BLUMEA 42 (1997) 489–498

A REVISION OF CARRUTHERSIA SEEMANN (APOCYNACEAE)

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SUMMARY

The genus *Carruthersia* is revised. Three species are recognised. The species are described and a key is presented.

INTRODUCTION

This work has been carried out as part of a series of revisions of Asian and Pacific Apocynaceae, subfamily Apocynoideae, primarily towards completing an account of the family for Flora Malesiana. *Carruthersia* is one of the smaller genera in this series but, nevertheless, not without interest primarly due to the widespread nature of one of the species.

The genus *Carruthersia* was first described in 1866 by Seemann from specimens collected in Fiji. There was only the one species until Fernandez-Villar (1880) transferred the Philippine species *Kopsia pilosa* A.DC. to *Carruthersia*. After this a number of species were described from the Philippines, the Solomon Islands and Fiji. Surprisingly no specimens have ever been found between the Solomon Islands and the Philippines although it is hard to imagine that the genus is completely absent from New Guinea. Rolfe (1883) discussed the genus in Fiji and noted that the fruit illustrated by Seemann in the original description actually belonged to a *Melodinus*. He also noted that there may be more than just the one species, *C. scandens*, in Fiji.

The position of *Carruthersia* within the Apocynaceae has been somewhat changeable. Bentham & Hooker (1876) placed it in their tribe III, Echitideae (= Apocyneae in modern nomenclature), subtribe Ichnocarpeae (= Ichnocarpinae). Schumann (1895) maintained *Carruthersia* in subfamily Echitoideae (= Apocynoideae) and placed it in tribe Echitideae. Pichon (1948, 1950) removed it from subfamily Apocynoideae and placed it in subtribe Holarrheninae, tribe Alstonieae of subfamily Plumerioideae. He allied it to *Holarrhena* and *Spirolobium*. The reason for the ambiguity over the position of this genus is due to the fact that the stamens are not strongly adnate to the pistil as is usual in the Apocynoideae. The shape of the anthers is also more reminiscent of the Plumerioideae. However, the dextrorse aestivation of the corolla lobes and the structure of the fruit and seeds are very like the other genera of Apocynoideae. The most comprehensive study into the position of *Carruthersia* within the Apocynaceae was conducted by Endress et al. (1990). They examined floral structure, pollen mor-

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phology and alkaloid chemicals and concluded that Holarrheninae is an unnatural subtribe and that its three constituent genera should be placed back in the Apocynoideae. They reported that the stamens are indeed adnate to the pistil by means of an annular brush matted together with pollen transport adhesive. They also reported that the pollen grains are polyantoporate, possibly relating it to *Vallariopsis*, a close relationship I personally find unlikely and more likely due to convergence. Alkaloid data were not available for *Carruthersia*. Leeuwenberg (1994), in his system for the whole of the Apocynaceae, placed *Carruthersia* in tribe Wrightieae, subtribe Alafiinae along with *Holarrhena, Alafia* and *Farquharia*.

One of the striking features in the genus is the apparent occurrence of species pairs based more or less solely on indumentum: *C. pilosa/C. macgregorii, C. mollis/C. brassii* and *C. latifolia/C. macrantha*. I have now synonymised the first four into *C. pilosa* and the latter two together. In each case the apparent difference breaks down, the hairy form simply being at the extreme. The hairy forms may be an adaptation to high altitude, one of the collections of *C. mollis* from Bougainville having been collected at over 2300 m. Unfortunately altitudinal data are not given often enough on herbarium specimens to make firm predictions on this. The three species recognised are still remarkably similar differing primarily in the shape of the leaves and size of the flowers.

The genus has an interesting distribution. One species is found in the Philippines and the Solomon Islands but has not been collected in New Guinea (except for Bougainville which is part of the Solomon Islands chain) and the other two species are in Fiji and Tonga. Smith (1988) reports that the genus also occurs in the New Hebrides (= Vanuatu) but I have found no specimens from there.

MATERIALS AND METHODS

Herbarium material was studied from the following herbaria: A, B, BISH, BM, BO, BP, BR, BRI, C, E, G, G-DC, GH, K, L, M, MEL, MO, NSW, NY, P, S, SING, TCD, U, UPS, US, W, Z (Holmgren et al., 1990). All specimens cited have been seen unless otherwise stated.

The dimensions given in the descriptions are for dried material except for the gynoecium and androecium characters which are for flowers rehydrated with water.

SYSTEMATIC TREATMENT

CARRUTHERSIA

Carruthersia Seem., Fl. Vitiensis (1866) 155; Benth. & Hook. f., Gen. Pl. 2 (1876) 718; K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. 4, 2 (1895) 174; Pichon, Mém. Mus. Natl. Hist. Nat. sér. B, Bot. 1 (1950) 158. — Type species: *Carruthersia scandens* Seem.

Woody climbers, producing white latex. Branches terete, lenticellate or not; branchlets terete, puberulent to glabrous. *Leaves* opposite, those of a pair equal, petiolate; bases of petioles usually joined in an inconspicuous ring around the branch, with colleters in the axils. Blade papery to coriaceous, entire, midrib impressed above and

prominent beneath; nerves anastomosing before margin; tertiary venation scalariform and/or reticulate. *Inflorescences* of axillary and terminal cymes, often forming a terminal panicle, glabrous or puberulent, lax; bracts small and ovate. *Flowers* 5-merous, actinomorphic, often fragrant. *Sepals* free, entire, with a row of colleters at the base. *Corolla* consisting of a long tube and spreading lobes; tube slightly wider near the base where the anthers are located and widening again slightly just before the top; lobes in bud overlapping to the right, falcate in mature flower. *Stamens* seemingly free but actually very loosely adnate to pistil head, inserted near base of corolla tube; filaments filiform; anthers introrse, oblong, base shortly sagittate, apex mucronate, fertile most of length except at very base and apex, 2-celled, dehiscent by a longitudinal slit. *Disc* of 2 separate ovate or oblong lobes alternate with the carpels. *Ovary* of 2 separate carpels united into a common style, glabrous, ovules many, pistil head fusiform with a sterile pointed apex. *Fruit* of paired follicles, fusiform to terete, pointed at ends, somewhat laterally flattened, longitudinally dehiscent, many-seeded. *Seeds* elliptic with a coma pointing towards fruit apex, grain slightly elongated at end with coma.

Distribution — Philippines, Solomon Islands, Fiji, Tonga.

KEY TO THE SPECIES

1a. Corolla tube 6.8–11(–14) mm long. — Philippines and Solomon Islands ..... **2. C. pilosa**
b. Corolla tube 13.5–35 mm long. — Fiji and Tonga 2
2a. Leaves ovate to elliptic, 1.1–2.1 × as long as wide; 5–8 pairs of lateral nerves; pedicels robust, 2.7–7(–10) mm long ..... **1. C. latifolia**
b. Leaves elliptic, 2.1–3.9 × as long as wide; 7–12 pairs of lateral nerves; pedicels delicate, 5.5–31 mm long ..... **3. C. scandens**

1. **Carruthersia latifolia** Gillespie — Fig. 1

Carruthersia latifolia Gillespie, Bish. Mus. Bull. 74 (1930) 18, f. 22; A.C. Sm., Fl. Vit. Nov. 4 (1988) 79. — Type: *Gillespie 4656* (BISH holo; B, BO, K, P, US iso), Fiji, Taviuni, vicinity of Wairiki.

Carruthersia macrantha A.C. Sm., Fl. Vit. Nov. 4 (1988) 80; syn. nov. — Type: *DA (Ledua) 11029* (BISH holo; BRI iso), Fiji, Viti Levu, Ra Province, Ndakuivuna.

Branchlets mostly glabrous or pubescent around nodes, rarely to densely tomentose. *Leaves:* petioles 0.9–5 cm long; blade ovate to elliptic, apex short acuminate to obtuse, base cordate to rounded, 2.8–25.6 × 2–15.6 cm, 1.1–2.1 × as long as wide, 5–8 pairs of lateral nerves, glabrous, sparsely pubescent on midrib and nerves or velutinous beneath. *Inflorescences* axillary and, sometimes, terminal often forming panicles, glabrous to tomentose, 5.5–14.5 cm long; pedicels 2.7–7(–10) mm long. *Sepals* ovate to oblong, rounded to obtuse, 1.6–2.7 × 0.6–1.4 mm, 1.2–4 × as long as wide, glabrous to sparsely puberulent, ciliate to eciliate. *Corolla* white, sometimes reddish at base; tube 13.5–35 mm long; lobes 9–19 mm long, 0.4–1 × as long as tube, 4.2–14 mm wide, 1.3–3.7 × as long as wide; lobes usually ciliate in bud, glabrous to pubescent outside, pubescent inside. *Stamens* inserted at 2.5–4.7 mm from

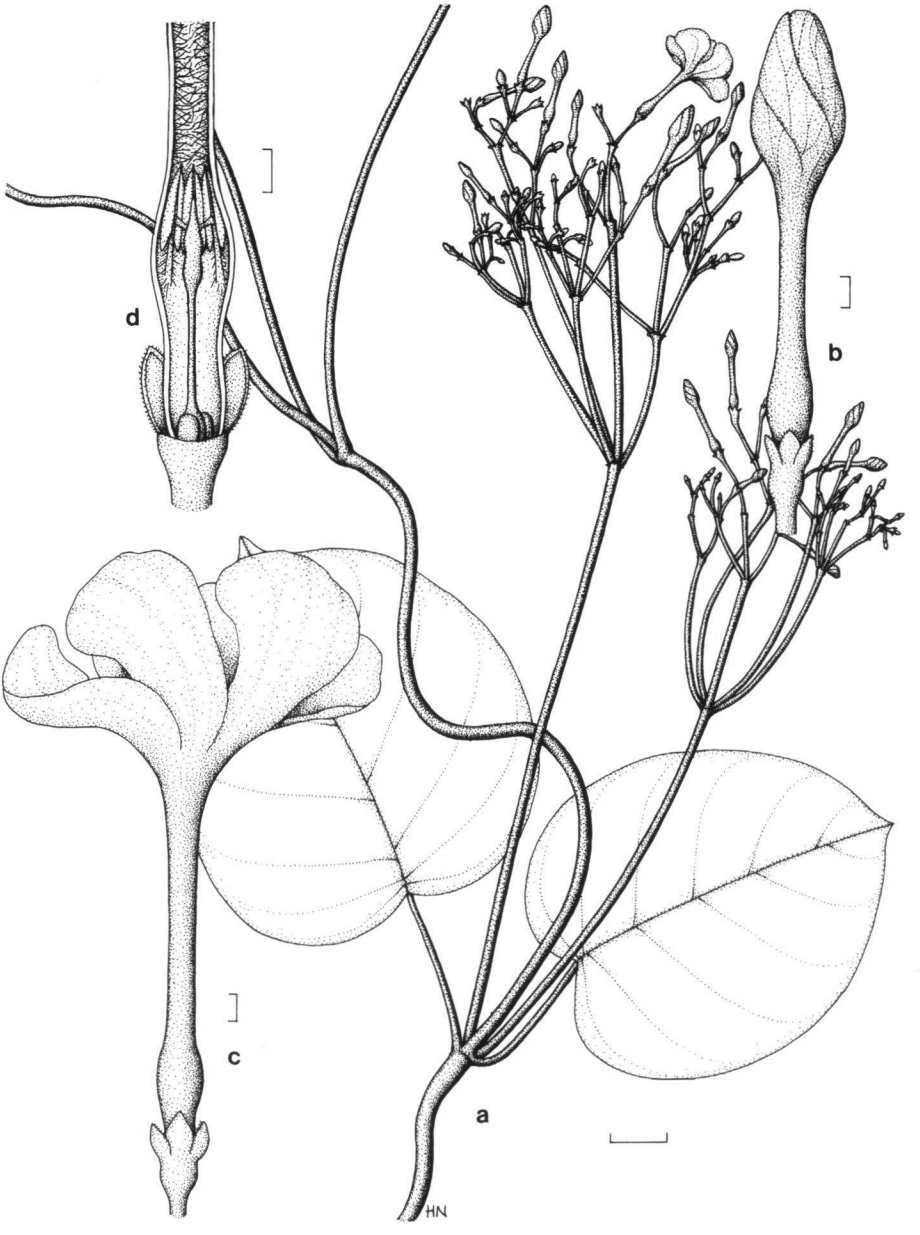

Fig. 1. *Carruthersia latifolia* Gillespie. a. Habit; b. flower in bud; c. open flower; d. Flower dissection (a–d: *Smith 6797*). Scale bars = 1 cm in a; 1 mm in b, c, d.

corolla base, which is 0.1–0.2 of tube length; filaments 0.7–1.7 mm long; anthers 2–2.7 × 0.5–0.6 mm, 3.3–5.2 × as long as wide. *Disc* oblong to ovate, flat-topped or rounded, 0.5–1 mm long. *Ovary* 0.5–1.1 mm long; style + pistil head 3.3–5.9 mm long. *Fruit* glabrous, 14–20.5 cm long, 6.5–9.5 mm wide. *Seed* grain 15.4–17 × 2.5–3.1 mm; coma 2.7–3.8 cm long.

Distribution & Habitat — Fiji and Tonga, growing in forest or at the edge of forest to 900 m. Much of the material gives no altitudinal data and the pubescent forms may grow at higher altitude.

Note — This species is close to *C. pilosa* from which it differs in its larger flowers and generally less acuminate leaves.

Collections studied:

FIJI. s.l., *Thurn 114* (K, P), *Joske s.n.* (K), *Seemann 315* (K). – Ovalau: *Graeffe 1587* (K). – Rambi: *Horne 460* (GH, K). – Taveuni: vicinity of Wairiki, *Gillespie 4656* (B, BISH, BO, K, P, US - type of *Carruthersia latifolia*); western slope between Somosom & Wairiki, *Smith 844* (B, BISH, BO, GH, K, NY, P, S, US). – Vanua Levu: Mathuata coast, *Greenwood 639* (BRI, K); southern base of Mathuata Range, N of Natua, *Smith 6797* (A, BISH, BRI, K, L, NY, P, S, US); Mbua, *Holmes s.n.* (K); Mbua, southern portion of Seatovo range, *Smith 1522* (B, BISH, K, NY, P, S, US); Mbua, Upper Ndama River valley, *Smith 1697* (B, K, NY); Thakauandro, Latiki, Track to Mt Nasorolevu, Savusavu, *Koroiveibau & Vodonaival 17168* (BRI, K); Thakauandro, Nasuvasuva, Hills S of Nakula Valley, *Smith 356* (B, BISH, BO, GH, K, NY, P, S, US). – Viti Levu: s.l., *Horne 967* (GH, K), *Horne 89* (K); Nadala near Nadarivatu, *Degener & Degener 32021* (BISH, NY); Namosi, Nakavika, *Koroiveibau 11626* (BISH); Nandarivatu, *Parks 20678* (BISH, US), *Thurn 121* (BM, K); Nandronga, Singatoka River, *Greenwood 835* (A, K); Suva, *Yeoward 68* (K, MEL); Tholo West, Mbuyombuyo, near Namboutini, *Degener 15504* (A); Serua, Hills between Navua River and Wainiyavu Creek, near Namuamua, *Smith 8973* (BISH, US); Ra province, Ndakuivuna, *Ledua 11029* (BISH, BRI - type of *Carruthersia macrantha*).

TONGA. 'Eua: along central ridge S of Soti, *Buelow 2331* (BISH).

2. Carruthersia pilosa (A.DC.) Fern.-Vill. — Fig. 2

Kopsia pilosa A.DC., Prodr. 8 (1844) 352. — *Carruthersia pilosa* (A.DC.) Fern.-Vill., Novis. App. (1880) 137; Merr., Enum. Philipp. Flow. Pl. 3 (1923) 335. — Type: *Cuming 1783* (G-DC lecto, designated here; BM, K, L, P, W iso), Philippines.

Ellertonia macgregorii Merr., Govt. Lab. Publ. (Philipp.) 35 (1906) 59. — *Carruthersia macgregorii* (Merr.) Merr., Philipp. J. Sci., 3, Bot. (1908) 261; Enum. Philipp. Flow. Pl. 3 (1923) 335; Tsiang, Sunyatsenia 2 (1934) 157; syn. nov. — Type: *Macgregor 285* (K lecto, designated here; K iso), Philippines.

Carruthersia kindleyi Elmer, Leafl. Philipp. Bot. 4 (1912) 1452; syn. nov. — Type: *Elmer 7833* (K lecto, designated here; A, BO, BP, E, L, MO, NSW, NY, US, W, Z iso), Philippines, Luzon, Tayabas Province, Lucban.

Carruthersia brassii Merr. & L.M. Perry, J. Arnold Arbor. 24 (1943) 215; syn. nov. — Type: *Brass 2609* (A holo; BISH, BM, BO, BRI, L iso), Solomon Islands, San Cristobal, Huro River.

Carruthersia mollis Markgr., Gard. Bull. Sing. 22 (1967) 25; syn. nov. — Type: *Whitmore BSIP 2749* (BSIP holo, n.v.; K, L, SING iso), Solomon Islands, Santa Isabel, Bogotu, West of Perega Village.

Branchlets glabrous to densely puberulent and then often interspersed with longer hairs. *Leaves:* petiole 0.6–8.2 cm long; blade ovate, apex acuminate, base cordate to rounded, 2.3–20.6 × 1.1–13.6 cm, 1.1–3.3 × as long as wide, 5–10 pairs of lateral nerves, glabrous to densely velutinous beneath and above. *Inflorescences* of axillary and terminal cymes, often forming panicles, sometimes somewhat umbelliform, gla-

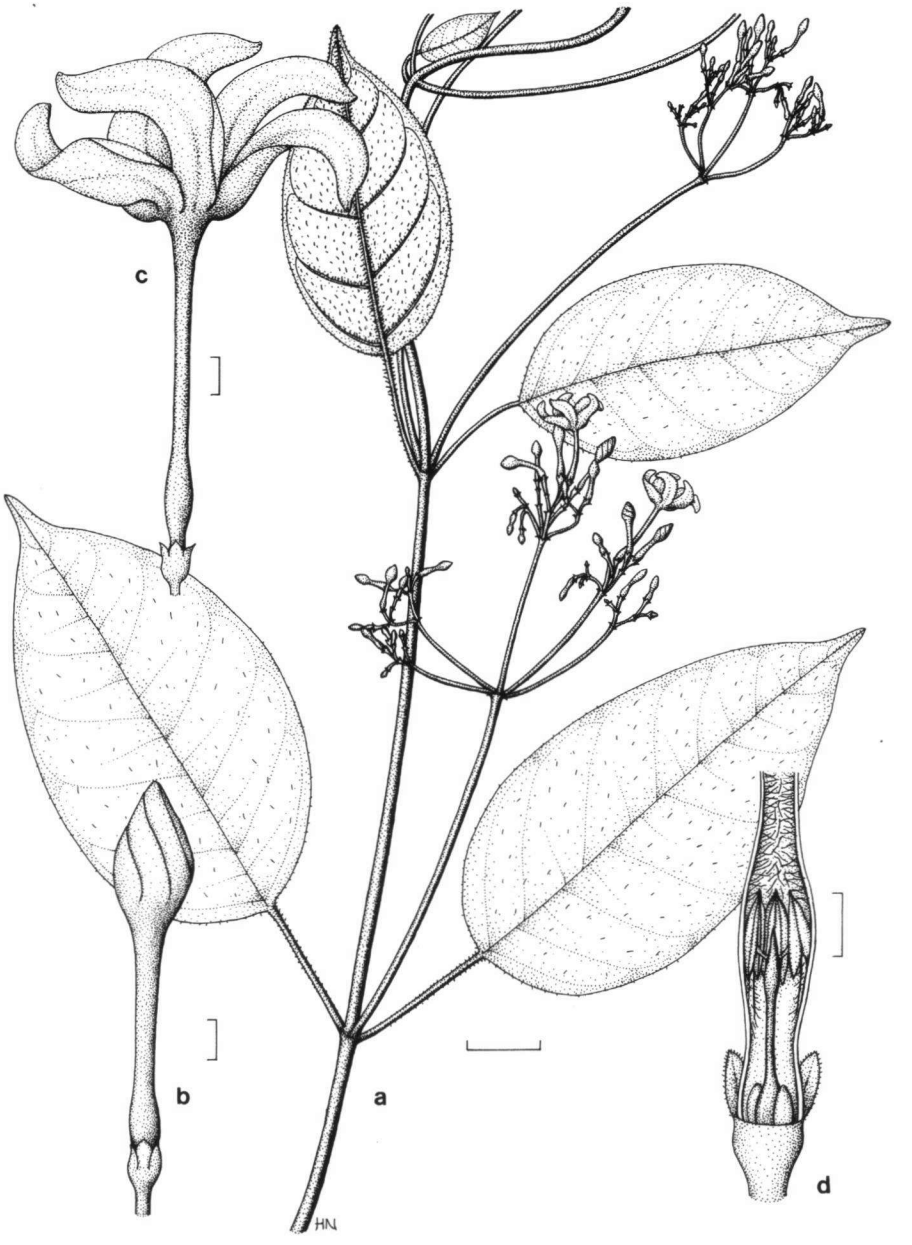

Fig. 2. *Carruthersia pilosa* (A. DC.) Fern.-Vill. a. Habit; b. flower in bud; c. open flower; d. flower dissection (a: *Madulid et al. 952*; b–d: *Craven & Schodde 479*). Scale bars = 1 cm in a; 1 mm in b, c, d.

brous to velutinous, often with longer hairs interspersed, 3.8–20 cm long; pedicels 1.3–10 mm long. *Sepals* ovate to oblong, often with a thick base, apex rounded to obtuse, rarely to acute, 0.6–1.9 × 0.5–1.3 mm, 0.7–2.4 × as long as wide, glabrous to puberulent, ciliate. *Corolla* white or cream to reddish; tube 6.8–14 mm long; lobes 3.2–12.5 mm long, 0.4–1.1 × as long as tube, 2–7 mm wide, 1.5–4.8 × as long as wide; glabrous to puberulent outside, pubescent inside. *Stamens* inserted at 1.1–2.5 mm from corolla base, which is 0.1–0.2 of tube length; filaments 0.6–1 mm long; anthers 1.4–1.8 × 0.3–0.6 mm, 3–6 × as long as wide. *Disc* ovate to oblong, apex obtuse, flat-topped or slightly bifid, 0.3–0.7 mm long. *Ovary* 0.3–0.9 mm long; style + pistil head 1.9–3 mm long. *Fruit* laterally flattened, fusiform, glabrous, 7–13.3 cm long, 1.2–1.7 cm wide. *Seed* grain 17.8–21 × 3.3–3.5 mm; coma 2.8–2.9 cm long.

Distribution & Habitat — Philippines and the Solomon Islands (including Bougainville). Grows in primary and secondary forest to 2400 m altitude.

Note — The Philippine material is quite variable which is possibly what led Elmer and Merrill to describe a number of different species. Merrill (1923) reduced the Philippine taxa to two species, *C. pilosa* and *C. macgregorii*, based largely on the indumentum, an unreliable and continuously variable character. The Solomon Islands material is not essentially any different to the Philippine material except that it is generally more glabrous on the inflorescence. Merrill & Perry's assertion in the original description that the flowers in the Philippine material are smaller does not hold up to examination: there is a large overlap between the two. *Ramos & Edaño 45212* has short few-flowered inflorescences but is otherwise unremarkable. In this it seems close to the description of *C. axilliflora* but in that description the flowers are much smaller.

Collections studied:

PHILIPPINES. s.l., *Cuming 1783* (BM, K, G-DC, L, P, W - type of *Kopsia pilosa*), *Cuming 1785* (M), *Macgregor 285* (K - type of *Carruthersia macgregorii*). – Leyte: Mt Janagdan, Ormoc, *Edaño 12053* (A, BO, L). – Luzon: Abra: Massisiat - Mt Portoc, *Alcasid 1694* (A, L). Bataan: Lamao River, Mt Mariveles, *Meyer 3117* (NY, US). Benguet: *Merrill 9771* (A, BM, BO, BRI, GH, K, L, NSW, NY, P, SING, US). Camarines Norte: Bicol National Park, *Stone et al. 3744* (L). Laguna: *Sulit et al. 31115* (NY, SING, Z). Pampanga: Camp Stotsenberg (Mt Pinatubo), *Elmer 22007* (BM, C, GH, K, MO, NY, P, SING, US, Z), *Elmer 22077* (BO, MO, L). Rizal: Montalban, *Loher 12090* (A, M). Sorsogon: Irosin (Mt Bulusan), *Elmer 15661* (BM, BO, BP, C, GH, K, L, MO, NSW, NY, P, S, U, US, Z). Tayabas: Casiguran, *Ramos & Edaño 45212* (A, B, BM, BO, K, NY, P, US, W); Lucban, *Elmer 7426* (A, BO, BP, E, K, L, Z), *Elmer 7883* (A, BP, E, K, L, US, W, Z), *Elmer 7833* (A, BO, BP, E, K, L, MO, NSW, NY, US, W, Z - type of *Carruthersia kindleyii*). Zambales: *Curran 6908* (US); Acoje Mine Concession, Santa Cruz, *Ridsdale 1483* (L), *Ridsdale 1535* (A, K, L). – Mindanao: Camp Keithley, Lake Lamao, *Clemens s.n.* (BO, M), *Clemens 756* (US). – Mindoro: Mt Calavite, *Ramos 39406* (A, BM, BRI), *Ramos 39377* (A, BM, BO, L); Mt Yagaw, E slope, *Sulit & Conklin 17687* (A); N coast, Subaan River inland from San Teodoro, *Coode et al. 5446* (A, L), *Coode 5446* (BO, K); Lantuyan, N face of Mt. Halcon, *Stone et al. 485* (L). – Panay: Capiz: Jamindan, *Ramos & Edaño 31112* (K, P), *Ramos & Edaño 31321* (A, BRI, K, NSW, SING, US); Libacao, *Martelino & Edaño 35293* (BM, K, P); Mt Madiaas, *Ramos & Edaño 30701* (A, P, US). – Samar: s.l., *Ramos 17432* (BM, US); Catubig River, *Edaño 24913* (K, US); Mt Mahagna, Parabucan, Oquendo, *Sulit 14332* (A, BM, BO, L), *Sulit 14464* (A, L); Mt Sapoton, *Madulid et al. 952* (L). – Sibuyan: Magallanes (Mt Giting-Giting), *Elmer 12384* (A, BISH, BM, BO, BP, E, K, L, MO, NSW, NY, P, US, W, Z).

PAPUA NEW GUINEA. Bougainville: along road to, c. 12 miles W of Buin, *Craven & Schodde 497* (A, CANB, K, L); Kupec-Arawa track, near Kieta, Crown Prince Mts, *Womersley NGF 13349* (A, BRI, CANB, K); near Barilo village, 6 miles N of Buin Station, *Schodde & Craven 3968* (A, BRI, CANB, K, L); Siwai, *Waterhouse 473 B* (A, K, L), *Waterhouse 680 B* (K, L), *Waterhouse 816 B* (A, K, L).

SOLOMON ISLANDS. Guadalcanal: 1 km N of Gold Ridge village, *Forster & Liddle PIF 8720* (BRI); Dawson's Pit, Gold Ridge, *Griffith 37* (BRI); Makina Area, *Mauriasi et al. BSIP 11212* (L); near Gold Ridge village, *Forster & Liddle PIF 8713* (BRI); Sorvorhio Basin, *Kajewski 2702* (A, BISH, BRI); Tambalusu, *Corner 188* (K, L). – Malaita: Kwaimonafou River, *Corner 247* (A, K, L); NE, *Fa'arodo et al. BSIP 13499* (K, L). – San Cristobal: confluence of Warahito & Pegato rivers, *Whitmore BSIP 6106* (A, K, L); (NE) Warahito River c. 8 miles inland, *Whitmore BSIP 6211* (A, CANB, K, L, P, SING); Huro River, *Brass 2609* (A, BISH, BM, BO, BRI, L - type of *Carruthersia brassii*); Wairaha River, 5 miles from N coast, *Whitmore BSIP 4358* (K, L, SING). – Santa Isabel: Bogotu, W of Perega village, *Whitmore BSIP 2749* (K, L, SING - type of *Carruthersia mollis*).

3. **Carruthersia scandens** (Seem.) Seem.

Rejoua scandens Seem., Bonplandia 10 (1862) 296. — *Carruthersia scandens* (Seem.) Seem., Fl. Vit. (1866) 156, t. 30; A.C. Sm., Fl. Vit. Nov. 4 (1988) 79. — Type: *Storck 901* (K lecto, designated here; BISH, BM, GH, W iso), Fiji.

Branchlets glabrous. *Leaves:* petioles 1.1–2.7 cm long; blade elliptic, apex acuminate, base obtuse to weakly cordate, 4.4–16.1 × 1.7–5.6 cm, 2.1–3.9 × as long as wide, 7–12 pairs of lateral nerves, glabrous. *Inflorescences* few-flowered axillary and terminal cymes, glabrous, 4.5–10.3 cm long; pedicels 5.5–31 mm long. *Sepals* ovate, apex rounded to obtuse, 1–2.2 × 0.9–1.3 mm, 0.9–2.1 × as long as wide, glabrous, ciliate or not. *Corolla* whitish, sometimes tinged reddish; tube 1.4–2.5 cm long; lobes 1–1.7 cm long, 0.6–0.8 × as long as tube, 9.5–14 mm wide, 1–1.6 × as long as wide; lobes ciliate or not in bud, glabrous outside, pubescent inside. *Stamens* inserted at 2.1–2.2 mm from corolla base, which is 0.1 of tube length; filament 1 mm long; anthers 2.1–2.2 × 0.5–0.6 mm, 3.5–4.4 × as long as wide. *Disc* ovate, apex rounded to obtuse, 0.5 mm long. *Ovary* 0.5–0.7 mm long; style + pistil head 2.8 mm long. *Fruit* narrow linear, glabrous, 11.1–16.2 cm long, 3.7–4.5 mm wide. *Seed* grain 12.7–13.5 × 0.8–1.5 mm; coma 2.7–3.1 cm long.

Distribution and Habitat — Fiji. In forest and dense thickets to 600 m altitude.

Note — Some of the plants discussed by Rolfe (1883) as *C. scandens* are actually *C. latifolia.* The two plants Smith collected in Viti Levu, Mt Mbatini (*652, 661*) have particularly long pedicels but are otherwise unremarkable.

Collections studied:

FIJI. s.l., *Storck 901* (BISH, BM, GH, K, W - type), *Horne s.n.* (K). – Ovalau: *Gillespie 4523* (BISH, K, NY, US). – Vanua Levu: Mathuata, summit ridge of Mt Numbuiloa, E of Lambasa, *Smith 6473* (BISH, BRI, L, P). – Viti Levu: central road, Suva 8 miles, *MacDaniels 1155* (BISH); Colo i Suva, Naitasiri, *Koroiveibau & Pillay 11580* (BISH), *Vunibobo 3287* (BISH), *Nand & Kaliova 9855* (BRI), *Figgess 12065* (BRI, K); Nandarivatu, *Tothill & Tothill 393* (K); Serua, between Ngaloa & Wainiyambia, *Smith 9530* (A, BISH, K, L, NY, US); Serua, hills between Wainiggere & Waisese Creeks, *Smith 9370* (A, BISH, K, L, NY, P, S, US); Serua, hills W of Waivunu Creek, between Ngaloa & Korovou, *Smith 9492* (US); Suva, Cascades, *Livingston s.n.* (US); Suva, Hotel Tradewind, *Schwabe 71* (B); Suva, summit of Central Road, *Tothill 387* (BISH, BRI, K); Tamavua Ridge, *Vaughan 3167* (BISH, BM, K); Thakaundrove, Mt Mbatini, *Smith 652* (B, BISH, NY), *661* (BISH, NY); Tholo West, vicinity of Mbelo, near Vatukarasa, *Degener 15257* (A, NY).

INSUFFICIENTLY KNOWN SPECIES

Carruthersia hirsuta Elmer, Leafl. Philipp. Bot. 2 (1909) 587. — Type: *Elmer 8899* (BM, BO, BP, E, MO, NY, US, W, Z), Philippines, Luzon, Benguet Province, Baguio.

This species is represented by only one fruiting collection. It could be a synonym of *C. pilosa* as was concluded by Merrill (1923) but the seeds are very unusual in having a deeply fissured testa, quite unlike the smooth seeds of the fruiting specimens collected in the Solomon Islands.

Carruthersia axilliflora Merr., Philipp. J. Sci. 27 (1925) 51. — Type: *Loher 12351*, Philippines, Luzon, Rizal Province, Montalban.

I have been unable to locate any type material of this species. The holotype was probably destroyed in PNH. From the description it appears to be distinct from *C. pilosa* but I have seen no other material which matches the description.

SPECIES EXCLUSAE

Carruthersia daronensis Elmer, Leafl. Philipp. Bot. 4 (1912) 1450. — Type: *Elmer 11099* = ***Ichnocarpus frutescens*** (L.) W.T. Aiton.

Carruthersia imberbis Elmer, Leafl. Philipp. Bot. 2 (1909) 588. — Type: *Elmer 9239* = ***Urceola brachysepala*** Hook. f.

Carruthersia laevis Elmer, Leafl. Philipp. Bot. 4 (1912) 1449. — Type: *Elmer 12837* = ***Urceola laevis*** (Elmer) Merr.

ACKNOWLEDGEMENTS

I would like to thank John Parnell for the opportunity to work in Dublin, Marcella Campbell for help with the curation of material and Holly Nixon for the illustrations. This work was carried out as part of the European Union network on Plant Biodiversity in the Indo-Pacific Region.

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The numbers in brackets refer to the number of the species; ik = insufficiently known; x = excluded species. Accepted names are in Roman type; synonyms, insufficiently known and excluded species in italics.