

Studies in Malesian Gentianaceae IV: A revision of *Picrophloeus*

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ABSTRACT. *Picrophloeus* Blume is the correct generic assignment for four species forming one of several distinct lineages in the *Fagraea* complex. They include the widespread Southeast Asian *P. javanensis* Blume, otherwise commonly known by the dubious name *F. elliptica* Roxb. Three new combinations are made for species known only in Borneo: *P. belukar* (K.M.Wong & Sugau) K.M.Wong, *P. collinus* (K.M.Wong & Sugau) K.M.Wong, and *P. rugulosus* (K.M.Wong & Sugau) K.M.Wong.

Keywords. Borneo, *Fagraea elliptica*, Gentianaceae, Malesia, *Picrophloeus*, Potalieae, Potaliinae, Southeast Asia

Introduction

A molecular phylogenetic analysis of the *Fagraea* complex (Sugumaran & Wong 2012) revealed the distinctness of a number of generic lineages from *Fagraea* Thunb. s.s. (Wong & Sugumaran 2012). These included two genera, *Cyrtophyllum* Reinw. and *Picrophloeus* Blume, that are distinguished from the other lineages by their flowers with conspicuously exerted styles (typically more than 40% of their length) and filaments (greater than 70% of their length) (Sugumaran & Wong 2012). *Picrophloeus* is readily distinguished from *Cyrtophyllum* by its terminal cymes (*Cyrtophyllum* has axillary cymes) and Scarrone's tree architectural model (*Cyrtophyllum* is characterised by Aubréville's model) (Sugumaran & Wong 2012; Wong & Sugumaran 2012).

Picrophloeus is presently revised. It includes the widespread *P. javanensis* Blume, which has been much identified with the name *Fagraea elliptica* Roxb., a problematic name here shown to be dubious.

Picrophloeus Blume

Bijdr. Fl. Ned. Ind. (1826) 1019; Wong & Sugumaran, Gard. Bull. Sing. 64 (2012) 492. TYPE SPECIES: *P. javanensis* Blume.

Fagraea sect. *Cyrtophyllum* (Reinw.) Blume, Rumphia 2 (1838) 34 *pro parte* excl. *F. peregrina*; Leenhouts, Fl. Males. I, 6 (1962) 303 *pro parte* excl. *F. fragrans* & *F. umbelliflora*; Wong & Sugau, Sandakania 8 (1996) 7 *pro parte* excl. *F. fragrans*. —

Fagraea sect. *Eufagraea* Blume, Mus. Bot. 1 (1850) 172 *pro parte quoad* *F. kimangu*, *F. picrophloea* & *F. speciosa*. — *Fagraea* sect. *Parviflorae* Benth., J. Linn. Soc. Bot. 1 (1857) 100 *pro parte* excl. *C. peregrinum*. — *Fagraea* subg. *Cyrtophyllum* (Reinw.) Miq., Fl. Ind. Bat. 2 (1857) 375 *pro parte* excl. *F. lanceolata*.

Medium-sized to large trees to about 30 m tall. **Trunk** monopodial with episodic growth, developing orthotropic complexes of branches (Scarrone's architectural model *fide* Hallé et al. 1978). Trunk bark becoming fissured in older trees. Vegetative **shoot apices** with light yellowish resin. Leaf arrangement on branches decussate; leaf margin entire; **petiolar sheaths** of a leaf pair fused to form a shallow cup-like ochrea. **Inflorescence** terminal, a many-flowered and branched cyme, basal branches nearly as long as or longer than rachis. **Flowers** bisexual, small, up to 10 mm wide at the corolla mouth; calyx lobes 5; corolla lobes 5, overlapping to the right, narrowly elliptic to lanceolate; stamens 5, inserted at the corolla mouth, typically two thirds or more exsert, anthers versatile; style typically one third or more exsert; stigma capitate (knob-like). **Fruits** small, subglobose, up to about 10 mm in diameter; colour at maturity yellow-orange to bright red; with small amounts of translucent sticky latex in fruit epidermis and fruit wall; epidermis separating as a thin translucent film from pericarp (fruit surface appearing crinkled on herbarium specimens). **Seeds** numerous, placentation axile; polygonal; surface areolate.

Distribution and diversity. Sumatra, Java, Malay Peninsula, Borneo, Maluku, New Guinea. Four species known.

Habitat. Lowland to lower montane forests.

Key to *Picrophloeus* species

- 1a. Leaf surface drying very coarsely wrinkled (resembling a coarsely pitted surface to the touch). Cymes distinctly pedunculate, the peduncle to 1–1.5 cm long beyond the ultimate leaf pair on the flowering shoot. Flowers sessile (the ultimate floral bracteole immediately below the calyx cup). Corolla tubes 8–11 mm long. Filaments in open flowers 15–18 mm long. Fruits larger, 6–9(–10) mm across
..... *P. rugulosus*
- b. Leaf surface drying smooth or only finely shagreen. Cymes sessile, the basal branches not clearly elevated from the distalmost leaf pair on the flowering shoot and appearing as if they originate from the ultimate leaf axils. Flowers pedicellate (the pedicel at least a short but distinct axis between the ultimate bracteole and the calyx base). Corolla tubes shorter, 3.5–6 mm long. Filaments in open flowers (4–)6–11 mm long. Fruits smaller, 3.5–5(–6) mm across 2

- 2a. Leaf apex typically obtuse-rounded to emarginate. Inflorescence typically branched to 5–6 orders. Corolla tube 3.5–4 mm long *P. belukar*
- b. Leaf apex acuminate to cuspidate-caudate. Inflorescence branched to 3–4(–5) orders. Corolla tube 4–6 mm long 3
- 3a. Leaves thick-coriaceous, secondary veins obscure on lower side. Pedicels 0.5–1 mm long. (Restricted to Borneo, submontane to lower montane forest)
..... *P. collinus*
- b. Leaves thin-coriaceous, secondary veins distinct and prominent on the lower side. Pedicels 1–2 mm long. (Widespread: Sumatra, Java, Malay Peninsula, Borneo, Moluccas to New Guinea; lower montane forest generally but in the Wallacea region also in the lowlands, including coastal forest) *P. javanensis*

1. *Picroploeus belukar* (K.M.Wong & Sugau) K.M.Wong, **comb. nov.** — *Fagraea belukar* K.M.Wong & Sugau, Sandakania 8 (1996) 15; Coode et al. Checkl. Fl. Pl. Gymn. Brunei (1996) 174. TYPE: *Saikeh SAN 72151*, Sabah, Beaufort, Beaufort Hill (holo SAN).

F. elliptica auctt.: Leenhouts, Fl. Males. I, 6 (1962) 303 *pro parte*; Cockburn, Trees of Sabah 1 (1976) 210 *pro parte*; Ashton, Manual Non-Dipt Trees Sarawak 2 (1988) 314 *pro parte*; Anderson, Check List Trees Sarawak (1980) 239 *pro parte*. [*Fagraea elliptica* Roxb. *sensu stricto*, Fl. Ind. ed. Wall. 2 (1824) 32, *nom. dub.*]

Tree, to around 30 m tall; trunk to over 1 m in diameter; **bark** fissured, dark grey-brown. **Leaves** obovate to broad-elliptic; 7–22 cm long, 4–13 cm wide; base cuneate; apex obtuse-rounded to emarginate; margin plane to recurved; coriaceous; upper and lower surfaces smooth to finely shagreen; midrib prominent below, rounded to ridged; secondary veins 10–12 pairs, upper side faint and flat or immersed in the blade, lower side faint to immersed, not prominent; tertiary veins inconspicuous; petioles 3–4.5 cm long, stout. **Inflorescence** sessile, the basal branches not clearly elevated from the distalmost leaf pair on the flowering shoot and appearing as if they originate from the ultimate leaf axils, to c. 13 cm long, 15–20 cm across, main axis branched to 5–6 orders, with 5–6 tiers of branches; lowest branches typically 3–5.5 cm long. **Flower** pedicel (above the ultimate bracteole) 1–2 mm long; **calyx** (from the base to the lobe apices) 1–2 mm long, calyx cup 1–2 mm wide; **corolla** salverform; cream to white; corolla tube 3.5–4 mm long, not conspicuously flared, 1–1.5 mm wide, inside glabrous to minutely papillate; corolla lobes 2–3 mm long, c. 1.5 mm wide; **stamens** with filaments 6–8 mm long in the open flower; anthers oblong, c. 1 mm long; **style** 11–15 mm long in the open flower; **stigma** knob-like, c. 0.5 mm across, lobes 2, low and rounded, not recurving. **Fruit** when mature to 3.5–5 mm across; fruit calyx lobes to 1 mm long and wide. **Seeds** c. 1 mm across.

Distribution. Borneo, all districts; Banka (Bangka) Island.

Habitat. Lowland secondary forest, forest gaps, open sites. This species is a conspicuous member of the coastal tropical heath (*kerangas*) forest community of Borneo, easily seen, for example, in the Sandakan, SW Sabah, Brunei and Sarawak 1st Division areas. It is also common in secondary forest and some open degraded sites in Borneo (Wong & Sugau 1996).

Specimens examined: BORNEO. **Brunei.** Belait, Andulau F.R., *Idris et al. BRUN 15655* (BRUN, SING); Berakas, Berakas FR, *Ashton S. 7816* (BRUN, SING); Tutong, *Smythies BRUN 0836* (SING), Bukit Beruang, *Forman & Blewett 810* (BRUN, K, SING). **Kalimantan.** Bangarmassing, *Motley s.n. 1857* (K); East Kutai, Sungai Bambang, *Kostermans 6092* (SING); Long Bagun, *Wiradinata 602* (BO, K); Tarakan, *Kostermans s.n.* December 1963 (SING). **Labuan.** Botanic Garden, Natural arboretum, *Talip SAN 55629* (SAN). **Sabah.** Beaufort, Beaufort Hill, *Madani SAN 36770* (K, L, SAN, SAR), *Meijer NT 172* (SAN), *Saikeh SAN 72151* (holo SAN), *SAN 72256* (SAN, SING), *72259* (K, L, SAN, SAR, SING), Kg. Inuman, *Mikil SAN 30215* (SAN), Mantanior, *Talib & Marsal SAN 84772* (SAN, SING), mile 52 Mesapul road, *Mikil SAN 34569* (SAN); Jesselton, Gaya Island F.R., *Lajangah SAN 28776* (BO, K, KEP, L, SAN, SAR, SING), *Wyatt-Smith KEP 80298* (K, SING), (Pulau) Gaya, *Sinanggul SAN 40136* (KEP), near Ulu Soyong river, *Aban SAN 57828* (KEP, L, SAN); Jesselton, near hospital, *Tandom Nbfd 2810* (SAN); Kota Kinabalu, Bukit Padang, *Beaman 10822* (K, MSC); Sandakan, *Postar & Ahmad SAN 147987* (SAN), junction of Ernestina Road, *Brand SAN 34698* (BO, K, KEP, L, SAN, SAR, SING), Leila F.R., *Ahwing SAN 39033* (K, L), *Ampuria SAN 32601* (K, L, SAN, SAR, SING), *Jawanting & Ampuria SAN 32601* (SAN, SING), *Kanis & Ding Hou SAN 57451* (K, L, SAN), *Kumin SAN 74160* (K, L, SAN, SAR, SING), *Wong SAN 22901* (K, KEP, L, SAN, SAR); mile 3/4 North Road below Sabah Hotel, *Sam & Ernesto SAN 26522* (SAN), mile 4 Leila F.R., *Dewol & Chow SAN 74258* (K, KEP, L, SAN, SING), Pum station mainline, *Ampon & Madani SAN 47347* (SAN), town, *Meijer SAN 20945* (SAN, SING), Sepilok Laut, *Tamin SAN 131250* (SAN), *Termiji & Paul SAN 85500* (SAN); Sipitang, *Caudra A 3293* (K), Bukit Ulu Sipitang, *Dewol & Termiji SAN 78358* (K, KEP, L, SAN, SAR, SING), SFI area, *Amin SAN 126518* (SAN), forest behind SFI Qrs., *Madani & Amin SAN 86236* (SAN), Sri Beaufort Area, *Dewol SAN 80111* (SAN, SING), Merintaman F.R., *Saikeh SAN 72327* (SAN, SING), Seungau, *Cuadra A 3293* (SING); Tawau, Padang Golf, *Ismail SAN 107761* (SAN); Weston, Bukit Siungau, *Talip SAN 80618* (K, KEP, L, SAN, SAR, SING), Hutan Simpan Sianggau, *Amin SAN 126720* (SAN, SING), *SAN 132146* (SAN), Lubok Darat, *Dewol & Karim SAN 78153* (SING), *SAN 78358* (SAN). **Sarawak.** *Moulton's Native Collectors s.n.* 1909 (SING); Bukit Lan, *Wright 631* (SAR); Kuching, *Anderson S. 4921* (SAN), *Corner & Brunig 10444* (SAR), *Dickson 3* (SING), Kuching Reservoir, *Anderson & Chai S. 28943* (SAR, SING), Selang, Sungai Pasir, *Rehal S. 2251* (SING); Mukah, Ulu Kenyana, *Ashton S. 19490* (SING); Serian, Sungai Sabal Tapang, *Sinclair SFN 10266* (E, K, L, SAR, SING); Tarum, *Rehal 1750* (SAR).
SUMATRA. **Bangka.** *Jacobs IV-A-127* (SING).

2. *Picrophloeus collinus* (K.M.Wong & Sugau) K.M.Wong, **comb. nov.** — *Fagraea collina* K.M.Wong & Sugau, Sandakania 8 (1996) 19. TYPE: *Aban SAN 50747*, Sabah, Ranau, copper mining area (holo SAN; iso A).

F. elliptica auctt.: Leenhouts, Fl. Males. I, 6 (1962) 303 *pro parte*; Cockburn, Trees of Sabah 1 (1976) 210 *pro parte*; Ashton, Manual Non-Dipt Trees Sarawak 2 (1988) 314 *pro parte*; Anderson, Check List Trees Sarawak (1980) 239 *pro parte*. [*Fagraea elliptica* Roxb. *sensu stricto*, Fl. Ind. ed. Wall. 2 (1824) 32, *nom. dub.*]

Tree, to around 5 m tall; trunk to c. 25 cm diameter; **bark** fissured, dark brown. **Leaves** elliptic, oblanceolate-obovate; 4–15 cm long, 2–7 cm wide; base cuneate; apex acute; margin plane to slightly recurved; thick-coriaceous; upper and lower surfaces smooth to finely shagreen; midrib prominent below, ridged; secondary veins 7–9 pairs, upper side distinct, lower side obscure; tertiary veins obscure; petioles 1.5–2 cm long, stout. **Inflorescence** sessile, the basal branches not clearly elevated from the distalmost leaf pair on the flowering shoot and appearing as if they originate from the ultimate leaf axils, 6–9 cm long, 11–18 cm across, main axis branched to 4–5 orders, with 5–6 tiers of branches; lowest branches typically 2.5–7 cm long. **Flower** pedicel (above the ultimate bracteole) 0.5–1 mm long; **calyx** (from the base to the lobe apices) 2–3 mm long, calyx cup 1.5–2 mm wide; **corolla** salverform; cream to white; corolla tube 4–6 mm long, not conspicuously flared, 1–1.5 mm wide, inside glabrous to minutely papillate; corolla lobes ovate to lanceolate, 2.5–3 mm long, 1–1.5 mm wide; **stamens** with filaments 8–11 mm long in the open flower; anthers oblong, c. 1 mm long; **style** 9.5–12 mm long in the open flower; **stigma** knob-like, c. 0.5 mm across, lobes 2, inconspicuous. **Fruit** when mature to 3.5–5 mm across; fruit calyx lobes c. 1 mm long and wide. **Seeds** c. 1 mm across.

Distribution. So far known only in the NW Borneo area (Sabah and Sarawak).

Habitat. In sub-montane to lower montane forest.

Specimens examined: BORNEO. **Sabah.** Ranau, Mamut, copper mine, *Beaman 9962* (K, MSC), copper mining area, *Aban SAN 50747* (holo SAN; iso A), Kinabalu N.P., Bundu Tuhan view trail, *Aban SAN 49430* (SAN), Mt Kinabalu, *Puasa 3506* (K). **Sarawak.** Bt. Sadok, base camp, *Banyeng & Ilias S. 45043* (K, KEP, L, MO, SAN, SAR), summit, *Banyeng & Ilias S. 45059* (K, KEP, L, MO, SAN, SAR); Anap, (Kana) trig point, Bt. Naoung, *Banyeng S. 19401* (A, BO, K, KEP, L, MEL, SAN, SAR, SING); Bintulu, Merurong plateau, *Brunig S. 8791* (K, SAR); Kuching, Matang, Kubah N.P., Gunung Serapi, *Lee S. 54146* (K, SAR), 755 m, *Rantai S. 74271* (SAR, SING), Mt Mike, *Low LYW 260* (KLU); Mt. Dulit, *Richards 1735* (K), Ulu Koyan, *Synge 1874* (K).

3. *Picroploesus javanensis* Blume, Bijdr. Fl. Ned. Ind. (1826) 1020; Don, Gard. Dict. 4 (1837) 66; DC., Prod. 9 (1845) 32. — *Fagraea picroploea* Blume, Rumphia 2 (1838) 36, *nom. illeg.*, Mus. Bot. 1 (1850) 173; Miq., Fl. Ind. Bat. 2 (1857) 377; Merr., J. Str. Br. Roy. As. Soc. Sp. No. (1921) 492. LECTOTYPE (Wong & Sugumaran 2012): *Blume, s.n.*, Java (L: 908.127-201, barcode L0005006).

Cyrtophyllum speciosum Bl., Bijdr. (1826) 1022; DC., Prod. 9 (1845) 31; Ridl., Fl. Malay. Pen. 5 (1925) 322. — *Fagraea speciosa* (Bl.) Bl., Rumphia 2 (1838) 35, t. 81; Mus. Bot. 1 (1850) 172; Bentham, J. Linn. Soc. Bot. 1 (1857) 100; Merr., J. Str. Br. Roy. As. Soc. Sp. No. (1921) 493; *non sensu* Ridl., J. Str. Br. Roy. As. Soc. 50 (1908) 122 (= *C. fragrans*). TYPE: *Blume 1867*, Java (iso L: sheet no. 908.127-210).

Cyrtophyllum speciosum Ridl. var *montanum* Ridl., Fl. Malay. Pen. 5 (1925) 322. TYPE: *Henderson SFN 10992*, Pahang, Cameron Highlands, Gunung Terbakar, 45000 ft. alt., 9 vi 1923 (holo K; iso SING).

Fagraea kimangu Blume, Mus. Bot. 1 (1850) 173. TYPE : *Blume*, Java, *kimangle*, *kimangu* (holo L: sheet no. 908.127-507).

F. valida Miq., Fl. Ind. Bat. 2 (1857) 376. TYPE: *Junghunh*, Sumatra, “Panoadjih et Koeta tinggi” (holo L: sheet no. 908.127-625).

F. sumatrana Miq., Fl. Ind. Bat. 2 (1857) 377. TYPE: *Teysmann HB 992*, Sumatra, Payakombo, “kajoe sobo” (holo U: barcode U0003707; iso L: sheet no. 908.127-628).

F. aurantiadora S. Moore, J. Bot. 66 (1928) 105. TYPE: *Brass 642*, Papua New Guinea, Sogere (holo BM, iso K).

F. pseudoelliptica Kanehiro & Hatusima, Bot. Mag. Tokyo 56 (1942) 161, f. 5. TYPE: *Kanehira-Hatusima 12577*, New Guinea, Ayerjat, along Boemi River, about 40 km inland from Geelvink (holo TKU; iso A).

F. pusilliflora Bakh.f. in Backer, Bekn. Fl. Java 7 (1948) fam. 170, p. 13, *nom. nud.*, Blumea 6 (1950) 383. TYPE: *Endert 77E.1P.746*, Sumatra, Palembang (holo L: sheet no. 923.157-1391).

Fagraea elliptica *auctt.*: Miquel, Fl. Ind. Bat. 2 (1856) 376; Koorders & Valetton, Bijdr. 9 (1903) 84; Cammerloher, Bull. Jard. Bot. Btztg. III, 5 (1923) 316; Leenhouts, Fl. Males. I, 6 (1962) 303; Back. & Bakh. f., Fl. Java 2 (1965) 211; Kochummen, Tree Fl. Malaya 2 (1973) 272; Ashton, Manual Non-Dipt. Trees Sarawak 2 (1988) 314; Wong & Sugau, Sandakania 8 (1996) 21; *quoad F. speciosa* Blume, *Cyrtophyllum speciosum* Blume, *F. picrophloeus* Blume & *Picrophloeus javanensis* Blume in syn.; Anderson, Check List Trees Sarawak (1980) 239 *pro parte*.

[*Fagraea elliptica* Roxb. *sensu stricto*, Fl. Ind. ed. Wall. 2 (1824) 32, Fl. Ind. ed. Carey 1 (1832) 462, DC., Prodr. 9 (1845) 30, *nom. dub.*; *Willughbeia elliptica* (Roxb.) Spreng., Syst. Veg. 4 (1827) Cur. Post. 71, *nom. dub.*]

Tree, sometimes to 3–4 m tall but more often bigger, to 10–20 m tall; trunk to about 1 m diameter; **bark** fissured in younger trees, less conspicuously so and dippled-scaly

in older trees, grey-brown to dark brown. **Leaves** elliptic; (8–)11–17(–21) cm long, (3–)4–7(–9.5) cm wide; base cuneate; apex acuminate to short-caudate, 1–3 mm long; margin plane when fresh (in dried specimens sometimes slightly wavy); thin-coriaceous; upper and lower surfaces smooth; midrib prominent below; secondary veins (5–)7–12 pairs, upper side faint and immersed in the blade, lower side faint to very slightly prominent; tertiary veins inconspicuous; petioles (0.5–)1–1.5(–2.2) cm long, stout. **Inflorescence** sessile, the basal branches not clearly elevated from the distalmost leaf pair on the flowering shoot and appearing as if they originate from the ultimate leaf axils, (6–)7–10(–12.5) long, 10–20 cm across, main axis branched to 4–5 orders, with 4–5 tiers of branches; lowest branches (3.5–)4–10 cm long. **Flower** pedicel (above the ultimate bracteole) 1–2 mm long; **calyx** (from the base to the lobe apices) 1.5–2 mm long, calyx cup 1.5–2 mm wide; **corolla** salverform; cream to white; corolla tube 4–6 mm long, not conspicuously flared, 0.8–1 mm wide, inside glabrous to minutely papillate; corolla lobes 2.5–3.5(–4) mm long, 0.8–1 mm wide; **stamens** with filaments 7–8 mm long in the open flower; anthers oblong, 1–1.2 mm long; **style** 7–14 mm long in the open flower; **stigma** knob-like, c. 0.5 mm across, lobes 2, low and rounded, parting to present two slightly raised, hemispherical, papillate inner surfaces when receptive, not recurving. **Fruit** when mature to 4–5 mm across; fruit calyx lobes up to c. 1 mm long and wide. **Seeds** 0.5–1 mm across.

Distribution. Sumatra, Java, Malay Peninsula, Borneo, Moluccas, New Guinea.

Habitat. Lower montane forest, but in the Wallacea region also in the lowlands, including coastal forest.

Specimens examined: BORNEO. **Kalimantan.** Sampit, *Kostermans 4663* (SING). **Sabah.** British North Borneo, *Villamil 251* (SING); Mamut Coppermine area, *Postar et al. SAN 147993* (SAN); Mt. Kinabalu, Eastern Shoulder, *Chew, Corner & Stainton 3* (SING).

JAVA. *Blume s.n.* (lecto L: 908.127-201, barcode L0005006), *Blume s.n.* (L: 908.127-507), *Blume 1867* (L: 908.127-210, barcode L0005005). **G. Salak.** 600–1000 m, *Koorders 24247β* (BO), *24461β* (BO), *36689β* (BO). **Preanger.** Tjibodas, 1400 m, *Koorders 42825β* (BO), *40154β* (BO).

MOLUCCAS. **Amboina.** *Robinson 2037* (BO, SING); Boeroe, 300 m, *Neth. Ind. For Service bb 22839* (SING). **Ceram.** 40 km E of Masohi in Wae Ruatan / Wae Ruwata (Ruwa) catchment areas, *Burley, Tukirin & Ismail 4335* (A, BO, K, SING); Kp. Kiandarar, G. Kilia, *Buwalda 5592* (SING). **Halmahera.** Taso-a-Gunung Sembilan, 300 m, *Pleyte 264* (SING). **Morotai.** Mt. Songawo, *Main et Aden 1025* (SING). **Sulabes (Sanana).** Kabauw, 150 m, *Neth. Ind. For Service bb 28875* (SING).

NEW GUINEA. **Ayerjat.** Along Boemi River, about 40 km inland from Geelvink, *Kanehira-Hatusima 12577* (A, TKU). **Mimika Regency.** PT-Freeport Indonesia Concession Area, *Utteridge et. al. 458* (SING). **Morobe.** Markham Point, *Womersley & Henty NGF 11681* (SING); Patep, 2300 ft, *Millar NGF 9970* (SING). **Milne Bay.** Rabaraba, junction of Mayu & Ugat River, *Katik, LAE 56309* (SING). **Sepik.** Aitape Subdistrict, along Bliri River, *Darbyshire & Hoogland 8338* (SING); West Sepik District, Telefomin Subdistrict, Prospect Creek near Freida River, *Henty & Foreman NGF 42535* (SING), *NGF 42580* (SING). **Sogere.** *Brass 642* (BM, K). **Wissel Lake Region.** *Eyma 4425* (SING).

PENINSULAR MALAYSIA. **Kedah.** Kuala Muda, Gunung Jerai, *Whitmore FRI 20443* (SING); Jerai F.R., *Abdullah & Motan 73515* (KEP), *Gurun 66405*, leafy branch only (KEP), plantation Jerai, *Gurun 59647* (KEP, SING); Kedah Peak, *Kochummen KEP 94404* (KEP). **Kelantan.** Sungai Keleh, *Henderson 19658* (KEP, SING). **Pahang.** Cameron Highlands, Boh Plantations, *Mohd Nur SFN 32626* (KEP, SING), Gunung Brinchang, *Teo et al., KL 4694* (KEP), Gunung Terbakar, *Henderson SFN 10992* (K, SING), *SFN 31385* (KEP), *Holttum SFN 31385* (SING), *Symington KEP 36219* (KEP, SING); Fraser's Hill, Kiew & Anthony *RK 3483* (SING), Kenari Trail, *Kiew 3335* (KEP); Gunung Tapis, *Chan YC FRI 19906* (KEP, SING); Ulu Kali, *Low LYW 358* (KLU), *Stone 15420*, leafy branch only (KLU).
 SUMATRA. *Achmad 58* (SING), *1515* (SING), *1616* (SING), *Batten s.n. 1940* (SING), *Forbes 3142* (SING); *Yates 2201* (SING); Habinsaran oso. vom Tobasee 1200–1300 m, *Lörzing 6568* (BO). **Asahan.** Loemban Ria, *Rahmat 7352* (SING), *7813* (SING), *7952* (SING), *7962* (SING). **Palembang.** *Endert 77E.1P.746* (L); Lematang Ilir, Semangoes, *Neth. Ind. For Service bb. 31728* (SING), *bb. 31747* (SING), *bb. 32122* (SING); Tjaban F.R., near Muara Enim, *Kostermans 12049* (SING). **Panoadjih & Koeta Tinggi.** *Junghunh s.n.* (L). **Payakombo.** *Teysmann HB 992* (L, U). **Si borong borong.** *Stein Ba/9/73/7* (SING).

Fagraea elliptica Roxb. is a dubious name that has often been applied to the taxon referred to here. This was a name first used in the *Hortus Bengalensis* of Roxburgh (1814) without any description (*nomen nudum*), and later only briefly described in Roxburgh (1824) (*Flora Indica* ed. Wall. 2: 32), highlighting the “terminal corymbs” in this species, in contrast to much more detailed descriptions for other species he described in *Fagraea* in the same work. He also did not definitely state a locality, merely mentioning “native of the Moluccas”.

Roxburgh's unusually brief description for his *F. elliptica* may imply that there were no specimens immediately available to him and that he was awaiting material from the Moluccas collected either by his son (also William Roxburgh) or by Christopher Smith, a less-than-fully compliant nurseryman under Roxburgh Senior's direction but who seemed interested in succeeding him at the Calcutta Botanic Garden (Royal Botanic Gardens Kew 2006, Steenis-Kruseman 1958), or even someone else. The sheets in Kew, where much of Roxburgh's collection is kept, do not include *F. elliptica* collections made from the Moluccas earlier than 1824 which Roxburgh (who died in 1815) or Carey (who edited the first publication of the *Flora Indica*, with two volumes published in 1820 and 1824) or Wallich (whose taxa included in these first volumes were clearly marked as his additions) could have seen. Neither are there any found in the Edinburgh, Geneva, Linnean Society of London, Natural History Museum (London), and Paris herbaria where also Roxburgh material may be found (Forman 1997). Smith collected in the Moluccas between 1796 and 1805 (John Hunnux, Natural History Museum (London), pers. comm.) but we have managed to determine that these collections do not include *F. elliptica*.

There is also no drawing of this taxon among Roxburgh's *Flora Indica* illustrations at Kew (Sealy 1957). The British Museum has a number of drawings that had belonged to Patrick Russell (Roxburgh's friend), and John Fleming (one of Roxburgh's collaborating botanists), but none of these are marked by Roxburgh numbers (Royal Botanic Gardens Kew 2006). At the Library of the Natural History

Museum (London), John Hunnax has managed to locate a painting (in a series of some 180 drawings of plants from the region made by Smith before his death in 1807) that greatly resembled specimens which had been determined as *F. elliptica*. Although this plant is depicted with the same leafy branch habit, terminal inflorescence and floral and other dimensions that suitably represented such *F. elliptica* specimens, the included drawing of a dissected mature corolla tube clearly displays tiny stamens with short anthers inserted on the inner surface of the tube and completely included within. This totally contrasts with *F. elliptica* specimens available generally that had conspicuously long-exserted stamens far exceeding the corolla tube. Was this perhaps a preliminary representation of what Roxburgh had wanted to include but did not do so satisfactorily because details such as the nature of the stamens were still to be confirmed? The rather bright red colour used for the anthers in this painting is unrepresentative for this alliance of plants (in which anthers were typically yellow turning brown, without a red phase), suggesting it may have needed to be specially highlighted.

The description of *F. elliptica* in Roxburgh (1824) is conspicuous by its brevity, hardly three lines in all, omitting mention of the stamens, and not discussing any collection, merely mentioning the Moluccas as a provenance. In contrast, the description of the preceding taxon in the same work, *F. fragrans*, is detailed, including mentioning the exserted stamens, and gives the provenance and a collection number clearly. The later Carey edition of the *Flora Indica* (Roxburgh 1832, vol. 1: 462), repeats the same brevity for *F. elliptica*. In his *Prodromus*, De Candolle (1845: 30 & 32) enumerates both *F. elliptica* Roxb. as well as *Picrophloeus javanensis* Blume, which he was evidently unaware could be synonymous. Candolle notes thus on his page 30:

“13. *F. elliptica* (Roxb. fl. ind. ed. 1824. v.2 p.32), caule..., foliis breviter petiolatis lato-ellipticis laevibus firmis, corymbis terminalibus supra decompositis, corollae tubo cylindrico. in Moluccis. Caet. ign.”

The final notation (Latin: *Caetera ignota* = all the rest unknown) is a telling sign that, decades afterwards, the details of *F. elliptica* had remained enigmatic. By the time of the *Flora of British India* (Clarke in Hooker 1883), this taxon was not enumerated anymore. However, Miquel (1856) still adopted the name *F. elliptica*, with *F. speciosa* Blume (published in 1838) as a synonym, and also enumerated the now-illegitimate *F. picrophloeus* Blume (based on *Picrophloeus javanensis*), providing these names that Malesian botanists then attempted to account for in their region. These names were later accepted by Leenhouts (1962) as synonymous, with *F. elliptica* Roxb. the earliest correct name.

The unsuccessful searches among the various herbaria for specimen material that could be specially related to the brief and uninformative description of *F. elliptica* in Roxburgh (1824), the continuing inability among interested scholars to provide a better description in the decades following this, and the existence of a Smith painting wherein an important discrepancy exists for the very feature that was omitted in the Roxburgh descriptions, must, unfortunately, imply that Roxburgh and his editors were greatly hampered by availability of material and lack of familiarity with this taxon. Here we take the view that *F. elliptica* Roxb. represents a dubious name that cannot be

reasonably ascribed a type specimen from possibly original material. Instead, there is much advantage in employing *P. javanensis* Blume as the correct name for the taxon we intend here, because it is also assigned to the genus name most appropriate to its taxonomy and was validly published in 1826 (just two years following the appearance of *F. elliptica* in Roxburgh's *Flora Indica*), when for years later even Roxburghian scholarly circles could not resolve the enigmatic aspects of *F. elliptica*. Even if familiarity could be claimed for using *F. elliptica* Roxb. in the sense of *P. javanensis*, the former name would still need to be neotypified and a new name combination made in *Picrophloeus*, both of which could be highly contentious propositions.

4. *Picrophloeus rugulosus* (K.M.Wong & Sugau) K.M.Wong, **comb. nov.** — *Fagraea rugulosa* K.M.Wong & Sugau, Sandakania 8 (1996) 22. TYPE: *Chai & Ilias S. 27929*, Sarawak, 5th Division, Ulu Lawas, Telau, Kota F.R. near Sg. Telau (holo SAN; iso A, BO, K, KEP, L, SAR, SING).

F. elliptica *auctt.*: Leenhouts, Fl. Males. I, 6 (1962) 303 *pro parte*; Cockburn, Trees of Sabah 1 (1976) 210 *pro parte*; Ashton, Manual Non-Dipt Trees Sarawak 2 (1988) 314 *pro parte*; Anderson, Check List Trees Sarawak (1980) 239 *pro parte*. [*Fagraea elliptica* Roxb. *sensu stricto*, Fl. Ind. ed. Wall. 2 (1824) 32, *nom. dub.*]

Tree, to around 15 m tall; trunk to c. 25 cm diameter; **bark** lightly fissured, dark brown. **Leaves** elliptic-obovate; 11–21 cm long, 5–9 cm wide; base cuneate; apex acute; margin recurved when dry; coriaceous; upper and lower surfaces coarsely shagreen; midrib prominent below, rounded or ridged; secondary veins 9–12 pairs, on both sides faint to obscure; tertiary veins obscure; petioles 2–3.5 cm long, stout. **Inflorescence** distinctly pedunculate (its basal branches distinctly elevated from the ultimate leaf pair), to c. 6 cm long, c. 15 cm across, main axis branched to 3–4 orders, with (3–)4–5 tiers of branches; peduncle 1–1.5 cm long; lowest branches typically 2.5–6 cm long. **Flowers** sessile (the ultimate floral bracteole immediately below the calyx cup); **calyx** (from the base to the lobe apices) 3–4 mm long, calyx cup 2–3 mm wide; **corolla** salverform; cream to white; corolla tube 8–10(–11) mm long, not conspicuously flared, 1–1.5 mm wide, inside glabrous to minutely papillate; corolla lobes 4.5–6 mm long, 2–2.5 mm wide; **stamens** with filaments 15–18 mm long in the open flower; anthers oblong, c. 1 mm long; **style** (18–)22–25 mm long in the open flower; **stigma** knob-like, c. 0.5 mm across, lobes 2, inconspicuous. **Fruit** when mature to 6–9(–10) mm across; fruit calyx lobes 2–2.5 mm long and wide. **Seeds** c. 1 mm across.

Distribution. So far known only in, and probably endemic to, the Brunei region (SW Sabah, Brunei and NE Sarawak).

Habitat. Primary *kerangas* and lowland mixed dipterocarp forest up to c. 450 m.

Specimens examined: BORNEO. **Brunei.** Belait, Andulau F.R., *Ashton BRUN 628* (BRUN, K,

SING), Andulau Compartment 8, *Wood, Smythies & Ashton SAN 17521* (BRUN, K, SING); Belait, Bukit Puan, *Ashton BRUN 637* (BRUN, K, SING), Sukang, Sungei Kuant, Ulu Belait, *Salleh et al. BRUN 15338* (SING), Sungai Liang, at Ulu Sungai Lumut, *Niga et al. BRUN 15216* (SING); Belait, Teraja, Wasai Wong Kadir, *Ariffin et al. BRUN 15161* (SING); Belait, source of the Sg. Ingei north of Batu Patam, *Wong WKM 1104* (BRUN, K, SING); Ulu Belait, R. Topi, *Ashton BRUN 214* (BRUN, K, SING); Temburong, Temburong River, just upstream from Wong Nguan gorge, *Wong WKM 1702* (BRUN, K, SING), just upstream from Wong Nguan rapids, *Coode 6539* (BRUN, K); Tutong, Bt. Bahak, near LP 338A, *Coode 7029* (BRUN, K); Tutong, Kampong Bukit Beruang, *Niga & Clayton BRUN 15450* (SING); Tutong, Ladan Hill F.R., *Ariffin et al. BRUN 18078* (SING). **Sabah.** Beaufort, Papar-Beaufort road, mile 16.5, *Lajangah SAN 32270* (SAN); Sipitang, Sri Beaufort Area, *Dewol SAN 80111* (KEP, SAN, SAR, SING). **Sarawak.** Baram, G. Mulu N.P., Ulu Sg. Berar, *Chai S. 39595* (A, KEP, L, MO, SAN, SAR), Melinau Gorge (4°10'N, 114°55'E), 1000 ft, *Chew CWL 442* (K, SING), *Ilias S. 16603* (A, BO, K, L, SAN, SAR, SING), near Gunong Api (4°7'N, 114°55'E), 1000 ft, *Chew CWL 1172* (K, SING); Miri, Lambir, proposed N.P., *Awang Morshidi S. 24094* (K, L, SAR, SING), Lambir Hills, *Ilias S. 16603* (SAR, SING); Ulu Lawas, Kota F.R., near Sungai Telau, *Chai & Ilias S. 27929* (holo SAN; iso A, BO, K, KEP, L, SAR, SING).

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