. Malaya I (1972) 294. — *Imbralyx spec. nov. b.*, Buijsen, Blumea 33 (1988) 259. — Type: SF 32042 (SING; iso K, L), Malaya, Johore, Sungai Kayu.

Stipules caducous. Leaf rachis 4.5–12.5 cm long, 0.6–1 mm in diameter, sparsely hairy. Pulvinus 3.6–6.3 by 1.7–2.0 mm. Stipellae absent. Petiolules 3–6 mm long. *Leaflets* 3–5(–13), elliptic to obovate, papery; the terminal one 9–15 by 4–5.8 cm, the lateral ones 5–12 by 2–6 cm; base cuneate to obtuse, sometimes slightly oblique, apex cuspidate; sparsely hairy on both surfaces, hairs dark orange brown, glabrescent above (note 2 under *F. albiflora*). Nervation sparsely hairy, glabrescent above. Midrib raised above. Secondary nerves 4–7 pairs, raised above. Inter-secondary nerves distinct. Venation distinct, reticulate. *Inflorescence* an axillary or raminascent pseudoraceme, rachis 9–13 cm long. Brachyblasts wartlike, 5–7 mm long bearing 4–8 flowers. Pedicel 2–4 mm long. Bracts ovate, 1–1.5 by 0.5–1 mm. Bracteoles ovate, 1 by 0.5–0.8 mm. *Flower* 12–14 mm long. Latex ducts absent. Calyx imbricate, spindle-shaped, cup 4–5 by 3.5–4 mm, teeth obtuse, 2.5–3 mm long, the upper two-topped. Petals glabrous. Standard with small lateral auricles, blade orbicular, 11 by 9 mm, claw 3 mm long. Wing auricled on both sides, blade obovate, 11 by 3.5 mm, claw 4 mm long. Keel blade obovate, 11 by 3 mm, claw 5 mm long. Ovary c. 10 mm long. Ovules 2. Disc distinct. *Pod* elliptic, 9.5–10.5 by 2.9–3.1 cm, margins very slightly thickened, beaked, shortly stiffly velvety. Seeds not seen.

Field notes – Small tree, 4–6 m high, diameter 45 cm. Trunk, bark greyish white, smooth. Leaves citrus-green shiny on both surfaces. Flowers white in spikes on the twigs. Pods yellowish golden silky.

Distribution – Central and South Malaya (Pahang, Johore).

Habitat & Ecology – Disturbed secondary forest, hill near swamp, track slide, altitude low, basaltic soil. Flowering time: March, October; fruiting time: August.

Notes – 1. Whitmore (l.c. 1972: 294) mentioned that the keel is sometimes absent. The flowers which we saw all had a keel.

2. The specimen *KEP-FRI 99069* (K, L), mentioned by Whitmore (l.c. 1972: 294) and seen by Buijsen (pers. comm.) was not found (!).

10. *Fordia nivea* (Dunn) Dasuki & Schot, *comb. nov.* – Fig. 2.

Millettia nivea Dunn, J. Linn. Soc. 41 (1912) 189. — Type: *Forbes 2916* (K), Sumatra, River Rupit.

Stipules caducous. Leaf rachis 10–28 cm long, 1–1.7 mm in diameter, glabrous. Pulvinus 4.5–7 by 2–3 mm. Stipellae absent. Petiolules 3–7.3 mm long. *Leaflets* 7–11, (narrowly) elliptic to (narrowly) obovate, papery; the terminal one 10.5–19.5 by 3–5.7 cm, the lateral ones 5–17.2 by 2.2–5.5 cm; base obtuse to cuneate, sometimes slightly oblique, apex cuspidate to caudate; very sparsely hairy beneath (seen only under a magnification of at least $\times 20$), hairs dark orange brown, glabrescent

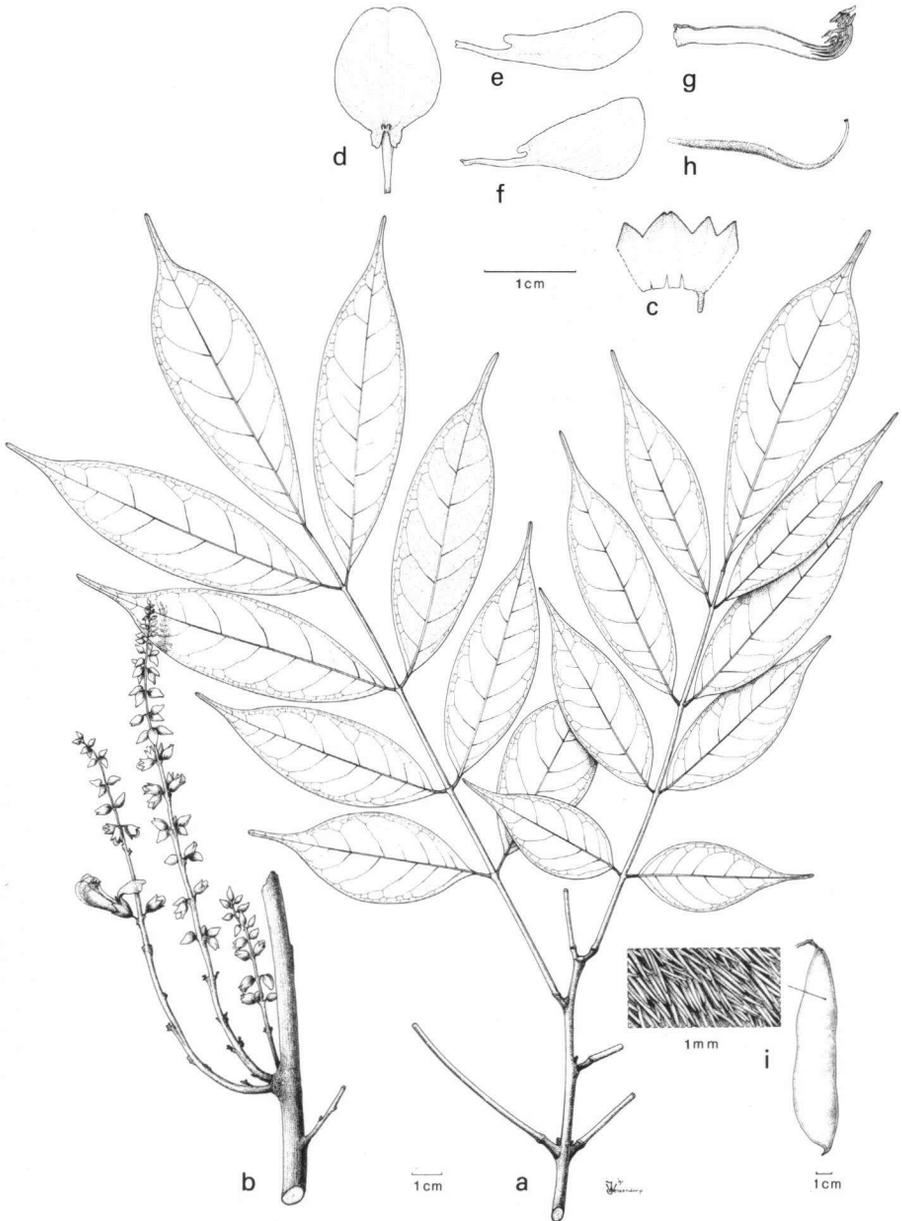


Fig. 2. *Fordia nivea* (Dunn) Dasuki & Schot. a. Habit; b. inflorescence; c. calyx; d. standard inside; e. wing petal; f. keel petal; g. stamens; h. ovary; i. pod ((a–h: TBF 1431; i: NGS 1684).

above (note 2 under *F. albiflora*). Nervation sparsely hairy. Midrib raised above. Secondary nerves 6–9 pairs, raised above. Intersecondary nerves distinct. Venation distinct, reticulate. Inflorescence an axillary or raminascent pseudoraceme, rachis 3.5–20.5 cm long. Brachyblasts wartlike, up to 7 mm long, bearing up to 6 flowers. Pedicel 2–3 mm long. Bracts ovate, 0.8–1.5 by 0.5 mm. Bracteoles ovate, 0.5–0.8 by 0.4–0.5 mm. Flower 18–20 mm long. Latex ducts absent. Calyx imbricate, spindle-shaped, cup 4–5 by 4.5–5.5 mm, teeth obtuse, 1.5–2 mm long, the upper one two-topped. Petals glabrous. Standard with small lateral auricles, blade orbicular, 14–15 by 11–12 mm, claw 4–5 mm long. Wing blade obovate, 14–15 by 5–7 mm, claw 4–5 mm long. Keel blade obovate, 13–15 by 7–9 mm, claw 4–5 mm long. Ovary c. 10 mm long. Ovules 3 or 4. Disc distinct, free. *Pod* falcate, c. 15 by 2.5–3.5 cm, margins thickened, beaked, soft, shiny velvety. Seeds not seen.

Field notes – Small tree, 5–14 m high, 5–21 cm in diameter, densely branched. Flowers white. Pod brown.

Distribution – Sumatra (Jambi, Riau).

Habitat & Ecology – Primary forest, hillslope, dryland, altitude 30–200 m. Flowering time: March; fruiting time: November.

Vernacular name – Bohal.

Note – Dunn (l.c.: 189) erroneously mentioned that bracts, bracteoles, and disk are absent, but in his original material these are distinct.

11. *Fordia ophirensis* Ridley

Fordia ophirensis Ridley, Fl. Mal. Pen. 5 (1925) 304; Buijsen, Blumea 33 (1988) 254.

12. *Fordia pauciflora* Dunn

Fordia pauciflora Dunn, J. Linn. Soc. 41 (1912) 237; Buijsen, Blumea 33 (1988) 254.

13. *Fordia rheophytica* (Buijsen) Dasuki & Schot, *comb. nov.*

Fordia splendidissima subsp. *rheophytica* Buijsen, Blumea 33 (1988) 258.

14. *Fordia splendidissima* (Blume ex Miq.) Buijsen

Fordia splendidissima Buijsen, Blumea 33 (1988) 255.

Note – New material has not made relations within this very heterogeneous species clearer. A cladistic analysis including *F. brachybotrys*, *F. rheophytica*, *F. stipularis*, *F. spec. b.*, and all extremes of *F. splendidissima* might shed some light. However, as this is not yet done, I will keep the present species delimitation.

15. *Fordia stipularis* (Prain) Dunn

Fordia stipularis (Prain) Dunn, Kew Bull. (1911) 64; Buijsen, Blumea 33 (1988) 258.

16. *Fordia unifoliata* (Prain) Dasuki & Schot, *comb. nov.*

Millettia unifoliata Prain, J. As. Soc. Beng. 66, 2 (1897) 93, 364; Ann. Calc. Bot. Gard. 9, 1 (1901) 23, t. 30; Dunn, J. Linn. Soc. 41 (1912) 190; Ridley, Fl. Mal. Pen. 1 (1922) 584; Whitm., Tree Fl. Malaya 1 (1972) 298. — Lectotype (newly indicated): *Ridley 8004* (K) Malaya, Perak, Dindings.

Stipules caducous. Leaf rachis and pulvinus absent. Petiole completely pulvinate, 3–6 by 1.5–2.5 mm. *Leaves* simple, narrowly elliptic to narrowly obovate, shiny, leathery, 8–19 by 3.2–6.8 cm; base cuneate, apex acuminate to cuspidate; glabrous on both sides. Nervation glabrous on both sides. Midrib raised above. Secondary nerves 8–11 pairs, raised above. Intersecondary nerves distinct. Venation distinct, reticulate. *Inflorescence* a terminal or axillary pseudoraceme, rachis 4–15 cm long. Brachyblasts elongated, cylindric, the lower placed ones up to 10 mm long bearing up to 6 flowers. Pedicel 2–3.5 mm long. Bracts ovate, 1 by 0.5 mm. Bracteoles ovate, 1 by 0.5 mm, caducous. *Flower* 14–19 mm long. Latex ducts absent. Calyx imbricate, spindle-shaped, cup 4–5 by 4–6 mm, teeth acute, 3–4 mm long, the upper one two-topped. Petals glabrous. Standard with basal callosities and distinct lateral auricles, blade orbicular, 11–13 by 11–12 mm, claw 3–4 mm long. Wing blade obovate, 11–14 by 6.5–7 mm, claw 5–6 mm long. Keel with lateral pocket, blade obovate, 11–13 by 7–10 mm, claw 5–7 mm long. Ovary 9–10 mm long. Ovules 3–7. Disc distinct, adnate. *Pod* falcate, slightly curved, 7.2–12.5 by 2.2–2.6 cm, margins slightly thickened, beaked, short-velvety. Ripe seeds not available.

Field notes – Tree with spreading branches, 6–9 m high, 7–38 cm in diameter. Bark grey to fawn, smooth, finely rugulose, inner bark cream to yellow brown, granular with a very little exudate near cambium. Slash inner wood yellow brown, hard, laminate. Leaves glossy darkish green, light green and flushing cream when young. Flowers white.

Distribution – Central Malaya (Perak, Pangkor Island). Dunn (l.c.: 191) mentioned one specimen from Java (*Horsfield 48*), which we could not locate. Considering the near endemism to Pangkor Island it will probably turn out to be something else or cultivated.

Habitat & Ecology – Hill slope facing sea, hilly local, altitude 15–305 m. Flowering time: February to June; fruiting time: June.

Vernacular names – Tulang daing, tulang daing tunggal.

17. *Fordia spec. a*

Stipules caducous. Leaf rachis 30 cm long, glabrous. Pulvinus 7–8 by 4.2–4.5 mm. Stipellae absent. Petiolules 5.3–6.6 mm long. *Leaflets* 17, (narrowly) elliptic or narrowly obovate; the terminal one not seen, the lateral ones 10–15 by 3–4 cm; base cuneate to slightly oblique, apex acuminate to cuspidate; glabrescent above (note 2 under *F. albiflora*), sparsely hairy beneath, hairs dark orange brown. Nervation sparsely hairy, glabrescent above. Midrib raised above. Secondary nerves 7–8 pairs, almost flat above. Intersecondary nerves distinct. Venation distinct, reticulate. *Inflorescence* a raminascent pseudoraceme, clustered on warty knobs on twigs, rachis up to 30 cm long. The lower placed brachyblasts long cylindric, c. 10 mm long, bearing

up to 21 densely packed flowers, the upper shorter. Pedicel c. 0.5 mm long. Bracts obovate, 1.5–2 by 0.5 mm, caducous. Bracteoles obovate, 0.5–1 by 0.5 mm, caducous. Mature flowers not available. Latex ducts not seen. Calyx imbricate, spindle-shaped, 4–6 mm long, teeth obtuse, the upper one two-topped. Petals glabrous. Immature standard lateral auricles absent, immature wing auricled on both sides. Ovules 5. Disc distinct, adnate. Pod and seeds not available.

Field notes – Small tree, c. 9 m high. Fruits red in complex spikes on the twigs tomentose.

Distribution – South Malaya (G. Panti).

Habitat & Ecology – Hillside, disturbed and regenerating forest, altitude 30 m. Flowering time: March.

Note – Known only from one specimen: *KEP-FRI 7798* collected by Cockburn at G. Panti F. R. Comp. I on 5 March 1968. This specimen resembles *F. incredibilis*, but differs in smaller leaflets, more densely packed flowers on longer brachyblasts and the higher placed disc on the wall of the hypanthium. The A duplicate, however, has a halfway cut leaf that indicates that larger leaves are possible. On the basis of such badly collected specimens placing in any species is impossible.

18. *Fordia spec. b*

Stipules narrowly triangular, 2–3 by 0.5 mm, often caducous. Leaf rachis and pulvinus absent. Petiole entirely pulvinate, 7–11 by 2–2.5 mm. *Leaves* simple, narrowly elliptic, 24–32.5 by 5.5–8.5 cm, base cuneate, apex cuspidate to caudate, glabrous above, sericeous beneath with thin silvery hairs. Nervation sericeous on both sides. Midrib raised in a furrow above. Secondary nerves 16–18 pairs, flat to sunken above. Intersecondary nerves indistinct. Venation flat, reticulate. *Inflorescence* a raminescent or (supra-)axillary pseudoraceme, rachis 3.5–5.0 cm long. Brachyblasts wartlike, 0.5–1.5 mm long bearing 2–3 flowers. Pedicel c. 1 mm long. Bracts triangular, 1–1.5 by 0.5 mm. Bracteoles narrowly triangular, 1 by 0.3 mm. *Flower* 6–8 mm long. Latex ducts absent. Calyx subtruncate, cup 2–2.3 by 2–3 mm. Standard blade suborbicular, 7–7.5 by 6–6.5 mm, outside sericeous, claw c. 1 mm long. Wing very slightly auricled on lower side, blade falcate, 6 by 2 mm, hairy basal and apical part, claw c. 2.5 mm long. Keel blade obovate, 5.5 by 3 mm, hairy basal and apical part, claw c. 3 mm long. Staminal tube c. 7 mm long. Ovary 6–7 mm long. Ovules 2. Disc indistinct. Pod and seeds not seen.

Field notes – Erect small plant 3 m tall. Young leaves brownish green, old leaves dark green, undersurface light green. Fruits green, cauliflorous. Peduncle green. Pedicels short, green. Calyx white. Corolla white.

Distribution – Borneo (Bukit Raya).

Habitat & Ecology – Forest margin, tractor roadside, altitude low. Flowering and fruiting time not known.

Note – Only known from the specimen *Wiriadinata 3320*. This specimen differs from the other Bornean species *F. brachybotrys* and *F. splendidissima* only in its large unifoliolate leaves. When relations in this complex are clearer this specimen might be placed within the *F. splendidissima*–*F. brachybotrys* group.

IDENTIFICATION LIST

This list includes only additional material to the identification list in Buijsen (Blumea 33, 1988, 259). Material seen from BM, C, K, L, P, S.

Fordia

- | | |
|------------------------|---------------------------|
| 1. <i>albiflora</i> | 10. <i>nivea</i> |
| 2. <i>brachybotrys</i> | 11. <i>ophirensis</i> |
| 3. <i>bracteolata</i> | 12. <i>pauciflora</i> |
| 4. <i>cauliflora</i> | 13. <i>rheophytica</i> |
| 5. <i>incredibilis</i> | 14. <i>splendidissima</i> |
| 6. <i>johorensis</i> | 15. <i>stipularis</i> |
| 7. <i>lanceolata</i> | 16. <i>unifoliata</i> |
| 8. <i>leptobotrys</i> | 17. <i>species a</i> |
| 9. <i>ngii</i> | 18. <i>species b</i> |

Afriastini 38A: 14 — A. M. 211: 14.

Balajadia 3813: 2 — bb series 19178: 2 — Beaman 7663: 14; 7836: 14 — Bons d'Anty 244: 8; 251: 8 — BRUN series 7871: 14.

Chow & Wan 80081: 8 — Clemens 10251: 2; 30267: 14 — Curtis 1615: 16; 2459: 1; 3564: 16. Elsener 216: 14.

Forbes 2915: 10; 2916: 10 — Forman 451: 2.

Geesink 9345: 14 — Gibbs 3001: 14.

Hallier 1329: 14; 3102: 2; 3201: 14 — Hamid 10465: 3 — Hansen 123: 2 — Haviland (524)y: 14; 2893: 14 — Henry 12792: 8; 12792A: 8 — Herb. Hongkong 5190: 4 — H. L. 9079: 4.

J. C. 1627: 6.

KEP-FRI series 2991: 3; 3069: 16; 3103: 16; 3905: 1; 5703: 1; 7798: 17; 7873: 9; 7994: 1; 8640: 1; 8712: 5; 12986: 1; 14078: 1; 14082: 1; 29074: 1 — Keßler 380: 14 — King's Coll. 4251: 16; 4467: 1; 4492: 16; 5357: 1; 5833: 1; 5993: 1; 6077: 1; 6709: 1; 6842: 1 — KL series 1678: 1 — KLU series 187: 1; 9053: 1; 15200: 9 — Kokawa & Hotta 659: 2; 5975: 14 — Kostermans 4215: 14.

Lewis 135: 9.

Maidin 1756: 2; 4585: 14 — Mail 4332: 2 — Main 2155: 14 — Maingay 606: 1 — Mogea 3618: 14 — Morse 292: 4.

NGS series 395: 2; 1684: 10 — Nooteboom 1057: 14; 4178: 2; 4335: 14; 4387: 2; 4834: 14; 5002: 14.

Onggib 10589: 14 — Orolfo 1316: 2.

Ridley 2088: 3; 2641: 1; 8004: 16; 8598: 3 — Ridsdale 375: 13 — Rutten 37: 14; 437: 14; 462: 2; 498: 14; 554: 14; 585: 14.

S series 26127: 14; 41927: 14; 42874: 14; 44844: 14; 46083: 14; 46146: 2; 46559: 14 — SAN series 56822: 14; 66800: 2; 69928: 14; 69995: 2; 72159: 14; 78498: 2; 96944: 14; 97378: 2; 99543: 14; 101454: 2; 109272: 2 — Scortechini 1948: 1 — SF series 20072: 1; 31509: 1; 32042: 9; 37025: 5 — Shiu Ying Hu 6700A: 4 — Stone 13568: 2.

TBF series 1431: 10; 1836: 10.

Vaughan 10614: 4 — Veldkamp 8044: 2 — Vermeulen 1194: 2.

Wiriadinata 288: 14; 3320: 18.

Changes in Buijsen's identification list:

Enggoh 10589 = Onggib 10589.

Forman 451: 2.

Hallier 3279: mixed.

Kokawa & Hotta 650: 2.

Mogea 3618: 14.