

## New Combinations in Malaysian Staphyleaceae

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### Abstract

New combinations are made for the seven species of *Dalrympelea* (Staphyleaceae) from Malaysia that were previously included in *Turpinia*. *Dalrympelea pomifera* Roxb. is distinct from *D. sphaerocarpa* (Hassk.) A.T.Nor-Ezzawanis and does not occur in Malaysia and *Turpinia ovalifolia* Elmer from the Philippines is distinct from *D. trifoliata* (Ridl.) A.T.Nor-Ezzawanis.

### Introduction

Staphyleaceae currently includes two genera, *Dalrympelea* Roxb. and *Staphylea* L. (Simmons, 2007; Stevens, 2010), that can be distinguished by the following morphological characters: stoloniferous shrubs (2 m) to upper canopy trees of 25-30 m in *Dalrympelea*, and small trees reaching 15 m in *Staphylea*; the bark ranges from creamy yellow and flaky to smooth grey in *Dalrympelea*, and grey to black and somewhat mottled, with or without lenticels in *Staphylea*; the stipules of opposed leaves are fused and sometimes becoming bifid at the apex, often having a colleter in *Dalrympelea*, and the stipules are free and multi-veined in most species of *Staphylea*. The former occurs in the Old World and the latter in both the Old and New Worlds.

Based on molecular analysis using nuclear and chloroplast markers, Staphyleaceae divides into two clades that are treated as distinct at the generic level (Simmons & Panero, 2000; Simmons, 2007). One clade, *Staphylea*, includes all species of *Staphylea*, all New World species of the *Turpinia* Raf., and one Asian species, *Turpinia cochinchinensis* (Lour.) Merr. and the monotypic *Euscaphis japonica* (Thunb.) Kanitz (Simmons, 2007).

The other clade includes the Old World *Turpinia* species, except for *Turpinia cochinchinensis*. Members of this latter clade are generally characterized by being evergreen trees with fused stipules (at least at the base), coriaceous leaves and a berry with a thickened pericarp (Simmons, 2007). Because the type species of *Turpinia* is *T. cochinchinensis*, which is now included in *Staphylea*, the name *Turpinia* cannot be applied to the Asian species. The earliest name for this clade is *Dalrympelea* Roxb. (Roxburgh,

1819). The revision of the family for the Flora of Peninsular Malaysia necessitates making new combinations for local *Turpinia* species besides reassessing the status of some species. New combinations are also provided for species in the Malaysian states of Sabah and Sarawak in Borneo that were revised by Pereira (1995).

*DALRYMPELEA* Roxb.

Hort. Beng. (1814) 17, *nomen*, Pl. Corom. 3 (1819) 76, t. 279; Simmons in Kubitzki, Fam. Gen. Vasc. Pl. 9 (2007) 443. Type species: *Dalrympelea pomifera* Roxb., Pl. Corom. 3 (1819) 76, t. 279.

Synonym: *Turpinia* Vent., Choix (1803) 31, t. 31, p.p. excl. New World species and *T. cochinchinensis*; Ridley, Fl. Malay Pen. 1 (1922) 511; Linden, Fl. Malesiana 1, 6 (1960) 51; Whitmore, Tr. Fl. Malaya 1 (1972) 447; Pereira, Tr. Fl. Sabah & Sarawak (1 (1995) 454.

Evergreen shrubs to large trees to 30 m tall, sometimes with buttresses. **Leaves** pinnately (1- or 3-) or 5-15-foliolate, coriaceous; stipules interpetiolar, basally connate to fused along their length. **Inflorescences** terminal or axillary panicles with more than 100 flowers. **Flowers** with sepals free, shorter than the pink, cream, yellow or green-white petals; stamens arising between the lobes of the nectary disc; ovary (2-)3(-4)-locular, sometimes partially imbedded in the disc, more or less syncarpous, with 2-8 ovules per locule. **Fruit** an ellipsoid, nearly globose or trilobed berry, fleshy or leathery, usually green to purple; exocarp thick and fleshy to woody. **Seeds** 1-6 per fruit.

*Distribution*: About 20-25 species from Sri Lanka and S India to China and Japan and southwards to New Guinea (Simmons, 2007) with 8 species in Malaysia (2 species in Peninsular Malaysia and 6 species and 1 variety in Sabah and Sarawak).

### New Combinations for Malaysian Species

1. *Dalrympelea borneensis* (Merr. & L.M.Perry) A.T.Nor-Ezzawanis, *comb. nov.*

**Basionym**: *Turpinia montana* var. *borneensis* Merr. & L.M.Perry, J. Arnold Arbor. 22 (1941) 553. -Homotypic synonym: *Turpinia borneensis* (Merr. & L.M.Perry) B.L.Linden, Fl. Malesiana 1, 6 (1960) 56; Pereira, Tr. Fl. Sabah & Sarawak 1 (1995) 456. -**Type**: Borneo, Sabah [British North Borneo], Gunung Kinabalu, Tenompok, J. & M.S. Clemens 29391 (holotype, UC; isotypes, BO, K).

*Distribution*: Borneo (Kalimantan and Sabah) and the Philippines.

2. *Dalrympelea calciphila* (J.T.Pereira) A.T.Nor-Ezzawanis, *comb. nov.*

**Basionym:** *Turpinia calciphila* J.T.Pereira, Sandakania 5 (1994) 18, fig. 1, Tr. Fl. Sabah & Sarawak 1 (1995) 457. –**Type:** Borneo, Sarawak, Miri Division, Gunung Api, *Anderson S 4710* (holotype, SAR; isotypes, BO, K, L, SING).

*Distribution:* Endemic in Sarawak, Borneo – Kuching Division near Bau (Bukit Buan and Bukit Gebung) and Miri Division (Gunung Api and Gunung Buda).

3. *Dalrympelea grandis* (B.L.Linden) A.T.Nor-Ezzawanis, *comb. nov.*

**Basionym:** *Turpinia grandis* B.L.Linden, Fl. Malesiana 1, 6 (1960) 55; Pereira, Tr. Fl. Sabah & Sarawak 1 (1995) 457. –**Type:** E Borneo, W Koetai, Kiau River, *Endert 4669* (holotype, L; isotypes, BO, K).

*Distribution:* Endemic in Borneo (Kalimantan, Sabah and Sarawak).

4. *Dalrympelea nitida* (Merr. & L.M.Perry) A.T.Nor-Ezzawanis, *comb. nov.*

**Basionym:** *Turpinia nitida* Merr. & L.M.Perry, J. Arnold Arbor. 22 (1941) 549; Linden, Fl. Malesiana 1, 6 (1960) 58; Pereira, Tr. Fl. Sabah & Sarawak 1 (1995) 459. –**Type:** Borneo, Sabah [British North Borneo], Gunung Kinabalu, Penibukan, *J. & M.S. Clemens 30840* (holotype, UC; isotypes, BO, K).

*Distribution:* Endemic in Sabah, Borneo (Ranau, Sandakan, Kudat and Lahad Datu Districts).

5. *Dalrympelea sphaerocarpa* (Hassk.) A.T.Nor-Ezzawanis, *comb. nov.*

**Basionym:** *Turpinia sphaerocarpa* Hassk., Flora 25, 2 (1842) Beibl. 1, 42; Ridley, J. Str. Br. Roy. As. Soc. 82 (1920) 179; Linden, Fl. Malesiana 1, 6 (1960) 49; Whitmore, Tr. Fl. Malaya 1 (1972) 448; Pereira, Tr. Fl. Sabah & Sarawak 1 (1995) 460. Homotypic synonym: *Turpinia pomifera* (Roxb.) DC. var. *sphaerocarpa* (Hassk.) King, J. As. Soc. Beng. 65 (1896) 453. –**Type:** Java, *sine coll., s.n., Herb. Reinwardtianum* (holotype, L, acc. no. 908272875). Heterotypic synonyms: *Turpinia latifolia* Wall. ex Ridl., J. Str. Br. Roy. As. Soc. 82 (1920) 178, Fl. Mal. Pen. 1 (1922) 512. –**Type:** Singapore, *Wallich 4939* (lectotype, K, isotype, CAL). –*Turpinia laxiflora* Ridl., J. Str. Br. Roy. As. Soc. 82 (1920) 179, Fl. Malay Pen. 1 (1922) 512; Linden, Fl. Malesiana 1, 6 (1960) 57. –**Type:** Peninsular Malaysia, Perak, Larut, *Kunstler 2824* (holotype, K).

*Taxonomic notes:* Wallich (1828) in his Catalogue named *Wallich 4939* as ‘*Turpinia ?latifolia*’. Hiern (1875) included *Turpinia latifolia* as a synonym of *Turpinia pomifera* (Roxb.) DC. with *Wallich 4939* as the only specimen cited for Malaya.

King (1896) described two varieties of *Turpinia pomifera* from Peninsular Malaysia. The typical variety was represented by a single specimen, *Kings' Collector 4243* from Perak, and *Turpinia pomifera* var. *sphaerocarpa* (Hassk.) King was described as 'the common form in the Malayan Provinces'. King cited *T. latifolia* based on *Wallich 4939* as a synonym of var. *sphaerocarpa*.

*Turpinia sphaerocarpa* Hassk. was originally described from Java and has small fruits 0.5-1.8 cm diameter with a thin pericarp 1-4 mm thick as compared with *Turpinia pomifera* from Continental Asia that Linden (1960) described as having larger fruits 2.5-3.7 cm diameter with a pericarp 5 mm thick. Re-constructing the fragments of the fruit on *Kings' Collector 4243* shows that it has a small fruit about 1.5 cm diameter with a pericarp ca 3 mm thick showing conclusively that it is not a specimen of *Turpinia pomifera*, but is typical of *Turpinia sphaerocarpa*. Ridley (1920) was not able to examine *Kings' Collector 4243* (there is apparently no specimen at Kew) but considered it was unlikely to be the same as the *Turpinia pomifera* and instead he used Wallich's original name, *T. latifolia* Wall. ex Ridl., to describe this common species in Peninsular Malaysia. (Incidentally, he gave Penang Hill as the locality for *Wallich 4939* but in fact Wallich collected it from Singapore). Ridley's description mentioned the fruit diameter as ca 1.3 cm (within the *Turpinia sphaerocarpa* range), but unfortunately he did not record pericarp thickness. Linden (1960) too was doubtful that *Turpinia pomifera* occurred in Peninsular Malaysia and considered *Kings' Collector 4243* as "too inadequate" for identification. He therefore reinstated *Turpinia sphaerocarpa* to specific rank with *Turpinia pomifera* var. *sphaerocarpa* and *T. latifolia* as synonyms. Whitmore (1972) noted that *Turpinia pomifera* was based 'on one doubtful collection', namely *Kings' Collector 4243*. It is therefore now clear that *Turpinia pomifera* does not occur in Peninsular Malaysia.

Of the three type specimens at L (acc. nos. 908272875, 908272863 and 908272865), sheet number 908272875 is chosen as the lectotype because it is the most complete specimen with more fruits and it is from Herbarium Reinwardtianum.

Ridley (1920) described a new species of *Turpinia*, *T. laxiflora* Ridl., but without a description of the fruit. In his Flora (Ridley, 1922), he distinguished it from *T. latifolia* by panicle size: 20 cm [8 in] long in *T. latifolia* as opposed to 38 cm [15 in] in *T. laxiflora*. Linden (1960) followed Ridley in retaining *T. laxiflora* as a distinct species noting that it differed from *T. sphaerocarpa* in its wider leaflets (8-24 × 3.5-12 cm as opposed to 3-18 × 2-10 cm in *T. sphaerocarpa*), larger panicles (to 45 cm vs. to 30 cm long), narrower petals (2.25-2.5 × 1-1.25 mm vs. 2.5 × 1.5 mm), shorter filaments (1.5-1.75 mm vs. 2-2.5 mm long), smaller fruits (0.5-1 cm vs. 1-1.5 cm diameter) and very thin pericarp (0.2-0.9 mm thick vs. 1-3 mm thick in *T. sphaerocarpa*). However, Whitmore (1972) synonymised *T. laxiflora* with *T. sphaerocarpa* but without giving a reason for his decision.

Examination of specimens from Peninsular Malaysia identified as *T. latifolia*/*T. sphaerocarpa* and *T. laxiflora* show that the characters listed by Linden (1960) are not mutually exclusive. For example, *Corner 28690* (KEP) has a panicle *ca* 21 cm long, which falls within *Dalrympelea sphaerocarpa*, but the petals measure *ca*  $2 \times 1.25$  mm and filaments *ca* 1.25-1.5 mm long and so fall within the range for *T. laxiflora*. Similarly, *Jaamat 10275* (KEP) has a fruit *ca* 1.2 cm diameter with a pericarp *ca* 4 mm thick that fits *D. sphaerocarpa* but the petals measure *ca*  $2 \times 1$  mm and the filaments are *ca* 1.5 mm long that fall within the range of *T. laxiflora*. Linden (1960) also mentioned colour of the dried leaf as a distinguishing characters (brown on both surfaces in *T. laxiflora*, but discoloured in *D. sphaerocarpa*), but again it was found that this character did not distinguish these two taxa. There being no constant character or combination of characters to keep *T. laxiflora* apart, it is here treated as a synonym of *D. sphaerocarpa*.

Burkill (1966) confused the picture by recognizing *Turpinia pomifera* and treating both *T. latifolia* and *T. laxiflora* as synonyms of it. He described *T. pomifera* as a “fairly large tree in the lowlands” which indicates that he was probably referring to *Dalrympelea sphaerocarpa*.

Pereira (1994) recognized a second variety, var. *microcerotis*, from Borneo, which differs from var. *sphaerocarpa* in having shorter leaf rachises (2-8 cm vs. 10-18 cm long), shorter leaflets (5-10 cm vs. 7-19 cm long) and a slightly trilobed fruit with three apical horns compared with the globose, hornless fruit of var. *sphaerocarpa*.

*Distribution*: Sumatra, Peninsular Malaysia, Singapore, Borneo, Java, Lesser Sunda Islands (Bali, Flores), Sulawesi, the Philippines and Maluku (Ceram, Ambon).

5a. *Dalrympelea sphaerocarpa* (Hassk.) A.T. Nor-Ezzawanis var. *microcerotis* (J.T. Pereira) A.T. Nor-Ezzawanis, *comb. nov.*

**Basionym**: *Turpinia sphaerocarpa* Hassk. var. *microcerotis* J.T. Pereira, Sandakania 5 (1994) 21, fig. 2; Tr. Fl. Sabah & Sarawak 1 (1995) 461. – **Type**: Borneo, Sabah [British North Borneo], Ranau, Gunung Kinabalu, Tenompok, *J. & M.S. Clemens 28707* (holotype, SING; isotypes, BO, K).

*Distribution*: Endemic in Borneo (Sabah and Kalimantan).

6. *Dalrympelea stipulacea* (B.L. Linden) A.T. Nor-Ezzawanis, *comb. nov.*

**Basionym**: *Turpinia stipulacea* B.L. Linden, Fl. Malesiana 1, 6 (1960) 55; Pereira, Tr. Fl. Sabah & Sarawak 1 (1995) 461. – **Type**: Borneo, Sabah, Gunung Kinabalu, near Tibabah River, *Carr SFN 27516* (holotype, SING).

*Distribution*: Endemic to Sabah (Ranau district only).

7. *Dalrympelea trifoliata* (Ridl.) A.T.Nor-Ezzawanis, *comb. nov.*

**Basionym:** *Turpinia trifoliata* Ridl., J. Str. Br. Roy. As. Soc. 82 (1920) 178, Fl. Malay Pen. 1 (1922) 511, fig. 50. –**Type:** Peninsular Malaysia, Melaka, Nyalas, *Goodenough 1771* (lectotype, SING, here chosen).

Heterotypic synonym: *Turpinia ovalifolia* Elmer, Leaf. Philip. Bot. 2 (1908) 490, *auct. non*: Linden, Fl. Malesiana 1, 6 (1960) 58; Whitmore, Tr. Fl. Malaya 1 (1972) 448. –**Type:** Philippines, Luzon, Lucban Tayabas, *Elmer 8088* (SING).

*Taxonomic notes:* Some authors (Linden, 1960; Whitmore, 1972) considered this species in Peninsular Malaysia to be conspecific with *Turpinia ovalifolia*. However, careful comparison between Peninsular Malaysian specimens and the type specimens of both *T. ovalifolia* and *T. trifoliata* show that the Malaysian specimens previously identified as *T. ovalifolia* in fact belong to *T. trifoliata*. *Turpinia ovalifolia*, known only from the type specimen, is characterized by its small leaves *ca* 4 × 2.5 cm with a more-or-less entire margin. In contrast, *T. trifoliata* specimens cited by Ridley (1920), namely *Goodenough 1771* and *Ridley 15906*, are characterized by larger leaves *ca* 7-14 × 3.5-7 cm with a crenate margin with fine, dark brown (when dry) callous points. These characters are shared by more recently collected specimens from Malaysia and indeed some have even larger leaves up to *ca* 9.5-20 × 4-9.5 cm. Therefore it is concluded that *T. ovalifolia* does not occur in Peninsular Malaysia.

Ridley (1920) cited two specimens in his original description of the species. *Goodenough 1771* is here chosen as the lectotype because it is a more complete specimen and the sheet has Ridley's description of the flower (in his handwriting) and is named '*Turpinia trifoliata*'.

*Distribution:* Peninsular Malaysia (Perak, Selangor, Negeri Sembilan, Pahang and Johor).

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