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REVISION OF THE GENUS FORDIA (PAPILIONACEAE: MILLETTIEAE)

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SUMMARY

In *Fordia*, a small genus of Southeast Asian Papilionaceae, 8 species are accepted and 2 subspecies, one of which is newly described (*F. splendidissima* subsp. *rheophytica*). The name of *F. splendidissima* is a new combination of an old name proposed by Miquel. Six names (among which *F. coriacea*, *F. gibbsiae*, and *F. filipes*) are sunk into the synonymy of *F. splendidissima* subsp. *splendidissima*. Three species are excluded from *Fordia*. A cladistic analysis was made of the 9 taxa in *Fordia* and some related species. A key to the taxa, descriptions, and synonymy are given as well as 4 figures (including one map) and a table.

The genus *Fordia* was first described by Hemsley (1886), with *F. cauliflora* as its only species, based on specimens collected in the Chinese province of Kwangtung.

The former monographer, Dunn (1911) included 5 species in *Fordia*, three of which were newly described and *Millettia stipularis* was transferred to it.

SYSTEMATIC POSITION

In his survey of the genera of the tribe Millettieae, Geesink (1984: 94, 95) characterized *Fordia* by the rami- and/or caulinascent inflorescences and the capacity to flower and germinate in the dark understorey of evergreen forests, combined with a monothetic set of characters, including e.g. a subtruncate calyx and 2 ovules. Due to the various and complex relations of the genus *Millettia*, Geesink (1984: 95) decided to regard *Fordia* as a distinct genus instead of adding the characters of *Fordia* to the circumscription of *Millettia*. This consideration had earlier already been mentioned by Dunn (1911) and Whitmore (pers. comm.).

The history of the tribe Millettieae is summarized by Geesink (1984: 2) as the history of three groups and of some 'nomadic' genera. *Fordia* is placed in group 2: the genera 'around Millettia'. The other two groups are the genera 'around *Tephrosia*' and 'around *Derris*'.

Geesink (1984: 95) mentioned the close resemblance of the genus *Fordia* with the continental Southeast Asian group around *Millettia pulchra*. I found another close resemblance with two species of the genus *Imbralyx* in Malaya and Sumatra. These two species were formerly described by Whitmore (1969: 4, 5) in *Fordia*. The characteristic combination of characters of the genus *Imbralyx* given by Geesink

(1984: 95, 96) is then extended with supra-axillary and raminascent inflorescences. *Imbralyx* differs from *Fordia* in having distinctly imbricate calyx lobes and spindle-shaped flowerbuds, combined with more or less distinct basal callosities of the standard, a characteristic leaflet nervation, and a higher number of ovules.

MORPHOLOGY

Vegetative parts — The species of *Fordia* are shrubs, treelets, or trees (up to 30 m) which have the (at least in Asian Papilionoideae) rather unique capacity to flower and germinate in the dark understorey of evergreen forests.

The leaves are spirally arranged and imparipinnate, in *F. brachybotrys* unifoliolate leaves occur in between pinnately compound leaves. The rachis of the leaves always includes an infrajugal part with a pulvinus at the base. The ultrajugal part of the rachis is distinct, except in *F. lanceolata* which also has sessile terminal leaflets. The stipules are persistent or caducous, usually narrowly to linear triangular, in *F. stipularis* narrowly elliptic. Stipellae are present in *F. lanceolata, F. cauliflora* and *F. pauciflora* and absent in the other species. The presence or absence of stipellae is a diagnostic character.

The leaflets are opposite or occasionally subopposite in some leaves. The blades of the leaflets are symmetric and have different shapes (obovate, elliptic, ovate, etc.), only *F. splendidissima* subsp. *rheophytica,* a rheophyte, possesses exclusively linear leaflets. The margin is always entire. The apex of the leaflets varies from acuminate to cuspidate to caudate, only in *F. splendidissima* subsp. *rheophytica* the leaflets possess an acute apex. The nervation is usually distinct, the midrib and secondary nerves are sunken, flat, raised in a furrow, or raised on the upper side of the leaflets. This proved to be a useful discriminating character between the species. The indument of the lower surface of the leaflets ranges from glabrous to sericeous and sometimes varies within one species.

Inflorescence — The flowers are usually arranged in rami- and/or caulinascent pseudoracemes, often combined with axillary and/or supra-axillary ones, except in *F. pauciflora* which has the flowers clustered on woody brachyblasts directly on the trunk or branches. In some specimens of *F. brachybotrys* panicles occur or intermediate forms between pseudoracemes and panicles.

A pseudoraceme consists of a raceme with fascicles which are contracted into brachyblasts. These brachyblasts are wart-like or thick to slender cylindric. In some specimens of *F. brachybotrys* the fascicles are not contracted into brachyblasts, thus forming true panicles. In other specimens of the latter species the inflorescences can be intermediate between pseudoracemes and panicles.

The number of fascicles per inflorescence and the length of the rachis are variable and even can vary within the species. The number of the flowerbuds per brachyblast ranges from 2 to 20 and is usually more or less constant within the species but in *F. brachybotrys* the number of flowerbuds varies from 2 to 15.

Flower — The papilionate flowers of *Fordia* are 6–15 mm long. The bracteoles are situated on the top of the pedicel or in *F. brachybotrys* incidentally on the upper part of the pedicel.

The calyx is campanulate, the upper side of the cup is usually obscurely lobed, in *F. johorensis* the upper side is obscurely toothed and in *F. brachybotrys* sometimes truncate.

Latex ducts occur occasionally in the bracteoles and calyx of *F. brachybotrys, F. splendidissima* and *F. pauciflora*. In *F. cauliflora* the petals have latex ducts and in *F. pauciflora* the wing and keel petals can have latex ducts.

The standard blade is about orbicular, basal callosities are absent and usually the blade is not auricled at the base, except in *F. lanceolata* and sometimes slightly so in *F. splendidissima*. The outside of the blade is usually sericeous, except in *F. johorensis*; the inside is glabrous.

The wing and keel petals usually have a basal and an apical hairy area outside. The wings are usually slightly adherent to the keel petals by means of lateral pockets and furrows. The keel petals are partly connate along the lower margin from halfway to beneath the apex. The wings are equal to or slightly longer than the keel.

The filament of the vexillary stamen is partly connate with those of the other 9 stamens, together forming a tube around the pistil. The free parts of the filaments are alternately longer and shorter and also gradually longer towards the lower side. The connate part of the filaments is about 4/5th of their total length. The anthers are uniform.

The disk is usually indistinct, except in *F. brachybotrys* and sometimes in *F. splendidissima* subsp. *splendidissima* which have an annular disk at the base of the ovary. The ovary is sericeous and laterally flattened. The style is curved upwards and entirely glabrous or sericeous at the lower part and glabrous at the upper part. The number of ovules for all species of *Fordia* is 2, occasionally 3, and rarely 4. These deviating numbers of ovules occur in all species of which I saw much material.

Fruit and seeds — The pods are usually (sub)falcate, in *F. lanceolata* elliptic. They are tardily dehiscent, rather thin woody and without wings. The beaked apex of the pod is straight or curved downwards and varies within one species. The diagnostic value of the pods is limited.

The seeds are lens-shaped to elliptic, reniform, transversely elliptic, or (sub)-quadrate. The rim aril is not fleshy or enlarged, but distinctly a shrivelled remainder of the funicle. The seed coat is smooth and usually dark brown; *F. lanceolata* has reddish brown seeds.

CLADISTIC ANALYSIS OF THE GENUS FORDIA

In order to reconstruct the phylogeny of the genus *Fordia,* the data-matrix in table 1 has been analyzed. The latest version of the algorithm CAFCA (Zandee, 1987; Geesink & Zandee, 1988) was applied, which is a combined parsimony/group compatibility method. The matrix contains the 9 taxa of *Fordia* and 3 selected species belonging to the genus *Imbralyx* (separated from *Millettia,* see Geesink, 1984: 95) namely *Imbralyx albiflorus, Millettia leptobotrya,* and *Fordia ngii* (see excluded species). Combinations of the latter two species under *Imbralyx* are not yet made, hence the old combinations. Furthermore, *Millettia pulchra* was added, a species

Table 1. Data-matrix. See text for explanation.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Fordia lanceolata	*Fordia cauliflora*	*Fordia pauciflora*	*Fordia stipularis*	*Fordia johorensis*	*Fordia splendidissima* subsp. *splendidissima*	*Fordia splendidissima* subsp. *rheophytica*	*Fordia ophirensis*	*Fordia brachybotrys*	*Millettia pulchra*	*Fordia ngii*	*Imbralyx albiflorus*	*Millettia leptobotrya*	hypothetical ancestral spp.
1. stipellae present	1	1	1	0	0	0	0	0	0	1	0	0	0	1
2. stipellae absent	0	0	0	1	1	1	1	1	1	0	1	1	1	0
3. midrib raised in a furrow on upper surface	0	0	0	1	0	1	1	0	1	0	0	0	0	0
4. midrib raised on upper surface	1	0	0	0	1	0	0	0	0	0	1	1	1	1
5. midrib sunken or flat on upper surface	0	1	1	0	0	0	0	1	0	1	0	0	0	0
6. lower surface leaflets sericeous	0	1	0	1	0	0	1	0	1	1	0	0	0	0
7. lower surface leaflets glabrous	0	0	0	0	1	0	0	0	0	0	0	1	0	0
8. lower surface leaflets with scattered hairs	1	0	1	0	0	0	0	1	0	0	1	0	1	1
9. lower surface leaflets glabrous to sericeous	0	0	0	0	0	1	0	0	0	0	0	0	0	0
10. axillary and terminal panicles	0	0	0	0	0	0	0	0	0	1	0	0	1	0
11. axillary pseudoracemes	0	0	0	0	0	0	0	0	0	1	0	0	1	0
12. raminascent-caulinascent pseudoracemes	1	1	0	1	1	1	1	1	0	0	1	0	0	0
13. raminascent-caulinascent pseudoracemes to panicles	0	0	0	0	0	0	0	0	1	0	0	0	0	0
14. brachyblasts directly on trunk and branches	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15. raised nervation similar on both surfaces	1	0	0	0	1	0	0	0	0	0	1	1	1	1
16. nervation not similar on both surfaces	0	1	1	1	0	1	1	1	1	1	0	0	0	0
17. flowerbuds spindle-shaped	0	0	0	0	0	0	0	0	0	0	1	1	1	0
18. flowerbuds not spindle-shaped	1	1	1	1*	1	1	1	1*	1	1	0	0	0	1
19. basal callosities +	0	0	0	0	0	0	0	0	0	0	0	1	0	0
20. basal callosities ±	0	0	0	0	0	0	0	0	0	0	1	0	1	1
21. basal callosities 0	1	1	1	1*	1	1	1	1*	1	1	0	0	0	0
22. ovules 2	1	1	1	1*	1	1	1	1*	1	0	0	0	0	1
23. ovules 2–6	0	0	0	0	0	0	0	0	0	1	1	1	1	0
24. calyx subtruncate	1	1	1	1*	1	1	1	1*	1	0	0	0	0	1
25. calyx distinctly lobed	0	0	0	0	0	0	0	0	0	1	1	1	1	0

Table 1 (continued)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Fordia lanceolata	*Fordia cauliflora*	*Fordia pauciflora*	*Fordia stipularis*	*Fordia johorensis*	*Fordia splendidissima* subsp. *splendidissima*	*Fordia splendidissima* subsp. *rheophytica*	*Fordia ophirensis*	*Fordia brachybotrys*	*Millettia pulchra*	*Fordia ngii*	*Imbralyx albiflorus*	*Millettia leptobotrya*	hypothetical ancestral spp.
26. calyx lobes imbricate	0	0	0	0	0	0	0	0	0	0	1	1	1	0
27. calyx lobes not imbricate	1	1	1	1*	1	1	1	1*	1	1	0	0	0	1
28. pods short velvety	0	0	0	0	0	0	0	0	0	0	1	1	0	1
29. pods not short velvety	1	1	1	1	1	1	1	1	1	1	0	0	1	0
30. brachyblasts 1–7 mm long	1	1	1	1	0	1	1	1	1	1	1	0	0	0
31. brachyblasts 7–20 mm long	0	0	0	0	1	0	0	0	1	0	0	0	1	0
32. brachyblasts absent	0	0	0	0	0	0	0	0	0	0	0	1	0	1

belonging to the type section of *Millettia*. The choice of these species is based on similarities in fruit (few-seeded, thin-walled) while the typical caulinascent inflorescences are lacking. They seemed to be the most suitable candidates for possible outgroups.

No fully developed flowers were available of *F. stipularis* and *F. ophirensis*. The flower data of these two species are not expected to deviate from those of the other taxa of *Fordia* and are therefore filled in accordingly. These data are marked in the data-matrix with an asterisk.

The character states 24–25 and 26–27 represent two mutually dependent characters. These states are not combined to one character, in order to keep open all options for combinations of character states and state changes. These combinations have to be checked afterwards, because cladograms based on biological implausible combinations are unacceptable.

For the exact definitions of the cladistic terms applied hereafter see Zandee (1987) or Geesink & Zandee (1988). For the recognition of cladogenetic units (clada) the definition of partial monothetic sets was applied, leading to clada sufficiently characterized by one or more unique character states. Various selection criteria, based on different parsimony definitions, were applied, but the default-criterion (maximum support minus homoplasies) gave the same results as the other criteria.

By this method 6 not fully resolved cladograms were generated. All of them have similar structural components: *F. stipularis, F. splendidissima* subsp. *splendidissima, F. splendidissima* subsp. *rheophytica,* and *F. brachybotrys* in one cladon and *F. cauliflora, F. pauciflora, F. ophirensis.* [*Millettia pulchra* was consistently placed in this latter cladon; its – a priori conceived – plesiomorphies were depicted as

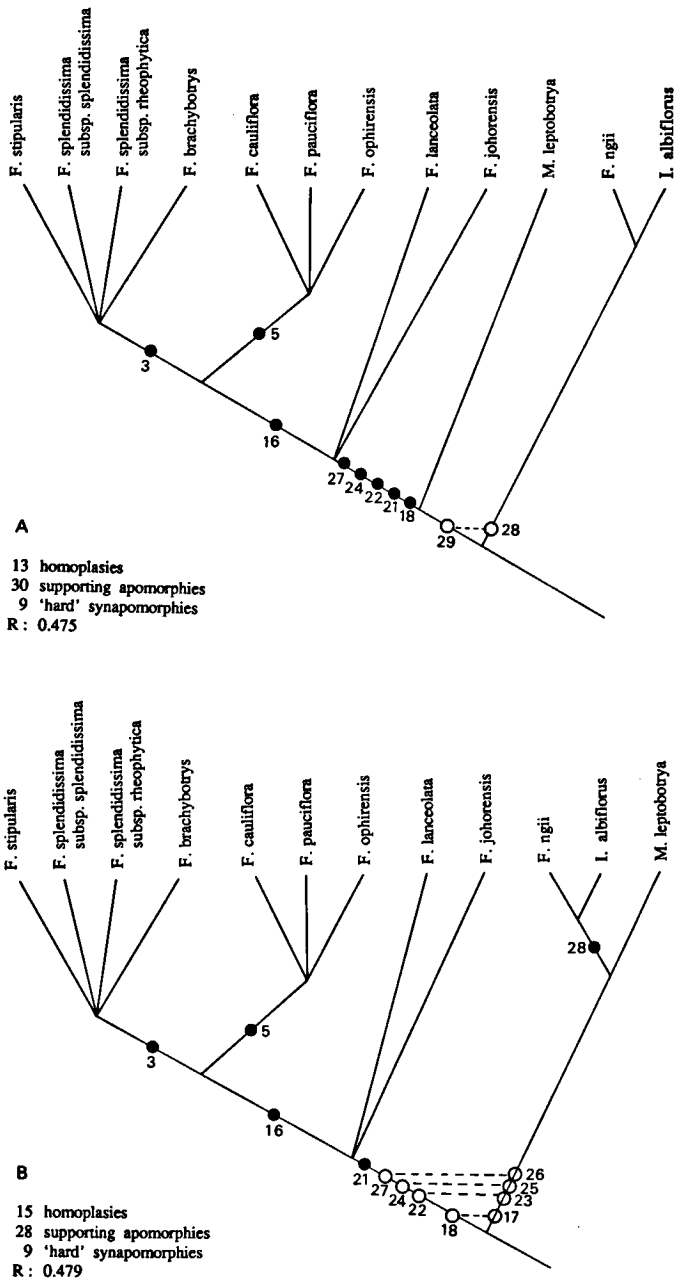
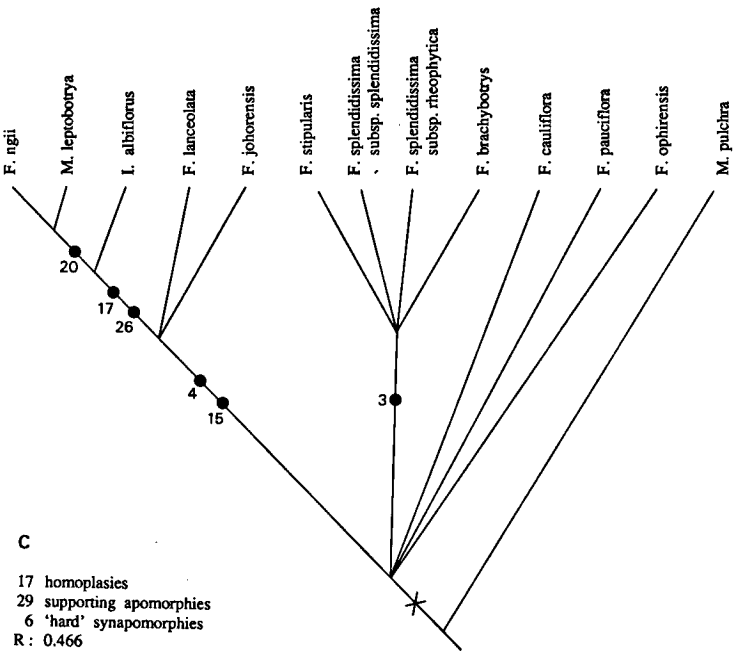
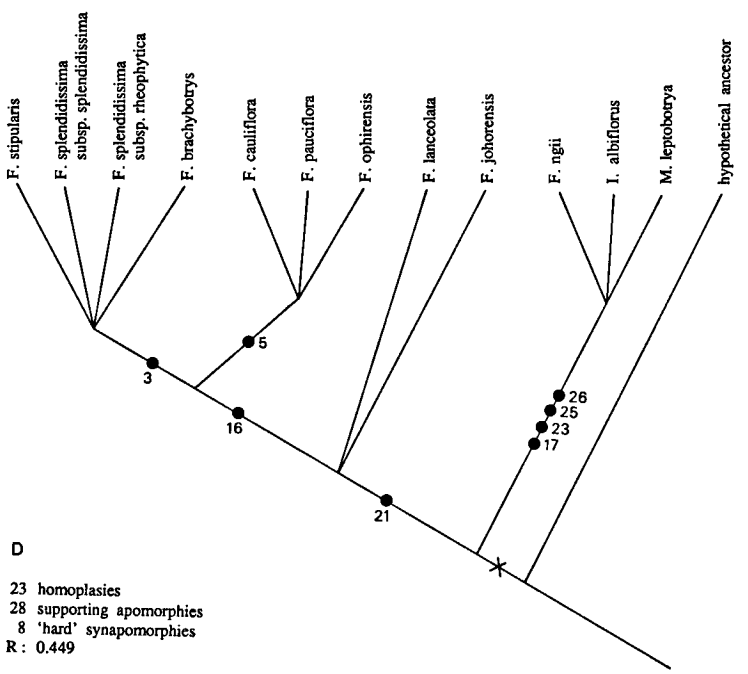


Fig. 1. Cladograms of the taxa of table 1. – A: Cladogram with the least number of homoplasies and the highest support. – B: Cladogram with the highest redundancy index. – C: Selected cladogram with *Millettia pulchra* as global outgroup. – D: Selected cladogram with a hypothetical ancestral species as outgroup. – 1 = unique synapomorphies; 2 = alternative, undecidable synapomorphies.



C

17 homoplasies
29 supporting apomorphies
6 'hard' synapomorphies
R : 0.466



D

23 homoplasies
28 supporting apomorphies
8 'hard' synapomorphies
R : 0.449

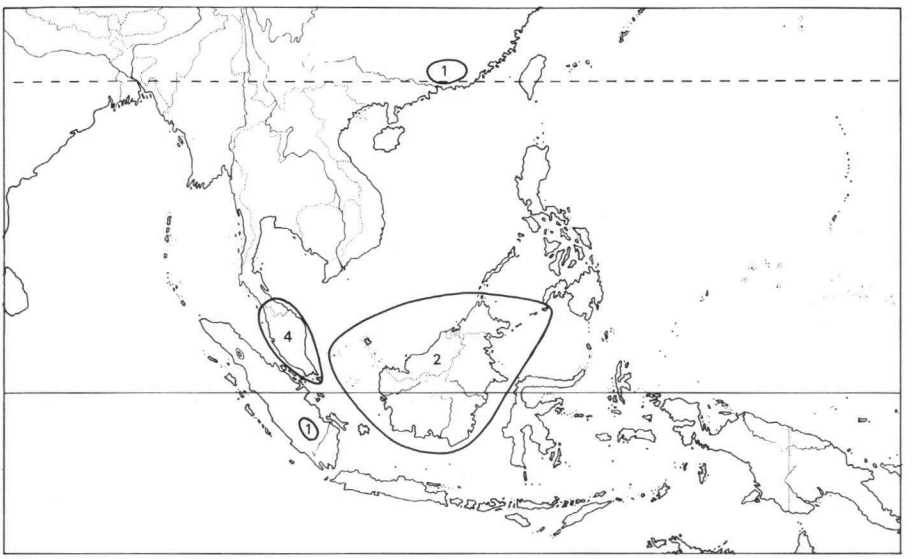


Fig. 2. Distribution of the genus *Fordia*. The numbers refer to the number of species occurring in the four areas.

reversals. Apart from blunt parsimony there are no convincing arguments in favour of this view, therefore this hypothesis suggested by the procedure was ignored, and *M. pulchra* consequently removed from the resulting cladograms.] These two clada together form one cladon.

The lowest number of homoplasies (13) and the highest number of supporting apomorphies (30; including dummy chararacters for the terminal taxa) occurred in one cladogram, which is depicted in fig. 1A. Only the uniquely derived character states (the 'hard' characters) supporting the clada have been filled in.

The Redundancy Index (see Geesink & Zandee, 1988) and the Consistency Index (Kluge & Farris, 1969: 7) were also calculated. The cladogram with the highest Redundancy Index is shown in fig. 1B and here *Millettia leptobotrya* is grouped in one cladon together with two species here considered to belong to *Imbralyx*.

In order to determine which character states (e.g. 17 or 18, 26 or 27) are apomorph and which are plesiomorph, a global outgroup was added to the cladograms. With *Millettia pulchra* as the global outgroup four cladograms were generated. The selected cladogram is represented in fig. 1C. This cladogram is poorly resolved. With a hypothetical ancestral species, provided with the more primitive characteristics of the paraphyletic assemblage *Callerya* (see Geesink, 1984: 82–84) as the global outgroup also four cladograms were generated. The selected cladogram (fig. 1D) is better resolved than the former one and more in conformity with the first two cladograms (fig. 1A & B). The character states 17 (flowerbuds spindle-shaped), 23 (ovules 2–6), 25 (calyx distinctly lobed), and 26 (calyx lobes

imbricate) are synapomorphies for the three *Imbralyx* species. Character state 21 (standard basal callosities not distinct) is a synapomorphy for all taxa of *Fordia*. With the addition of more species of *Imbralyx* and trial-runs with different outgroups, the (syn)apomorphies for the genera *Fordia* and *Imbralyx* can become different from those mentioned above.

According to the concept of 'taxonomic credibility' (Geesink & Zandee, 1988: 162) clada supposed to represent actual historical groups should preferably be based on more than one apomorphy only. The grouping of the taxa of *Fordia* is based on single apomorphies (all nervation characters). This is considered to be a bit meagre. Therefore no taxonomic conclusions concerning the genus *Fordia* were drawn from the cladograms. It is apparent that more characters must be found in order to achieve a more convincing reconstruction of the phylogeny of this group. Characters that are sufficient for distinction of the OTU's are often insufficient for cladistic purposes.

DISTRIBUTION

The eight species of *Fordia* inhabit Southeast China, Borneo, the Philippines (only the Sulu Archipelago), Anambas Islands (Siantan), Sumatra, Malaya and the southernmost part of Peninsular Thailand (Fig. 2). All species of this genus occupy a restricted geographical area. Four species occur in Malaya, three of which are endemic (*F. ophirensis, F. johorensis,* and *F. lanceolata*) and one species (*F. pauciflora*) also occurs in South Peninsular Thailand.

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FORDIA

Fordia Hemsley, in Forbes & Hemsley, J. Linn. Soc. 23 (1886) 160; Taub. in E. & P., Nat. Pfl. Fam. 3, 3 (1894) 271; Nachtr. 4 (1914) 137; Dunn, Kew Bull. (1911) 63; Ridley, Fl. Mal. Pen. 1 (1922) 586; Hutch., Gen. Fl. Pl. 1 (1964) 378; Whitmore, Tree Fl. Malaya 1 (1972) 293; Geesink, in Polhill & Raven, Adv. Legume Syst. (1981) 257; Allen & Allen, Leg. Nod. (1981) 289; Geesink, Leiden Bot. Ser. 8 (1984) 94. – T y p e: *F. cauliflora* Hemsley.

Shrubs, treelets, or trees. *Leaves* spirally arranged, imparipinnate or incidentally unifoliolate (in *F. brachybotrys*). Stipules persistent or caducous. Rachis pulvinate at base, ultrajugal part usually distinct. Stipellae absent or present. Petiolules entirely pulvinate. *Leaflets* (sub)opposite, up to 17 pairs; base usually rounded to acute; margin entire; apex usually acuminate to caudate; upper surface of leaflets glabrous, except for usually the nervation. Midrib raised on undersurface. Secondary nerves alternately on either side of the midrib, often parallel to the base of leaflets, raised on undersurface, forming marginal arches; tertiary arches usually indistinct. Intersecondary nerves distinct or indistinct. Venation reticulate, usually distinct. Pseudoracemes, panicles, or intermediate forms rami- and/or caulinascent, axillary, supra-axillary, or brachyblasts inserted directly on the trunk or branches (in *F. pauciflora*). Brachyblasts wart-like or thick to slender cylindric, with 2–20 flowerbuds. Bracts to the brachyblasts (narrowly) triangular, caducous. Bracts to the flowers triangular or ovate to broadly ovate, caducous. Bracteoles 2, usually on top of pedicel, elliptic to broadly ovate, sometimes with 2 latex ducts, sericeous, caducous. *Flowers* papilionate, up to 15 mm long, pedicelled. *Calyx* campanulate, usually obscurely lobed, outside sericeous (in *F. brachybotrys* glabrous to puberulous), inside glabrous; latex ducts absent or present, 7–11, more or less distinct. Standard blade about orbicular, reflexed at base; without basal callosities; base usually not auricled; outside sericeous (glabrous in *F. johorensis*), inside glabrous. Wing blades free, spathulate to subfalcate, equal to or slightly longer than the keel; upper auricle distinct, lower auricle slightly to distinctly developed or absent; usually with a basal and apical hairy area outside; lateral furrow usually distinct. Keel blades (sub)falcate, partly connate along lower margin from halfway to (just) beneath the apex; upper auricle present; usually with a basal and apical hairy area outside; lateral pockets usually discernible. Vexillary filament adnate to the other 9; filaments alternately longer and shorter, gradually longer towards the lower side; basal fenestrae distinct. Anthers uniform. Disk usually indistinct or sometimes distinct, annular. *Ovary* sericeous, laterally flattened. Style curved upwards, glabrous or lower part sericeous; stigma capitate, glabrous. Ovules 2, rarely 3 or 4. *Pod* usually subfalcate to falcate or sometimes elliptic, tardily dehiscent, rather thin woody, flat or sometimes slightly convex around seeds, without wings, apex beaked. *Seeds* lens-shaped to elliptic, or reniform, transversely elliptic, or (sub)quadrate, laterally flattened to convex, smooth.

KEY TO THE SPECIES AND INFRASPECIFIC TAXA

For the explanation of less usual terms is referred to M.T.M. Bosman & A.J.P. de Haas, A revision of the genus *Tephrosia* (Leguminosae-Papilionoideae) in Malesia, Blumea 28 (1983) 438, and to R. Geesink, Scala Millettiearum, Leiden Botanical Series 8 (1984) 59.

1a. Stipellae present (can be minute) 2
b. Stipellae absent 4

2a. Stipellae 1–2 mm long; midrib and secondary nerves raised on upper surface; pod elliptic, 6–7 by 2.5–3 cm ..... **4. F. lanceolata**
b. Stipellae 2–7 mm long; midrib and secondary nerves sunken or flat on upper surface; pod subfalcate to falcate, 7.5–12 by 1.5–2.5 cm 3
3a. Leaflets 23–25; pseudoracemes ..... **2. F. cauliflora**
b. Leaflets 9–11; flowers or fruits clustered on woody brachyblasts directly on trunk or branches ..... **6. F. pauciflora**
4a. Flowers or fruits clustered on woody brachyblasts directly on trunk or branches **6. F. pauciflora**
b. Pseudoracemes, panicles or intermediate forms 5
5a. At the apex of branches large stipules, narrowly elliptic, 1.5–3.5 cm long **8. F. stipularis**
b. At the apex of branches small stipules, narrowly to linear triangular, 0.2–1.2 cm long, or stipules caducous 6
6a. Pseudoracemes; brachyblasts long cylindric, recurved, 7–12 mm long, with 15–20 flowerbuds; midrib on upper surface raised; lower surface of leaflets glabrous (×30 magn.) ..... **3. F. johorensis**
b. Pseudoracemes, panicles, or intermediate forms; brachyblasts wart-like or thick to slender cylindric, not recurved, 1–20 mm long, with 2–15 flowerbuds; midrib on upper surface raised, raised in a furrow, flat, or sunken, if raised, then lower surface of leaflets hairy (× 30 magn.) 7
7a. Leaf-index of at least some leaflets more than 6. Apex of leaflets acute, tip indistinct. Rheophyte ..... **7b. F. splendidissima** subsp. **rheophytica**
b. Leaf-index of all leaflets less than 6. Apex of leaflets acuminate to caudate, tip 0.4–4 cm long. Not rheophytic 8
8a. Midrib sunken on upper surface; secondary nerves invisible or nearly invisible on upper surface; leaflets 17–35 ..... **5. F. ophirensis**
b. Midrib raised, raised in a furrow, or flat on upper surface; secondary nerves usually visible on upper surface; leaflets 1–17-(19–27) 9
9a. Disk indistinct or sometimes distinct, then low and lobed, stipe not enclosed by disk; flowers 7–13 mm long; pseudoracemes; brachyblasts 1–7 mm long; stipules caducous; leaflets (5–)7–17(–19–27) **7a. F. splendidissima** subsp. **splendidissima**
b. Disk distinct, open at vexillary side or sometimes closed (mostly in older flowers), not lobed, stipe enclosed by disk; flowers 12–15 mm long; pseudoracemes, panicles, or intermediate forms; brachyblasts 1–20 mm long, branchlets of panicles up to 6.5 cm long; stipules persistent or caducous; leaflets 1–7 (–9) ..... **1. F. brachybotrys**

1. Fordia brachybotrys Merr.

Fordia brachybotrys Merr., Philipp. J. Sc. 30 (1926) 397. – T y p e: *Ramos & Edaño 44277* (K, holo; iso P, SING), Philippines, Tawitawi.

Stipules 2–7 by 0.3–1 mm, usually early caducous. Rachis of leaf 0.3–30 cm long, 1–2.5 mm in diameter, glabrous to sericeous; pulvinus 3–11 mm long. *Leaflets* 1–7(–9), stipellae absent; ovate to elliptic to obovate or broadly elliptic to broadly obovate, 2–34 by 1–12 cm, lower surface sericeous; base rounded to acute; apex cuspidate to caudate, tip 1–4 cm long; petiolules 4–15 mm long. Nervation hairy on both surfaces or glabrous on upper surface. Midrib raised, raised in a furrow, or flat on upper surface. Secondary nerves 5–12 on each side of the midrib, flat to raised on upper surface. Intersecondary nerves variably distinct. Venation reticulate, raised on lower surface, flat to raised on upper surface. Pseudoracemes, panicles, or intermediate forms (see note 3) caulinascent, raminascent, axillary and supra-axillary, 4–23.5 cm long. Brachyblasts wart-like or thick to slender cylindric; 1–20 mm long, with 2–15 flowerbuds; branchlets of panicles up to 6.5 cm long, with 5–10 flowerbuds. Pedicel 2–12 mm long. Bracteoles elliptic to broadly ovate, 1–1.5 by 0.3–0.8 mm, sometimes with 2 latex ducts. *Flower* 12–15 mm long. *Calyx* not lobed or obscurely lobed, cup 3.5–5 by 3–5 mm; latex ducts absent or present, c. 10. Standard blade suborbicular, suborbicular-ovate, or broadly obovate, 8–11.5 by 7.5–11 mm; claw 1.5–3 mm long. Wing blades auricled at both sides, slightly so at carinal side or at vexillary side only, 8–10 by 2–3 mm, sericeous at basal and apical part; claw 2–4 mm long. Keel blades 6.5–10 by 2.5–4 mm, sericeous at basal and apical part; claw 2–4 mm long. Staminal tube and free part of filaments 9–13 mm long. *Ovary:* stipe 1–3 mm; body 5–9 mm; style 2–5 mm. Disk distinct, open at the vexillary side or sometimes closed (mostly in older flowers), not lobed, stipe enclosed by disk. *Pod* subfalcate, 9.5–17.5 by 1.5–3.5 cm; beak about straight or curved downwards. *Seeds* about flatly lens-shaped, dark brown, 10–22 by 10–22 mm.

Field notes. Shrub, treelet, or tree, flowering specimens 1–23 m tall, girth 5–67 cm. Outer bark soft, smooth, greenish, greyish, or brownish, thickness 0.1–0.4 cm. Inner bark soft, fibrous, whitish, yellowish, brownish, or green, thickness 0.15–0.25 cm. Sapwood whitish. Cambium yellow. Wood light yellowish, with an antiseptic smell. Flowers white, grey, pinkish, or purple. *Calyx* pale green.

Distribution. Borneo, Philippines (Sulu Archipelago).

Habitat. Primary forest, disturbed forest; alluvial forest, on flat, occasionally flooded zone, hill sides, ridges, riverbanks. Clay loam, sandstone, sandy or basalt derived soils, limestone scree, sandy loam soil on sandstone, loam soil with lime. Altitude 0–1000 m.

Vernacular names. Borneo: tongodo (Malay, Kadazan), biansu (Malay, Iban), badi-badi (Dusun Banggi), basing-basing (Dusun Kinabatangan), obar hutan (Bajau).

Notes. 1. Some collections with gall-fruits; valves become woody and dehiscent before the fruits are fully developed. Gall-fruits beaked, 3–5 by 1–1.5 cm. Ripe seeds are not produced.

2. *Fordia brachybotrys* was originally described by Merrill as confined to the Philippines (Sulu Archipelago). Collections of Borneo, formerly identified as belonging to *F. gibbsiae* and *F. filipes*, are now recognized to belong to *F. brachybotrys*.

3. Three specimens of Sarawak (*Purseglove 5350, S 21721, S 13790*), collected on river-banks and in riverside forest, bear panicles instead of pseudoracemes. No other characters deviating from *F. brachybotrys* were found and several specimens from Sarawak, Sabah and E. Kalimantan have inflorescences intermediate between pseudoracemes and panicles.

2. Fordia cauliflora Hemsley

Fordia cauliflora Hemsley in Forbes & Hemsley, J. Linn. Soc. 23 (1886) 160, t. 4; Dunn, Kew Bull. (1911) 63. – *Millettia cauliflora* Gagn., Not. Syst. 3 (1916) 198, nom. illeg. (non *M. cauliflora* Prain). – T y p e: *Ford s.n.* (K), China, West River, cultivated in Hong Kong.

Stipules 2 by 0.1 cm. Rachis of leaf 37–38 cm long, 1–2.5 mm in diameter, glabrous, except for sericeous furrow; pulvinus 7–9 mm long. *Leaflets* 23–25, stipellae 4–7 mm long; elliptic or ovate, 3–11 by 1.5–3 cm, lower surface sericeous; base of lateral leaflets rounded to acute, of terminal leaflets acute; apex cuspidate to caudate, tip 0.5–1.5 cm long; petiolules 2–4 mm long. Nervation hairy on both surfaces. Midrib sunken on upper surface. Secondary nerves 6–9 on each side of the midrib, sunken on upper surface. Intersecondary nerves variably distinct. Venation reticulate, slightly raised on lower surface, invisible on upper surface. Pseudoracemes caulinascent; 16 cm long, in a stage also bearing 12 young fruits. Brachyblasts short, thick cylindric; 3–5 mm long (fruit-bearing). Pedicel 1–2 mm long. Bracteoles ovate to broadly ovate, 0.75–1 by 0.5–0.75 mm. *Flower* 11–12 mm long. *Calyx* obscurely lobed, cup 2–4 by 4–5 mm; latex ducts absent. Petals with latex ducts allover. Standard blade suborbicular, 9.5–10 by 7–8 mm; claw 1.5 mm long. Wing blades auricled at vexillary side, 7 by 2.5 mm, sericeous at basal and apical part; claw 3 mm long. Keel blades 7 by 3.5 mm, sericeous at basal and apical part; claw 3.5–4 mm long. Staminal tube and free part of filaments 10–11 mm long. *Ovary:* stipe 0.5 mm; body 6–7 mm; style 3–3.5 mm. Disk indistinct. *Pod* not seen. *Seeds* flatly lens-shaped, dark brown, 11 by 11–12 mm.

F i e l d n o t e s. Tree, 4 m. Flowers pink.

D i s t r i b u t i o n. China (Kwangtung).

N o t e s. 1. Only known from the type.

2. Ford collected this species during the China expedition in 1882 on the banks of the West River in Kwangtung. The trees were cultivated in the botanical garden at Hong Kong. The type was collected from these trees.

3. The measures of the pod were taken from the original description by Hemsley, because the collection I saw only had fragments of spirally curved valves.

3. Fordia johorensis Whitmore

Fordia johorensis Whitmore, Gard. Bull. Sing. 24 (1969) 4; Tree Fl. Malaya 1 (1972) 293. – T y p e: *SF 37065* (SING, n.v.; iso K), Malaya, Bt. Tinjau Laut.

Stipules caducous. Rachis of leaf 11–23 cm long, 0.5–1 mm in diameter, glabrous; pulvinus 3–5 mm long. *Leaflets* 7–13, stipellae absent; narrowly elliptic to

Fig. 3. *Fordia lanceolata* Ridley. a. Habit; b. calyx; c. standard inside; d. wing petal; e. keel petal, curved line indicates connate part; f. stamens; g. ovary; h. pod with fragment of pseudoraceme (a, b *FRI 11278*, c *FRI 4605*, d–h *KEP 104924*).

ovate, 3–8 by 1–3 cm, lower surface glabrous; base acute; apex caudate, tip 1–3 cm long; petiolules 2–5 mm long. Nervation glabrous on both surfaces. Midrib raised on upper surface. Secondary nerves 3–6 on each side of the midrib, sometimes indistinct, raised on upper surface. Intersecondary nerves indistinct. Venation finely reticulate, raised on both surfaces. Pseudoracemes caulinascent, 16–38 cm long. Brachyblasts long cylindric, recurved, 7–12 mm long, with 15–20 flowerbuds. Pedicel 1 mm long. Bracteoles early caducous. *Flower* 12 mm long. *Calyx* obscurely 4-toothed, teeth up to 1 mm high, cup 4–5 by 4–5 cm; latex ducts absent. Standard blade suborbicular, 9 by 8 mm; claw 2 mm long. Wing blades auricled at both sides, slightly so at carinal side, 9 by 3 mm, glabrous; claw 2.5 mm long. Keel blades 8 by 4.5 mm, glabrous; claw 2.5 mm long. Staminal tube and free part of filaments 10 mm long. *Ovary:* stipe 1 mm; body 6 mm; style 5 mm. Disk indistinct. *Pod* subfalcate, 8–9 by 3 cm; beak curved downwards. *Seeds* flatly lens-shaped to elliptic or transversely elliptic; dark brown, almost black, 14–17 by 12–18 mm.

Field notes. Treelet, 2–13 m. Bark smooth, grey. Leaves crowded at apex of branchlets, shiny dark green above, bright green beneath. Flowers white.

Distribution. Malaya (Johore).

Habitat. Primary forest, low undulating country.

Note. The collections of Sarawak (*S 23291*) and Sabah (*SAN 33726*), mentioned by Whitmore in Gard. Bull. Sing. 24 (1969) 4, do not belong to *Fordia johorensis*, but to *F. splendidissima* subsp. *splendidissima*.

4. **Fordia lanceolata** Ridley – **Fig. 3.**

Fordia lanceolata Ridley, Fl. Mal. Pen. 5 (1925) 304; Whitmore, Gard. Bull. Sing. 24 (1969) 5; Tree Fl. Malaya 1 (1972) 294. – Type: *Holttum 9755* (K), Malaya, Senaling Inas F.R.

Stipules 2–10 by 0.5–2 mm, often caducous. Rachis of leaf 16–32 cm long, 1–3 mm in diameter, glabrous or puberulous; pulvinus 4–10 mm long. *Leaflets* 9–19, stipellae 1–2 mm long; elliptic to narrowly elliptic, 3.5–25 by 1.5–6.5 cm, lower surface with scattered short to long white hairs; base acute, sometimes rounded; apex acuminate to cuspidate, tip 0.5–3 cm long; petiolules 1–4 mm long. Nervation hairy on both surfaces or on upper surface glabrous. Midrib raised on upper surface. Secondary nerves 8–20 on each side of the midrib, raised on upper surface. Intersecondary nerves distinct. Venation reticulate, raised on both surfaces. Pseudoracemes raminascent, axillary and supra-axillary, 7.5–19.5 cm long. Brachyblasts wart-like to short cylindric, 1–3 mm long, with 4 flowerbuds. Pedicel 1 mm long. Bracteoles broadly ovate, 0.3 by 0.5 mm. *Flower* 10 mm long. *Calyx* obscurely lobed, cup 3.5 by 3 mm; latex ducts absent. Standard blade suborbicular, 7 by 8 mm; claw 2 mm long. Wing blades auricled at both sides, also distinctly auricled at carinal side, 6.5 by 2 mm, sericeous at basal and apical part; claw 3 mm long. Keel blades 7 by 4 mm, sericeous at basal and apical part; claw 3 mm long. Staminal tube and free part of filaments 10 mm long. *Ovary:* stipe 2 mm; body 4 mm; style 4.5 mm. Disk indistinct. *Pod* elliptic, straight or ventral side rounded, 6–7 by

2.5–3 cm; beak about straight or curved downwards. *Seeds* flatly quadrate to subquadrate, reddish brown, 10–15 by 14–19 mm.

Field notes. Very common undershrub or treelet, 1.5–3.5 m. Flowers white.

Distribution. Malaya (Negri Sembilan, Selangor).

Habitat. Primary forest, ridge tops and hill sides. Altitude 500–700 m.

5. Fordia ophirensis Ridley

Fordia ophirensis Ridley, Fl. Mal. Pen. 5 (1925) 304; Whitmore, Tree Fl. Malaya 1 (1972) 294. – Type: *Hullet 802* (K), Malaya, Mt. Ophir.

Stipules 5–12 by 1–2 mm, sometimes caducous. Rachis of leaf 18–55 cm long, 1.5–3 mm in diameter, sericeous; pulvinus 3–10 mm long. *Leaflets* 17–35, stipellae absent; elliptic to ovate, 4–14 by 1.5–4 cm, lower surface with scattered short hairs; base acute or rounded; apex cuspidate to caudate, tip 0.5–2 cm long; petiolules 2–5 mm long. Nervation hairy on both surfaces. Midrib sunken on upper surface. Secondary nerves 5–9 on each side of the midrib, invisible or nearly invisible on upper surface. Intersecondary nerves indistinct. Venation finely reticulate, raised on lower surface, flat to raised on upper surface. Pseudoracemes axillary and supra-axillary, 4.5–15.5 cm long. Brachyblasts wart-like to short cylindric, 1–2.5 mm long. *Flowers* not seen. *Pod* subfalcate, 7 by 2.5 cm; beak curved downwards. *Seeds* flatly lens-shaped to subquadrate to flatly ellipsoid, dark brown, 10–12 by 11–16 mm.

Field notes. Common treelet, 3 m. Flowers whitish green.

Distribution. Malaya (Johore).

Habitat. Hill sides. Altitude 300–400 m.

Note. Known from only two collections.

6. Fordia pauciflora Dunn

Fordia pauciflora Dunn, J. Linn. Soc. 41 (1912) 237; Ridley, Fl. Mal. Pen. 1 (1922) 586; Craib, Fl. Siam. Enum. 1 (1928) 395; Whitmore, Tree Fl. Malaya 1 (1972) 294. – *Millettia cauliflora* Prain, J. As. Soc. Beng. 66, 2 (1897) 94, 363 (non *F. cauliflora* Hemsley). – Type: *King's coll. 2555* (K), Malaya, Larut.

Stipules 3–5 by 0.5–1 mm, sometimes caducous. Rachis of leaf 18–32 cm long, 1–2.5 mm in diameter, glabrous to sericeous; pulvinus 3–8 mm long. *Leaflets* 9–11, stipellae 2–7 mm long, sometimes caducous; lower leaflets orbicular to elliptic, upper leaflets ovate to elliptic, 3.5–22 by 2.5–7.5 cm, lower surface with scattered short to long hairs; base rounded to acute; apex caudate, tip 0.8–4 cm long; petiolules 3–6 mm long. Nervation hairy on both surfaces. Midrib sunken or flat on upper surface. Secondary nerves 3–8 on each side of the midrib, sunken on upper surface. Intersecondary nerves often indistinct. Venation finely reticulate, raised on lower surface, faintly prominent on upper surface. Inflorescence caulinascent or raminascent. Brachyblasts inserted directly on trunk or branches, wart-like, 1–4 mm

long, with c. 3 flowerbuds. Pedicel 3 mm long. Bracteoles ovate to broadly ovate, 0.75–1.25 by 0.5 mm, sometimes with 2 latex ducts. *Flower* 7–10 mm long. *Calyx* obscurely lobed, cup 2–3 by 3–5 mm; latex ducts absent or present, 10–12. Standard blade suborbicular or broadly ovate, 6–7 by 6–8 mm; claw 2 mm long. Wing blades auricled at both sides, slightly so at carinal side, 5–6 by 1.5–2.5 mm, glabrous; with or without latex ducts; claw 2 mm long. Keel blades 5–6 by 3–4 mm, glabrous; with or without latex ducts; claw 2 mm long. Staminal tube and free part of filaments 7 mm long. *Ovary:* stipe 1 mm; body 5 mm; style 2.5–3 mm. Disk indistinct. *Pod* subfalcate to falcate, 7.5–11 by 1.5 cm; beak about straight. *Seeds* flatly lens-shaped, dark brown, mature seeds unknown.

Field notes. Slender treelet, up to 3 m. Flowers white.

Distribution. Peninsular Thailand, Malaya (Perak).

Habitat. Evergreen forest. Altitude 150–300 m.

7. **Fordia splendidissima** (Blume *ex* Miq.) Buijsen, *comb. nov.*

a. subsp. **splendidissima**

Millettia splendidissima Blume ex Miq., Fl. Ind. Bat. 1, 1 (1855) 156. – Type: *Korthals s.n.* (L, holo; drawing in K), Borneo, South Coast.

Fordia coriacea Dunn, Kew Bull. (1911) 63; Merr., Un. Cal. Publ. Bot. 15 (1929) 105. – Types: *Haviland 80* (K, S, SING), Selabat; *Haviland 2902* (K, S), Kuching; *Hewitt s.n.* (= *Bartlett*, March 24, 1893) (SING), Kuching; *Hose 75* (K, L), Baram, Miri River.

Fordia filipes Dunn, Kew Bull. (1911) 64; Whitmore, Tree Fl. Malaya 1 (1972) 293 (see note 3). – Types: *Haviland 2893* (n.v.), *2903* (drawing in K, S, SING), Kuching.

Millettia chaperi Gagn., Not. Syst. 2 (1913) 353. – Types: *Haviland & Hose 524* (K, P, S, SING), Mt Kuching; *Chaper s.n.*, Nov. 1890 (P), Borneo, Le Lebroang.

Fordia gibbsiae Dunn & Baker [Kew Bull. (1911) 64, nom. nud.] ex Baker, in Gibbs, J. Linn. Soc. 42 (1914) 68. – Types: *Gibbs 3001* ? (n.v.), Borneo, Tambunan plain; *Haviland & Hose 3280* (K, S), Borneo; *Hose 334* (K, L), Baram.

Fordia angustifoliola Merr., Philipp. J. Sc. 11 (1916) Bot. 91. – Type: *Native coll. 198* (Bur. Sci.), Jan. 3, 1911 (K), Sarawak, Matang road.

Fordia elmeri Merr., Un. Cal. Publ. Bot. 15 (1929) 105. – Type: *Elmer 20713* (K, L, P, SING), Sabah, near Tawao.

Stipules caducous. Rachis of leaf 5.5–55 cm long, 1–5.5 mm in diameter, glabrous to sericeous; pulvinus 2–12 mm long. *Leaflets* (5–)7–17(–19–27), stipellae absent; narrowly ovate to narrowly obovate or ovate to obovate or suborbicular, 3–31 by 1–13 cm, lower surface glabrous to sericeous (see note 4); base rounded to acute; apex acuminate to caudate, tip 0.4–4 cm long; petiolules 3–10 mm long. Nervation hairy or glabrous on both surfaces or hairy on lower surface only. Midrib raised or raised in a furrow on upper surface. Secondary nerves 4–19 on each side of the midrib, sunken or flat to raised on upper surface. Intersecondary nerves variably distinct. Venation reticulate, raised on lower surface, flat to raised on upper surface. Pseudoracemes raminascent, axillary and supra-axillary, 3.5–40 cm long. Brachyblasts wart-like or thick to slender cylindric, 1–7 mm long, with 2–7 flowerbuds. Pedicel 1–6 mm long. Bracteoles ovate to broadly ovate, 0.5–1.5 by 0.3–0.8 mm, sometimes with 2 latex ducts. *Flower* 7–13 mm long. *Calyx*

Fig. 4. *Fordia splendidissima* subsp. *rheophytica* Buijsen. a. Habit; b. calyx; c. standard inside; d. wing petal; e. keel petal, curved line indicates connate part; f. stamens; g. ovary (*Chew Wee-Lek 1070*).

obscurely lobed, cup 2–5 by 2.5–5 mm; latex ducts absent or present, 7–11. Standard blade suborbicular to broadly ovate, 6–10 by 6–10 mm; claw 1–2.5 mm long. Wing blades auricled at both sides, often slightly so at carinal side, 5–9.5 by 2–3 mm, sericeous at basal and apical part; claw 1.5–3 mm long. Keel blades 5–8 by 2.5–5 mm, sericeous at basal and apical part; claw 1.5–3 mm long. Staminal tube and free part of filaments 9–11 mm long. *Ovary:* stipe 0.5–1.5 mm; body 4–5.5 mm; style 1.5–4 mm. Disk indistinct or sometimes distinct, low and lobed, stipe not enclosed by disk (see note 2). *Pod* subfalcate to falcate, 4–15.5 by 1.3–3 cm; beak about straight or curved downwards. *Seeds* flatly lens-shaped to flatly reniform or flatly subquadrate, dark brown, 5–14 by 6–19 mm.

Field notes. Common or rather common shrub, treelet, or tree, flowering specimens 1.5–30 m tall, girth 5–86 cm. Outer bark smooth, sometimes slightly rough or scaly, white, grey, yellow, green, brown, or blackish. Inner bark white, grey, green, yellow, reddish, or brown. Sapwood whitish, yellowish, or brownish. Cambium whitish, green, or brownish. Wood yellow. Twigs conspicuously pale, whitish green, or brown. Undersurface of leaves with a silvery or golden gloss, or dull. Flowers white, pinkish, mauve, violet, red, purple, dark purplish carmine, greenish purple, blue, or brownish. Calyx pale greenish, dark green, reddish brown, dark red, purplish red, purple, or dark magenta. Standard or middle of standard often paler than wings and keel. Stamens whitish, yellow, or light green. Anthers cream, yellow, or light brown. Ovary whitish or light green. Style white, cream, or pale green. Stigma light green.

Distribution. Borneo and the Anambas Islands (Siantan).

Habitat. In the understorey of primary and secondary forest; heath forest, kerangas forest, riverain forest, mountain forest, swampy forest, riparian forest on silty bank above tidal limits, riverbanks, roadsides, ridges, hills. Clay loam, sandstone; sandy, sandy loam or sandy clay loam soils, conglomerated sandstone and claystone, limestone, basalt knoll, shale derived or ultrabasic soils. Altitude 0–3500 m.

Vernacular names. Borneo: Biansu (Iban, Kapit Iban, Iban Malay), biansu bukit (Iban), sergantung (Engkari Iban), boot-buan (Keneyh), torin-torin (Sungei), tantawi (Kadayan), parang-parang, tantaroi (Dusun), tengudan, teuye (Dusun Kinabatangan), marbahai, tobah otan, tuba hutan (Malay), sintoroi toroi (Du Tambunan), tongodo (Kadazan Kinabatangan), sungei labuk (Tarau), makumpit, kaju bawi (Dayak).

Notes. 1. Several collections with gall-fruits; beaked, 2–5 by 0.4–1 cm. See note 1. under *F. brachybotrys*.

2. In some specimens of *F. splendidissima* subsp. *splendidissima* a disk occurs which is lobed and low, the stipe not enclosed by the disk. This disk differs from the one found in *F. brachybotrys* because in the latter species the disk is not lobed and encloses the stipe.

3. Whitmore (Tree Fl. Malaya 1, 1972, 293) recorded one specimen of *F. filipes* from Malaya (*FRI 3471*). This specimen does not belong to the genus *Fordia*, but is probably a *Millettia*.

4. Dunn (Kew Bull., 1911, 63) recognized three species, which are now considered to belong to one, very variable, subspecies. He distinguished *F. coriacea* from *F. gibbsiae* by the coriaceous leaflets and their shining, sericeous lower surface. Typical *F. gibbsiae* has papery leaflets and a scattered sericeous lower surface without gloss. Especially the characters of the lower surface of the leaflets are very variable; there is a continuous range from glabrous to sericeous and the gloss can be absent or variably distinct. Usually the lower surfaces which are sericeous have a golden or silvery gloss, but they also can be without gloss when the hairs are not arranged parallel. It proved to be impossible to discriminate *F. gibbsiae* and *F. coriacea* on the characters given by Dunn and no other discriminating characters were found.

Fordia filipes was distinguished from the other two species by long pedicelled flowers. The length of the pedicel is very variable, even within a specimen. It is impossible to distinguish a species by this character only. No other discriminating characters were found and *F. filipes* is also listed as a synonym of *F. splendidissima* subsp. *splendidissima*.

The possibility exists that discriminating characters are recognizable only in the field and not in the herbarium collections; therefore further investigation is recommended for a better delimitation within this possibly complex taxon.

b. subsp. **rheophytica** Buijsen, *subsp. nov.* – **Fig. 4.**

A subspecies typica habitu (frutex rheophyticus), foliolis lineariter ellipticis vel lineariter ovatis, apice acuto differt. – T y p u s: *Chew Wee-Lek 1070* (K, holo; iso L, SING), Sarawak, Baram, Sungei Tutoh. – *Fordia angustifoliola* auct., non Merr.: Van Steenis, Rheophytes of the world (1981) 273.

Rheophyte. Rachis of leaf 6–12 cm long, 1 mm in diameter. *Leaflets* 7–13, linear elliptic to linear ovate, 3.5–12.5 by 0.75–2 cm, lower surface sericeous; base obtuse; apex acute. Pseudoracemes 6–14 cm long. Brachyblasts wart-like, 1 mm long, with 2–4 flowerbuds. *Flower* 6–10 mm long. *Pod* unknown.

F i e l d n o t e s. Shrub or treelet, 1–5 m. Bark smooth, greyish. Branches erect, branched. Flowers purplish.

D i s t r i b u t i o n. North Borneo.

H a b i t a t. In rapids and along stream banks of rivers. Altitude up to 350 m.

N o t e. *Fordia splendidissima* subsp. *rheophytica* differs from *F. splendidissima* subsp. *splendidissima* in the shape and size of the leaflets and the size of the flowers. Other characters of the rheophyte are very similar to those of the forest group, therefore the rank of subspecies is applied.

8. Fordia stipularis (Prain) Dunn

Fordia stipularis (Prain) Dunn, Kew Bull. (1911) 64. – *Millettia stipularis* Prain, J. As. Soc. Beng. 66, 2 (1897) 363. – T y p e: *Forbes 2948* (CAL, holo, n.v.; drawing in K, L), Sumatra, River Roepit.

Large stipules at the apex of branches, 1.5–3.5 by 0.3–0.7 cm. Rachis of leaf 30–46.5 cm long, 2–4.5 mm in diameter, glabrous or puberulous; pulvinus 8–12

mm long. *Leaflets* 9–15, stipellae absent; elliptic to obovate, 7.5–17 by 2.5–5.5 cm, lower surface sericeous; base acute to rounded; apex cuspidate, tip 1–2.5 cm long; petiolules 4–7 mm long. Nervation hairy on both surfaces or glabrous on upper surface. Midrib raised or raised in a furrow on upper surface. Secondary nerves 6–10 on each side of the midrib, flat on upper surface. Intersecondary nerves usually distinct. Venation reticulate, flat to raised on lower surface, flat on upper surface. Pseudoracemes raminascent and supra-axillary, 9 cm long. Brachyblasts wart-like to short cylindric, 1–2 mm long. *Flowers* not seen. *Pod* subfalcate to falcate, 7.5–9 by 2 cm; beak about straight. *Seeds* unknown.

Field notes. Shrub, 3 m. Bark ash-grey. Flowers purple.

Distribution. South Sumatra (Selatan). Altitude 100 m.

Notes. 1. Only known from the type.

2. The collection in the Rijksherbarium, Leiden was made of a cultivated specimen in the botanical garden in Bogor, Java. The original material was collected by Forbes in S. Sumatra, West of Palembang. The characters of the cultivated specimen do not deviate much from those of the other specimens and are therefore included in the description.

EXCLUDED SPECIES

Fordia fruticosa Craib, Kew Bull. (1927) 60; Fl. Siam. Enum. 1 (1928) 395. – Type: *Kerr 5468* (K), Thailand, Mè Hawng Sawn, Mè Cha. = probably a *Millettia.*

Fordia incredibilis Whitmore, Fed. Mus. J. 13 (1970) 136; Tree Fl. Malaya 1 (1972) 293. – Type: *FRI 8712* (SING; iso K, L, S), Malaya, Johore, NW. slopes of G. Belumut. = *Imbralyx spec. nov. a.*

Fordia ngii Whitmore, Gard. Bull. Sing. 24 (1969) 5; Tree Fl. Malaya 1 (1972) 294. – Type: *SF 32042* (SING; iso K, L), Malaya, Johore, S. Kayu. = *Imbralyx spec. nov. b.*

IDENTIFICATION LIST
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1. *Fordia brachybotrys* Merr.
2. *Fordia cauliflora* Hemsley
3. *Fordia johorensis* Whitmore
4. *Fordia lanceolata* Ridley
5. *Fordia ophirensis* Ridley
6. *Fordia pauciflora* Dunn
7. *Fordia splendidissima* Buijsen
   a. subsp. *splendidissima*
   b. subsp. *rheophytica* Buijsen
8. *Fordia stipularis* Dunn

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  - subsp. **rheophytica** Buijsen 7b
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- stipularis (Prain) Dunn 8

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