

## A REVISION OF ELAEAGNUS (ELAEAGNACEAE) IN MALESIA

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### SUMMARY

In Malesia there are 3 taxa of *Elaeagnus* L. (*Elaeagnaceae*): *E. conferta* Roxb., *E. triflora* Roxb. var. *triflora*, and *E. triflora* var. *brevilimbatus* from New Guinea and Queensland, here described.

### INTRODUCTION

The Malesian species of *Elaeagnus* L. (*Elaeagnaceae*) belong to the section *Elaeagnus* (or sect. *Sempervirentes*, *nom. inval.*, Servettaz, 1909).

A. Richard (1823) recorded *E. latifolia* L. and *E. ferruginea* A. Rich. for Malesia, while later authors added *E. philippensis* Perrottet (1824), *E. javanica* Bl. and *E. rigida* Bl. (1826), and *E. cumingii* Schlechtend. (1857). Several authors, furthermore, mis-identified specimens as *E. angustifolia* L. (Blanco, 1837), which is a temperate Eurasian species, and *E. latifolia*, a tropical continental Asiatic one. Because confusion with the latter is wide-spread in the literature, we have included it in our key.

Blanco (1837) nowhere cited author's names, and therefore it seems most reasonable to assume that he did not intend to describe *E. angustifolia* as new, but instead identified his specimen(s) with the Linnean species.

Of the other taxa recorded, *E. cumingii*, *E. ferruginea*, and *E. rigida* are here considered as heterotypical synonyms of *E. triflora* Roxb., while *E. javanica* is one of *E. conferta* Roxb.

Schlechtendal (1857) misidentified a cultivated specimen from Pulau Penang as *E. gonyanthes* Benth. (see note sub *E. conferta*).

Servettaz (1908, 1909) made an excessively detailed classification of the genus, splitting up the classical species into a number of others, subspecies, and varieties. This work is often more an impediment than a help in the study of the taxonomy of *Elaeagnus*.

His monograph exists also as a reprint without any direct reference to the Beihefte (1909), even the printer's marks having been nearly completely removed; it has a short introduction, not found in the original work, but is otherwise apparently identical in contents and pagination. The references in the present article refer to the reprint. Then there is also a reprint of the first half of the original, apparently printed in 1909 in Thonon-les-Bains, but published in 1911 in Paris, according to the wrappers and frontispice. This latter reprint has been completely reset with a different pagination and a sometimes more abbreviated text. For our purposes there seemed to be no differences.

The delimitative characters used by Servettaz have usually been drawn from too few specimens, and his use of the shape, size, colour, and consistency of the leaves and the colour of the flowers has proven to be of little worth, as these generally are individual features of the specimens, but not of taxa.

He has a very confusing way of citing his material. For instance for *E. triflora* var. *longipes* Serv. (1909, p. 108) he cited to have seen the numbers '324, 356, 367, and 322' in L ('H.L.B.'). These numbers refer, respectively, to *Anonymus s.n.*, L sheet no. 902.154 → 324, *Hb. Reinwardt s.n.*, L 902.154 — 356, *Anonymus 19*, L 902.154 — 367, and *Junghuhn 22*, L 902.154 — 322, i.e. references to the last part of the Leiden sheet numbers. In other cases, however, he used a numbering of his own devise, possibly based on loan-numbers, e.g. *E. ferruginea* Rich. ssp. *sumatrana* Serv. (p. 112), where L specimens '33, 34, 35, 37' are cited. These numbers are found on his identification slips on the sheets of unnumbered Korthals-collections, which were probably remounted after the loan had been returned, now bearing the L-numbers 908.146 → 2583, — 2582, — 2577, and — 2555, respectively. He sometimes used his own number on different sheets, e.g. '49' both on L 908.146 — 2549 and — 2570. Finally, he also cited original collector's numbers, e.g. '1829 Zollinger' for *E. zollingeri* Serv. (p. 113). All this together makes it very time-consuming to trace his material and methods.

In Malesia he distinguished 6 species and a number of infra-specific taxa. Later authors have recognized only one, joining all into *E. latifolia*, or two, *E. conferta* and *E. triflora*. We agree with the latter opinion, although it may be remarked that the differences between these two species and *E. latifolia* are only slight. The differences seem to be clear-cut when flowers are available, but vegetative material is impossible to identify. Hence, the distribution of the taxa is not always completely clear. None of Servettaz' infra-specific taxa could be maintained. On the other hand a number of collections from New Guinea and Queensland, which were not seen by Servettaz, were so conspicuously different in the shape of the flower, that we have regarded these as belonging to an undescribed variety of *E. triflora*. Some of these specimens were cited by Merrill & Perry (1941) as *E. triflora* ssp. *tetragonia* Serv., which name is a synonym of *E. triflora* proper.

The species of *Elaeagnus* in Malesia are probably always armed (according to Van Steenis, oral comm.), but the thorns, derived from short shoots, are usually present on the older parts, and thus but rarely represented in the herbarium.

#### MATERIAL, ACKNOWLEDGEMENTS

This survey was begun during an advanced course in Angiosperm taxonomy at the Rijksherbarium, Leiden by Mr. E. 't Hart and Ms. M. J. v. d. Voort-Vinkestijn under the supervision of Dr. J. F. Veldkamp, and completed by the present authors. It is mainly based on the specimens present in L. Veldkamp checked the specimens in P during a visit there and selected a small loan for further study; Dr. E. Launert, Richmond, searched for the Roxburgh-types in BM and had them sent. Both he and the Director of the Laboratoire de Phanérogamie, Muséum National d'Histoire Naturelle, Paris (P) are therefore thanked for their cooperation.

#### LITERATURE

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## ELAEAGNUS

- Elaeagnus* Tourn. [Inst. Rei Herb., ed. 2 (1700) 53, t. 489] ex L., Sp. Pl. 1 (1753) 121; Gen. Pl., ed. 5 (1754) 57; A. Rich., Mém. Soc. Hist. Nat. Paris 1 (1823) 381, 400, 402, f. 24–1; Schlechtend. in DC., Prodr. 14, 2 (1857) 606; Benth. & Hook. f., Gen. Pl. 3 (1880) 204; Gilg in E. & P., Nat. Pfl. Fam. III, 6a (1894) 246; Serv., Bull. Hb. Boiss. II, 8 (1908) 381; Beih. Bot. Centr. Bl. 25, 2 (1909) 1 ('Mon. Eléagn.); Back. & Bakh. f., Fl. Java 2 (1965) 85. — Lectotype: *E. angustifolius* L.  
*Ocetarillum* Lour., Fl. Cochinch. (1790) 90. — Type: *O. fruticosum* Lour. [= *E. fruticosa* (Lour.) Cheval., see note sub *E. conferta*].

Shrublets, shrubs, rarely trees, or (in Malesia) woody climbers, branching monopodially, with stellate scales; older parts usually armed with thorns derived from short shoots. *Leaves* alternate, simple, entire. *Flowers* usually bisexual, in axillary inflorescences, or pseudo-terminal, cymose, actinomorphic, 4–(5–8)-merous. *Bracteoles* absent. *Perianth* simple; tube  $\pm$  cylindric, quadrangular, constricted above the ovary, then inflated ('limb'); perianth-segments 4, valvate. *Disk* usually inconspicuous, intra-staminal. *Stamens* 4, alternitelpalous, inserted in the throat; anthers dorso-versatile, introrse with 2 longitudinal slits. *Ovary* superior, 1-locular; style 1; stigma unilateral, elongated; ovule 1, basal, anatropous. *Fruit* a drupe, enclosed in the enlarged perianth-tube, usually with 8 longitudinal ribs; exocarp fleshy, mesocarp bony or leathery, endocarp wooly pubescent inside (in Malesia). *Seed* 1; endosperm absent (in Malesia), rarely scanty; embryo straight.

**D i s t r i b u t i o n :** About 45 species according to Willis (Dict., ed. 8, 1973) in Europe, temperate and tropical Asia, Australia, Central and North America; 2 species in Malesia.

**U s e s :** The Malesian species are usually misidentified as *E. latifolia* and the possibly different uses of the species can therefore not be disentangled. Heyne (Nutt. Pl. Ind., ed. 3, 1950, 1152) mentioned the presence of more or less edible, sourish fruits (*areuj susumunding* or *areuj dudurenan*) and of extremely acid ones (*areuj dudurenan*). This may be due either to the presence of various races of one or both species, or it may be of specific significance.

## KEY

- 1a. Limb<sup>1</sup>) 2–7 mm long, either about subequal to, or twice as long as the perianth-segments (in open flowers!) . . . . . 2

<sup>1</sup>) Limb: this term is usually employed for the free part of a connate perianth; in *Elaeagnus*, however, it is the inflated, quadrangular part of the perianth between the constriction of the tube and the perianth-segments.

- b. Limb 1–1.5 mm long, *c.* half as long as the perianth-segments. — Pedicel 2–5 mm long. Limb broadly rectangular in side-view. Style glabrous
- 2b. *E. triflora* var. *brevilimbatus***
- 2a. Pedicel 1–2(–3) mm long. Limb 3.5–7 mm long, twice as long as the perianth-segments . . . . . 3
- b. Pedicel 2–5(–7) mm long. Limb 2–3(–4) mm long, subequal to 1.5 times as long as the perianth-segments. — Style hook-shaped, glabrous, rarely with some stellate scales at base . . . . . **2a. *E. triflora* var. *triflora***
- 3a. Flowers trumpet-shaped. Limb 3.5–4 mm long, sometimes thickened at base. Style hook-shaped, densely stellate-scaly, especially near the base
- 1. *E. conferta***
- b. Flowers tubulose-campanulate. Limb 4.5–7 mm long. Style straight, sparsely scaly at base only. (Not in Malesia) . . . . . ***E. latifolia* L.**

### 1. *Elaeagnus conferta* Roxb.

- E. conferta* Roxb. [Hort. Beng. (1814) 11, *nomen*] Fl. Ind., ed. 1 (1820) 460; ed. 2, 1 (1832) 440; A. Rich., Mém. Soc. Hist. Nat. Paris 1 (1823) 385, 405; Schlechtend. in DC., Prod. 14, 2 (1857) 612; Linnaea 30 (1859–1860) 367; Linnaea 32 (1863) 301; Kurz, For. Fl 2 (1877) 331; Serv., Bull. Hb. Boiss. II, 8 (1908) 389; Beih. Bot. Centr. Bl. 25, 2 (1909) 89, 91, f. 5.1–6 (incl. ssp. *eu-conferta* Serv., f. 12.1–4, –8, 13, and var. *calcuttensis* Serv., f. 12.1, *nom. inval.*); Lecomte, Fl. Gén. I.-C. 5 (1915) 181; Back. & Bakh. f., Fl. Java 2 (1965) 86. — **T y p e:** *Roxburgh s.n.* (BM, holo).
- E. javanica* Bl., Bijdr. 13 (1826) 638; Schlechtend. in DC., Prod. 14, 2 (1857) 614; Linnaea 30 (1859–1860) 377; Back. in Heyne, Nutt. Pl. Ind., ed. 3 (1950) 1152. — *E. conferta* ssp. *javanica* Serv., Bull. Hb. Boiss. II, 8 (1908) 389; Beih. Bot. Centr. Bl. 25, 2 (1909) 95, f. 12.5, –9, –11, –14 (incl. var. *typica* Serv., *nom. inval.*). — **L e c t o t y p e** (here proposed): *Hb. Blume s.n.* (L 902.154–316, holo; –311, –312, –314, –315 in L; P, iso).
- E. arborea* Roxb. var. *dendroidea* Schlechtend. in DC., Prod. 14, 2 (1857) 612. — *E. dendroidea* Schlechtend., Linnaea 30 (1859–1860) 362. — *E. conferta* ssp. *dendroidea* Serv., Bull. Hb. Boiss. II, 8 (1908) 389; Beih. Bot. Centr. Bl. 25, 2 (1909) 93, f. 12.7, –10, –12. — **T y p e:** *Griffith 128* (Hb. Lindley in B†, holo; not found in L, P, see note).
- E. gaudichaudiana* Schlechtend. in DC., Prod. 14, 2 (1857) 612; Linnaea 30 (1859–1860) 370; Serv., Bull. Hb. Boiss. II, 8 (1908) 390; Beih. Bot. Centr. Bl. 25, 2 (1909) 103, f. 5.11–16 (incl. var. *typica* Serv., *nom. inval.*); Merr., Trans. Am. Philos. Soc. II, 24 (1935) 279 sub *E. fruticosa*, see note. — **T y p e:** *Gaudichaud s.n.* (G, holo, *n.v.*; L, iso).
- ? *E. conferta* var. *malaccensis* Serv., Beih. Bot. Centr. Bl. 25, 2 (1909) 92, f. 12.3. — **S y n t y p e s:** *Maingay KD 1312* (K, *n.v.*); B, 'no. 174', †; L 'no 343', not found.
- ? *E. conferta* ssp. *mollis* Serv., Bull. Herb. Boiss. II, 8 (1908) 389; Beih. Bot. Centr. Bl. 25, 2 (1909) 96. — **L e c t o t y p e** (here proposed): *Pierre 3309*, P, holo, iso; not in L, see note).
- E. conferta* var. *septentrionalis* Serv., Beih. Bot. Centr. Bl. 25, 2 (1909) 92, f. 12.2. — **T y p e:** *King's Coll. s.n.* (L 902.154–348, holo).
- E. conferta* var. *silhetensis* Serv., Beih. Bot. Centr. Bl. 25, 2 (1909) 92, f. 12.4. — **T y p e:** *Wallich 4025-B* (G, K, *n.v.*; L, P; microfiche IDC 1049).
- E. gonyanthes auct. non* Benth.: Schlechtend., Linnaea 30 (1859–1860) 371, *pro specim. Sonder* (see note).
- E. latifolia auct. non* L.: Hook. f., Fl. Br. Ind. 5 (1886) 202, *p.p.*; Ridl., Fl. Mal. Pen. 3 (1924) 148.

Evergreen woody climber, up to 4 m high, innovations silvery scaly. *Axillary buds* 2, collateral. Petioles 8–11 mm long. Leaf blade elliptic to obovate, 6.5–11(–12.5) by 3.5–5(–5.5) cm, base obtuse, sometimes rounded, apex acute to acuminate; nerves 5–8 pairs, loop-shaped; blade above with a slightly immersed midrib, below brown to silvery scaly. *Inflorescences* 1–5 (or 6)-flowered fascicles, bracts up to 2 mm long. *Pedicels* 1–2(–3) mm long. *Flowers* trumpet-shaped, 6–8 mm long; tube 1.5–2(–2.5) by *c.* 1 mmØ; limb 3.5–4 by 1.5–2.5(–3)

mm $\varnothing$ , c. twice as long as the perianth-segments; these triangular to broadly ovate, (1–)1.5–2 by 1.5–2 mm, inside with stellate scales. *Filaments* filiform, broadly winged towards the base, 0.5–1.5 mm long; anthers (0.5–)1(–1.5) mm long. *Ovary* 1–2 by c. 0.5 mm $\varnothing$ , glabrous. *Style* terminally hook-shaped, exserted for (0.5–)1–2 mm above the throat, densely stellate-scaly; stigma 1–2 mm long. *Fruits* not seen (see note).

**Distribution:** S.E. Asia from Nepal, India (Assam, Andamans, Nicobars) through Bangladesh, Birma (Pegu) to Vietnam (North and South) and Malesia: Sumatra (Tapanuli, E. Coast), Malaya (P. Penang, Perak, see note), Java (Bogor, Preanger, Semarang, Madiun, Surabaya).

**Ecology:** Rarely recorded, in Java in forests between 1000 and 2000 m alt.

**Collector's note:** Flowers straw-coloured (Roxburgh, 1820).

**Vernacular names:** *guara* (Bengal), *deei loi* (Annam), *go gê* (Moi), *areuj dudurenan*, *a. susumunding*, *kakaduan*, *meligi* (Sund.)

**Notes:** It is not certain whether this species should actually be called *E. conferta*. As may be noted we have included in the synonymy *E. gaudichaudiana* from Indo-China, of which Merrill (1935) stated that it was identical with Loureiro's *Octarillum fruticosum* [= *E. fruticosa* (Lour.) Cheval.]. We have not seen Loureiro's specimen (BM), which is very likely unidentifiable, as it consists of leaves only, and therefore this is a dubious name. That it would be automatically identical with *E. gaudichaudiana*, because that would be the only species occurring in Indo China, as suggested by Merrill, is incorrect, as Servettaz distinguished a number of other taxa in that area, e.g. *E. conferta* ssp. *balansae* Serv., *E. conferta* ssp. *mollis* Serv., *E. gussonii* Gasp., and *E. tonkinensis* Serv. A revision of the Indo-chinese taxa was not the object of the present study, but at least ssp. *balansae* seems distinct and should not be included in *E. conferta*. It may be noted that Loureiro described his specimens as having solitary flowers, while *E. conferta* usually has several-flowered fascicles, which are only occasionally reduced to a single flower.

*E. conferta* is thus the oldest name available of certain application. The type was taken from a plant introduced from Silhet, Bengal, in the Botanic Gardens of Calcutta in 1795, which most likely provided the later collections by Wallich annotated 'BGC'; '505 Gaudichaud', cited by Servettaz, was seen in P, and is actually a Wallich-collection (but not of the Catalogue), annotated by Wallich as '*E. conferta* Roxb.!' Similarly, *Wallich 503* in Hb. Gaudichaud (P), annotated *E. triflora* Roxb.!' by Wallich was almost certainly taken from the plant introduced in 1804 from Sumatra in Calcutta, which provided the type for the latter name.

Servettaz (1909) distinguished a ssp. *dendroidea* and mentions in the synonymy and a note the name *E. acuminata* Link (1821). This name is based on sterile material and in our opinion should be regarded as a dubious name, also. Schlechtendal (1859–1860) was of the opinion, correctly or not, that it was a synonym of *E. arborea* Roxb., while Servettaz (1909) thought he could match it with *E. conferta* through a sterile specimen in L (no. '335'). To the present authors this seems too speculative, however.

The type of ssp. *arborea* Serv., *Griffith 128* in Hb. Lindley, could not be found in L, nor is it in P, although Servettaz claimed to have seen it there. From his description we agree that it belongs to *E. conferta*.

There is also no specimen of *E. conferta* ssp. *mollis* in L ('*Pierre 3309*, in L sub no. 359', Servettaz, 1909), but in P there are several. They belong to *E. conferta*.

*E. conferta* var. *malaccensis* Serv. has been included, although again no specimens have been seen. According to Servettaz the flowers are identical to those of the type-variety ('var. *calcuttensis* Serv.'). The specimen in L ('no. 343') could not be found. Ridley (1924) noted that 'a large mass of this has been here (i.e. on P. Penang) for many years, but I do not think it is indigenous.' This strongly suggests that all collections from P. Penang pertain to this stand. Schlechtendal (1859–1860) referred a collection from the island to *E. gonyanthes*, also suggesting that it was cultivated there. This misidentification was copied by Servettaz under *E. gussonii* (1909, p. 98), he furthermore mentioned a literature reference to a Curtis-collection under *E. triflora* ssp. *tetragonia*, and finally identified specimens from that locality as *E. conferta* var. *malaccensis*. As only recently the species has also been found on Maxwell's Hill, Perak (*Hardial & Samsuri 276*), it may be assumed that it has been introduced there, too.

*Griffith KD 4383/1* is a mixture of various collections. Those from East Bengal partly belong to *E. latifolia* (they represent the types of *E. griffithii* Serv.), partly to *E. conferta*. Those from East Himalaya are *E. latifolia*, while those from Burma & Malay Peninsula belong to *E. conferta*.

## 2. *Elaeagnus triflora* Roxb.

- E. triflora* Roxb. [Hort. Beng. (1814) 11, *nomen*] Fl. Ind. ed. 1 (1820) 459; ed. 2, 1 (1832) 439; Serv. Bull. Hb. Boiss. II, 8 (1908) 390; Beih. Bot. Centr. Bl. 25, 2 (1909) 104, f. 5.21–25 (incl. ssp. *eu-triflora* Serv., f. 13.2, and var. *stricta* Serv., *nom. inval.*); Back. & Bakh. f., Fl. Java 2 (1965) 86. — *E. latifolia* L. var. *triflora* Schlechtend. in DC., Prod. 14, 2 (1857) 610; Linnaea 30 (1859–1860) 348. — Type: *Roxburgh s.n.* (BM, holo; G, n.v.).
- E. ferruginea* A. Rich., Mém. Soc. Hist. Nat. Paris 1 (1823) 387, 404; Schlechtend. in DC., Prod. 14, 2 (1857) 610; Linnaea 30 (1859–1860) 350; Linnaea 32 (1863) 303; Miq., Pl. Jungh. 2 (1852) 173; Fl. Ind. Bat. 1, 1 (1858) 980; Gilg in E. & P., Nat. Pfl. Fam. III, 6a (1894) 251; Serv., Bull. Hb. Boiss. II, 8 (1908) 390; Beih. Bot. Centr. Bl. 25, 2 (1909) 110, f. 5.26–28 (incl. ssp. *eu-ferruginea* Serv. and var. *richardia* Serv., f. 5.26, *nom. inval.*). — Type: *Leschenault s.n.* (P, holo).
- E. philippensis* Perrottet, Mém. Soc. Linn. Paris 3 (1824) 114; Merr., Sp. Blanc. (1918) 279; Enum. Philip. Fl. Pl. 3 (1923) 134; Quisumbing, Med. Pl. Philip. (1951) 638. — *E. perrottetii* Schlechtend. in DC., Prod. 14, 2 (1857) 613; Miq., Fl. Ind. Bat. 1, 1 (1858) 981, *nom. superfl.* — *E. cumingii* Schlechtend. ssp. *perrottetii* Serv., Bull. Hb. Boiss. II, 8 (1908) 391; Beih. Bot. Centr. Bl. 25, 2 (1909) 101. — Type: *Perrottet s.n.* (G, holo, n.v.; L 902.154–358, P).
- E. rigida* Bl., Bijdr. 13 (1826) 639; Miq., Pl. Jungh. 2 (1852) 173; Schlechtend. in DC., Prod. 14, 2 (1857) 614; Miq., Fl. Ind. Bat. 1, 1 (1858) 981; Schlechtend., Linnaea 30 (1859–1860) 376; Linnaea 32 (1863) 304. — *E. triflora* ssp. *rigida* Serv., Bull. Hb. Boiss. II, 8 (1908) 390; Beih. Bot. Centr. Bl. 25, 2 (1909) 107, f. 13.5 — Lectotype (here proposed): *Hb. Blume s.n.* (L no. 902.181–27, holo).
- E. angustifolia* auct. non L.: Blanco, Fl. Filip., ed. 1 (1837) 74; ed. 2 (1845) 53; ed. 3, 1 (1877) 100. — *E. alingaro* Schlechtend. in DC. Prod. 14, 2 (1857) 615; Linnaea 30 (1859–1860) 381. — Type: Description by Blanco.
- E. cumingii* Schlechtend. in DC., Prod. 14, 2 (1857) 613; Miq., Fl. Ind. Bat. 1, 1 (1858) 981; Schlechtend., Linnaea 30 (1859–1860) 375; Serv., Bull. Hb. Boiss. II, 8 (1908) 391; Beih. Bot. Centr. Bl. 25, 2 (1909) 99 (incl. ssp. *eu-cumingii* Serv., f. 5.33–35, *nom. inval.*). — Type: *Cuming 460* (G, holo, n.v.; L, P).
- E. cumingii* ssp. *philippinensis* Serv., Bull. Hb. Boiss. II, 8 (1908) 392; Beih. Bot. Centr. Bl. 25, 2 (1909) 102. — Type: *Comm. Fl. For. Filip. 539* ('569') (L, holo).
- E. rostrata* Serv., Bull. Hb. Boiss. II, 8 (1908) 392; Beih. Bot. Centr. Bl. 25, 2 (1909) 113, f. 5.40–42. — Type: *Lobb 44* (G, holo, K, n.v.).
- E. triflora* ssp. *obsoleta* Serv., Bull. Hb. Boiss. II, 8 (1908) 390; Beih. Bot. Centr. Bl. 25, 2 (1909) 107. — Lectotype (here proposed): *Zollinger 372* (L, holo, P; G, n.v.).
- E. triflora* ssp. *polymorpha* Serv., Bull. Hb. Boiss. II, 8 (1908) 390; Beih. Bot. Centr. Bl. 25, 2 (1909) 108, f. 13.3, –6, –7. — Type: not indicated (descr. in clave), presumably the same as var. *longipes*, q.v.
- E. triflora* ssp. *tetragonia* Serv., Bull. Hb. Boiss. II, 8 (1908) 390; Beih. Bot. Centr. Bl. 25, 2 (1909) 106, f. 13.1, –4. Lectotype (here proposed): *Reinwardt 30* (L no. 908.146–2565 = *Servettaz no. 42*, holo).

- E. zollingeri* Serv., Bull. Hb. Boiss. II, 8 (1908) 392; Beih. Bot. Centr. Bl. 25, 2 (1909) 112, f. 5.36–39. — **T y p e**: *Zollinger 1829* (L, holo, P; G, n.v.).
- E. ferruginea* var. *atrovirens* Serv., Beih. Bot. Centr. Bl. 25, 2 (1909) 111. — **L e c t o t y p e** (here proposed): *Beccari 189* (L, holo; FI, n.v.).
- E. ferruginea* ssp. *sumatrana* Serv., Bull. Hb. Boiss. II, 8 (1908) 391; Beih. Bot. Centr. Bl. 25, 2 (1909) 112, f. 5.27. — **L e c t o t y p e** (here proposed): *Korthals s.n.* (L no. 908.146–2577 = *Servettaz no. 35*, holo).
- E. triflora* var. *brevipes* Serv., Beih. Bot. Centr. Bl. 25, 2 (1909) 109, f. 13.7. — **L e c t o t y p e** (here proposed): *Reinwardt s.n.* (L no. 902.154–327, holo).
- E. triflora* var. *longipes* Serv., Beih. Bot. Centr. Bl. 25, 2 (1909) 108, f. 13.6 — **L e c t o t y p e** (here proposed): *Junghuhn 22* (L, holo).
- E. conferta* auct. non Roxb.: Ridl., J. Fed. Mal. Stat. Mus. 8, 4 (1917) 81.
- E. latifolia* auct. non L.: A. Rich., Mém. Soc. Hist. Paris 1 (1823) 386, 404; Mor., Syst. Verz. (1846) 70; Miq., Pl. Jungh. 2 (1852) 173 (incl. forms); Zoll., Syst. Verz. 2 (1854) 117; Schlechtend. in DC., Prod. 14, 2 (1857) 610, p.p.; Linnaea 30 (1859–1860) 347; Kurz, Nat. Tijdschr. Ned. Ind. 27 (1864) 172; Benth., Fl. Austr. 6 (1873) 39; Hook. f., Fl. Br. Ind. 5 (1886) 202, p.p.; Forb. & Hemsl., J. Linn. Soc. Bot., London 26 (1894) 403, p.p.; Gilg in E. & P., Nat. Pfl. Fam. III, 6a (1894) 251, p.p.; Gamble, J. As. Soc. Beng. 75, 2 (1912) 267; Koord., Exk. Fl. Java 2 (1912) 658; Merr., Sp. Blanc. (1918) 279; Rendle, J. Bot. 63 (1925) Suppl. 90, p.p.?; C. T. White, Contr. Arn. Arb. 4 (1933) 75; Malm in Fedde, Repert. 34 (1934) 282.
- E. latifolia* var. *arborea* auct. non Roxb.: Ridl., J. Fed. Mal. Stat. Mus. 8, 4 (1917) 81.

#### a. var. *triflora*

Evergreen woody climber, occasionally shrubby, up to 10 m high, innovations silvery scaly. *Axillary buds* 2, collateral. *Petioles* (4–)5–6(–7) mm long. *Leaf* blade elliptic to oblong, 1.5–10(–12) by (0.3–)1–4(–6) cm, base obtuse, sometimes rounded, apex acuminate, sometimes acute; nerves 5–8 pairs, loop-shaped; blade above with a slightly immersed midrib, below brown to silvery scaly. *Inflorescences* 1–3-flowered fascicles; bracts up to 2 mm long. *Pedicels* 2–5(–7) mm long, elongated in fruit to 8 mm long. *Flowers* trumpet-shaped, 6–9 mm long; tube 1.5–2.5 by c. 1 mm $\varnothing$ ; limb 2–3(–4) by (1.5–)2–2.5(–3) mm $\varnothing$ , slightly shorter than to 1.5 times as long as the perianth-segments; these broadly ovate, (2–)2.5–4(–5) by 2–3 mm, inside sometimes with stellate scales. *Filaments* filiform to cone-shaped, 0.3–1 mm long; anthers (0.5–)1(–1.5) mm long. *Ovary* 1–2 by 0.5(–1) mm $\varnothing$ , glabrous. *Style* filiform, terminally hook-shaped, exerted for (0.5–)1–2 mm above the throat, glabrous, rarely with a few scattered stellate scales at base; stigma 1–2 mm long. *Fruit* 10–13 by 4.5–5 mm $\varnothing$ ; seed up to 8 by 3 mm; embryo up to 7 by 3 mm; radicle c. 1.5 mm long.

**D i s t r i b u t i o n**: Malesia: Sumatra (Aceh, Tapanuli, East-, West Coast, Benkulu, Lampong), Java (Jakarta, Bogor, Preanger, Kedu, Malang, Besuki), Lesser Sunda I. (Bali, Flores, Timor), Borneo (Sabah), Philippines (Batan I., Luzon, Polilo, Palawan, Negros, Cebu, Panay, Mindanao, Jolo), Celebes (Bontain, Central), New Guinea (Vogelkop, Eastern Highlands, Central Dist., Milne Bay Dist., New Britain) (see note); Australia: Queensland, ? New South Wales (see note).

**E c o l o g y**: Primary rain forest, swamp forest, secondary scrub with *Gleichenia*; (0–)200–1300(–1800) m alt. Sometimes gregarious.

**C o l l e c t o r ' s n o t e s**. Flowers fragrant, white, cream, pale yellow, whitish and brown dotted, pale inside. Fruit pinkish to glossy red or pale brown, when ripe juicy and sweet to very acid.

**U s e s**: The ripe fruit is given to children suffering from amoebic dysentery (Sulit, 1934, cited by Quisumbing, 1951, sub *E. philippensis*). Chopra (1933, ex Quisumbing, l.c.) stated that the flowers are astringent and cardiac.

**Vernacular names.** *hail-hail* (Batak, Toba), *kail-kail* (Batak, Karo), (*areuj* or *daun*) *dudurenan*, *empos*, *kakaduan*, *kicepot*, *leutik* (Sund.), *berbikuda*, *godong wadang*, *ketadak* (Mad.), *kelincu* (Bali), *bantap* (Sul.), *banaken* (Bon.), *kopapei*, *padias* (Ig.), *lagot* (Buk.), *malaimus* (P. Bis.) (Abbreviations according to Merrill).

**Notes:** Although *E. triflora* is not a very variable species, Servettaz nevertheless split it up into 5 species, 10 subspecies and 5 varieties. Because the aim of the present study was primarily to disentangle the Malesian taxonomy and nomenclature, it can not be ruled out that the species occurs in continental Asia as well, but under some other name. It was, of course, not possible to check all names recorded for that area, but so far none were discovered which should have been included here.

For the typification of the name used here see also the note under the preceding species.

*E. rostrata* Serv., of which the type has not been seen, seems to belong here according to its description.

The variety is probably more wide-spread in Malesia than could be indicated here, as sterile specimens can not well be distinguished from *E. conferta* and *E. triflora* var. *brevilimbatus*. For New Guinea, where it occurs together with the latter only, the following localities may be added for the species as a whole: West Sepik Dist. and New Ireland. Servettaz mentioned the species also for New South Wales, but we have seen no records, nor is the family taken up in the Index to the families of the Flora of New South Wales. In Java, where *E. conferta* and *E. triflora* var. *triflora* occur together the following vernacular names refer to one or both of them: *kakaduan*, *kicepot* (Sund.).

**b. var. *brevilimbatus* 't Hart, var. nov.**

*E. triflora* Roxb. ssp. *tetragonia* auct. non Serv.: Merr. & Perry, J. Arn. Arb. 22 (1941) 267.

A var. *triflora* in limbo late rectangulari (lateraliter viso) segmentis perianthi dimidio brevior (1–1.5 mm longo vs. 3–4, rare 4.5 mm longis) differt.

**Type:** *Brass 11703* (L, holo; iso in A, n.v.), New Guinea, Balim River, 1600 m.

Petiole (2–)3–4(–5) mm long. Leaf blade with (5–)6–11 pairs of nerves. Inflorescences consisting of 1–4 (or 5)-flowered fascicles. Flowers 4–7.5 mm long; tube 1.5–2 by c. 1 mmØ; limb 1–1.5 by 1.5–2 mmØ, c. half as long as the perianth-segments; these broadly ovate, 2–3 by (1.5–)2(–2.5) mm, stellate-scaly inside. Fruit 15–17 mm long. Seed up to 12 by 4.5 mm; embryo up to 9 mm long.

**Distribution:** Malesia: New Guinea (Vogelkop, Northwest, Chimbu Dist., Morobe Dist., Central Dist., Northern Dist., Milne Bay Dist.); Australia: Queensland.

**Ecology:** Primary rain forest, *Castanopsis*-forest, swampy secondary forest; (0–)450–1600(–2125) m alt.

**Collector's notes:** Climber or scrambling shrub, to 30 m high. Flowers grey green, white, yellow, very fragrant. Fruit red, fleshy.

NOMINA DUBIA

**1. *E. conferta* Roxb. var. *pallescens* Serv., Beih. Bot. Centr. Bl. 25, 2 (1909) 96. –**

**Type:** *Korthals s.n.* (L no. 908.146–2572 = *Servettaz no. 29*, holo).

Identity uncertain, as the type is sterile.

2. *E. conferta* Roxb. ssp. *firma* Serv., Bull. Hb. Boiss. II, 8 (1908) 389; Beih. Bot. Centr. Bl. 25, 2 (1909) 96. — Synonymy: '*Khasia*' in *L* sub no. '350', not found; *Cat. It. Burman 1396* (G, n.v.).

Identity uncertain, as the types are said to be sterile and have not been seen.

#### INDEX TO COLLECTORS

Unnumbered collections have been omitted. Collections mentioned in the literature of which the identity seemed reasonably certain have their taxon-number between brackets. Some incomplete collections from New Guinea and Australia have been identified to the specific level only. Sterile specimens from The Philippines are assumed to belong to *E. triflora* var. *triflora*.

- A 4548* (Wood e.a.): 2a; *Alston 13784*: 2a; *Anonymus 19*: 2a; *Arens 34*: 1.  
*Backer 36496*: 1; *Bakhuizen v. d. Brink 2990*: 1; 3449: 2a; 5351: 2a; 5731: 2a; *Bartlett 8368*: 2a; 8597: 1; *Bartlett & LaRue 173*: 1; 278: 2a; *Beccari 189*: 2a; 235: 2a; *Beumée 6824*: 2a; *S. T. Blake 9903*: 2a; *Blume 1399*: 2a; *Boerlage 159*: 2a; *Brass 2338*: 2a; 11703: 2b; 13273: 2b; 23735: 2b; 33483: 2a; *Brinkman 886a*: 1; *BS 5355* (Ramos): 2a; 18088 (Robinson): 2a; *Bünnemijer 8108*: 2a; 8358: 2a; 11642: 2a.  
*Carr 11969*: 2b; 12578: 2a; 15470: 2; *Clemens 169*: 2b; 468: 2b; 2005: 2b; 26172: 2a; 30040: 2a; 34204: ?2a; 51676: ?2a; *Coert 95*: 2a; 135: 2a; *Com. For. Fil. 539*: 2a; *Commerson 43*: 2a; *Crutwell 1372*: 2b; *Cuming 460*: 2a; *Curtis 904*: (1).  
*Danser 6320*: 2a; *Darbyshire 485*: 2; *De Candolle 73*: (2a); *Dilmy 894*: ?2a; *Dockrill 1267*: 2a; *Dunselman 19*: 2a.  
*Elmer 5791*: 2a; 7524: 2a; 9113: 2a; 13178: 2a; 16478: 2a; 21973: 2a; *Enoh 174*: 2a; *Eyma 1205*: 2a.  
*Fallen & Endress 638*: 2; *FB 18187* (Curran e.a.): 2a; *Forbes 835*: 1; 1388: 2a; 2578-b, -c: 2a; 2857 = 2578; 2902a: 2a; 3875: 2a.  
*Gaudichaud 503*: (2a); *Griffith KD 4383/1* p.p.: 1.  
*Hallier f. 332-b, c*: 2a; v. *Harreveld 5472*: 2a; *Hatusima 28522*: (2a); 28559: (2a); *Hemstra 101*: 2a; *Hoogland 4537*: 2b; *Hort. Bog. XII.B. 168*, -a: 2a; 170: 2a; -171, -a: 2a; -172: 2a; *XV.C. 33*, -a: 2a; *Huitema 59*: 2a; *Hyland 3453*: 2a.  
*Jacobs 4358*: 2a; 4526: 2a; *Junghuhn 22*: 2a; 69: 2a; -79: 2a.  
*Kajewski 1071*: 2a; 1296: 2a; *Kakah 162*: 2a; *Kartamah 417*: 2a; *Kaspiew 815*: 2a; *King's Coll. 5214*: (1); *Kokowa 6155*: 2a; *Kokowa & Hotta 4387*: 2a; *Koorders 23172*: 1; 24474: 2a; 260 13: 2a; 28904: 2a; 28906: 2a; 29208: 1; 29756: 2a; 32901: 1; 36018: 1; 37820: 2a; 42823: 2a; 44142: 2a; *Kostermans 6240*: 2a; *Kostermans e.a. 82*: 2a; *Kooij 361*: 2a; *Kurz 2138*: 2a.  
*Langlasse 73*: 2a; *Lörzing 1469*: 1; 5488: 2a; 8523: 2a.  
*Maingay KD 1312*: 1; *Merrill Sp. Blanc. 26* (Gates & Catalan): 2a; *Dec. Philip. For. Fl. 16* (Ahern's coll.): 2a; *Meijer 6046*: 2a; 6631: 2a; *Mzin 243*: 2a.  
*Nagata 398*: 2a; *Nedi & Idjan 345*: 2a; 427: 2a; *NGF 7856* (Womersley & Millar): 2b; 14124 (Womersley): 2b; 21103 (Streiman & Kairo): 2a; 23952 (Streiman): 2a; 28713 (id.): 2a; 30520 (Ridsdale): 2a; 41156 (Galore): 2b; 41846 (Henty & Lelean): 2a; 46063 (Coode e.a.): 2a.  
v. *Ooststroom 13127*: 2a; 13826: 2a.  
*Pierre 3309*: 1; *PNH 21787* (Edaño): 2a; *Pullen 8481*: 2a.  
*Raap 669*: 1; *Rahmat si Boeea 10535*: 1; *Reinwardt 30*: 2a; *Rensch 1432*: (2a); v. *Royen 4978*: 2a; v. *Royen & Sleumer 6812*: 2b; *RSNB 2776* (Chew & Corner): 2a; 4412 (id.): 2a.  
*SAN 28279* (Singh): 2a; 32359 (Badak): 2a; 33105 (Lajongah): 2a; 76480 (Madani): 2a; *Schiffner 2275*: 2a; 2276: 2a; *Schmutz 1100*: 2a; 1764: 2a; *Sinclair & Edaño 9745*: 2a; *Sinclair e.a. 8966*: 2a; v. *Slooten 577*: 2a; *L. S. Smith 10146*: 2a; *Soejatmi 34*: 2a; *Soewarta 172*: 1; v. *Steenis 18402*: 2a; *Stein 1148*: (2a); 1173: (2a).  
*Thorne & Tracey 23222*: 2a; *Thozet 458*: 2.  
*Unesco 280* (Kostermans): 2a.  
*Vanoverbergh 200*: 2a; 1926: 2a; *Verheijen 3175*: 2a; *de Voogd 729*: 2a.  
*Wallich 503*: 2a; 505: 1; 4025-B: 1; *Walsh 308*: 2a; 363: 2a; *Warburg 1292*: (2a); 13121: (2a); 16747: (2a); 18366: (2a); *Whitford 845*: 2a; 989: 2a; *Wight KD 2499*: 1; *de Wilde & de Wilde-Duyfjes 12501*: 2a; 13565: 2a; *Winckel 1551*: 2a; *Woerjantoro 25*: 2a; 26: 2a.  
*Yates 1432*: 2a; *Yoshida 913*: 2a.  
*Zollinger 372*: 2a; 1043: 2a; 1829: 2a; 2513: 2a.