

HERNANDIACEAE

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Blume, Bijdr. Fl. Ned. Ind., pt 11 (1826 [‘1825’]) 550, as ‘Hernandieae’, nom. cons.; Gamble, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 75(1) (1912) 203; Ridley, Fl. Malay Penins. 3 (1924) 138; Backer & Bakhuizen van den Brink, Fl. Java (Spermatoph.) 1 (1964) 135; Kubitzki, Bot. Jahrb. Syst. 89 (1969) 78; Ng, Tree Fl. Malaya 2 (1973) 244; Keng, Ord. Fam. Malayan Seed Pl., ed. 3 (1983) 37; Keng, Concise Fl. Singapore, vol. 1, Gymn. Dicot. (1990) 20; Kubitzki in Kubitzki et al. (ed.), Fam. Gen. Vasc. Pl. 2 (1993) 334; Duyfjes, Fl. Males., ser. 1, 12(2) (1996) 737; Saw, Tree Fl. Sabah & Sarawak 6 (2007) 11; Li et al., Fl. China 7 (2008) 255; Duyfjes, Fl. Thailand 10(2) (2010) 199; de Wilde & Duyfjes, Fl. Penins. Malaysia, ser. 2, 8 (2021) 201. **Type:** *Hernandia* L.

Gyrocarpaceae Dumort., Anal. Fam. Pl. (1829) 13, as ‘Gyrocarpeae’. **Type:** *Gyrocarpus* Jacq.

Illigeraceae Blume, Nov. Pl. Expos. (1833) 12, as ‘Illigereae’. **Type:** *Illigera* Blume

Trees, shrubs or woody climbers with bisexual or unisexual flowers. **Leaves** alternate, petiolate, without stipules, simple, lobed or unlobed, or palmately compound, margin entire. **Inflorescences** usually axillary, much branched compound cymes or thyrses, sometimes corymbose; with or without bracts. **Perianth** sepaloid with 3–8 imbricate or valvate segments (tepals) in 1 or 2 whorls. **Stamens** 3–7 in a single whorl opposite the tepals, or in a double whorl inserted opposite the outer tepals; filaments with two basal glands, or with one dorsal gland, or without glands; anthers 2-locular, dehiscent with 2 lateral or apical valves; interstaminal staminodes present or absent. **Ovary** inferior, 1-locular; ovule 1, pendulous; style simple, in male flowers absent or reduced; stigma discoid and oblique or capitate. **Fruit** dry, indehiscent, nut- or drupe-like, unwinged and sometimes enclosed by an inflated, fleshy, expanded cupule (*Hernandia*), or with 2–4 lateral wings (*Illigera*) or with 2 apical wings (*Gyrocarpus*, not in Singapore); 1-seeded. **Seeds** without endosperm; embryo straight; cotyledons large.

Distribution. A pantropical family of 5 genera and approximately 60 species. In Singapore, 2 genera, each with 1 native species.

Taxonomy. Hernandiaceae are in the order Laurales and are regarded as most closely related to Lauraceae and Monimiaceae (APG IV, Bot. J. Linn. Soc. 181 (2016) 1–20). Xin et al. (Mitochondrial DNA Part B, 5(3) (2020) 2454–2455) place Hernandiaceae as sister to Monimiaceae. The family has two subfamilies, Hernandioideae and Gyrocarpoideae, the latter formerly recognised as the distinct family Gyrocarpaceae. The genera found in Singapore are in subfamily Hernandioideae. The family has a very wide range of morphologies considering its relatively small size.

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Notes. Each of the two species recorded for Singapore has only ever been recorded once and both are long since nationally extinct although *Hernandia nymphaeifolia* (C.Presl) Kubitzki has been reintroduced.

Michalak et al. (J. Biogeogr. 37 (2010) 1214–1226) note that both *Hernandia* and *Illigera* have biogeographically interesting, although not unique, distributions. *Hernandia* is pantropical and it is suggested that it dispersed from Polynesia to Central America and the Caribbean and from there to West Africa. The presence of several species of *Illigera* in Africa, however, is likely to have been the result of two different long-distance dispersal events from India to Africa rather than through ancient Gondwanan vicariance.

Key to genera

1. Evergreen trees; leaves simple, petiole not twisting; fruit surrounded by an inflated cupule **1. *Hernandia***
- Woody climbers; leaves 3-foliolate, petiole twisting; fruit with 2–4 lateral wings (wings sometimes ridge-like) **2. *Illigera***

1. *HERNANDIA* L.

(Francisco Hernández de Toledo, 1515–1587, Spanish naturalist
and physician to King Philip II of Spain)

Sp. Pl. 2 (1753) 981; Blume, Bijdr. Fl. Ned. Ind., pt 11 (1826 [‘1825’]) 550; Hooker, Fl. Brit. India 5, fasc. 13 (1886) 188; Gamble, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 75(1) (1912) 203; Ridley, Fl. Malay Penins. 3 (1924) 138; Backer & Bakhuizen van den Brink, Fl. Java (Spermatoph.) 1 (1964) 136; Kubitzki, Bot. Jahrb. Syst. 89 (1969) 122; Kubitzki, Fl. Cambodge, Laos & Vietnam 12 (1970) 17; Ng, Tree Fl. Malaya 2 (1973) 245; Corner, Wayside Trees Malaya, ed. 3, 1 (1988) 363; Kubitzki in Kubitzki et al. (ed.), Fam. Gen. Vasc. Pl. 2 (1993) 337; Duyfjes, Fl. Males., ser. 1, 12(2) (1996) 746; Saw, Tree Fl. Sabah & Sarawak 6 (2007) 12; Duyfjes, Fl. Thailand 10(2) (2010) 201, fig. 1: B; de Wilde & Duyfjes, Fl. Penins. Malaysia, ser. 2, 8 (2021) 205. **Type:** *Hernandia sonora* L.

Biasolettia C.Presl, Reliq. Haenk. 2, fasc. 2 (1835) 141. **Type:** *Biasolettia nymphaeifolia* C.Presl (= *Hernandia nymphaeifolia* (C.Presl) Kubitzki).

Trees or shrubs, monoecious. **Leaves** simple, peltate or not, venation palmate or with 3–7 pairs of lateral veins, arching towards the apex. **Inflorescences** usually at and towards the tips of branchlets, the peduncles distinct (rarely short), the ultimate partial inflorescences comprising modified cincinni and these usually subtended by an involucre of 4 bracts comprising 3 flowers: 2 lateral (rarely 1) pedicelled male flowers, and 1 central subsessile female flower (rarely 1 bisexual flower); all parts of inflorescence finely hairy, rarely glabrous; bracteoles of male flowers more or less equal, those of female flowers united into a cupule partly or wholly surrounding the ovary, accrescent with age, or female bracteoles seldom free. **Flowers:** outer tepals imbricate; inner tepals partly valvate. **Male flowers:** 3–5(–6)-merous; ovary and style lacking or style rudimentary; stamens 3–5(–6), filaments free or partly connate, each with 2 free or connate basal glands. **Female flowers:** 4–6-merous; ovary somewhat compressed

laterally, staminodes absent, style sigmoid or straight, at base often thickened and surrounded by 4–6 (or 10–12) free or connate glands, stigma dilated or irregularly lobed. **Fruit:** drupes, ovoid to ellipsoid, often inconspicuously longitudinally ribbed, with or without an umbo (wart) at apex, at maturity enclosed by the inflated, fleshy cupule, or not. **Seeds** with a hard, sometimes spongy testa; cotyledons free or fused, ruminant.

Distribution. A pantropical genus of about 20 species. In Singapore, 1 native species.

***Hernandia nymphaeifolia* (C.Presl) Kubitzki**

(the genus *Nymphaea*, Nymphaeaceae, Latin, *folium* = leaf;
with leaves resembling those of *Nymphaea* L.)

Bot. Jahrb. Syst. 90 (1970) 272; Kubitzki, Fl. Cambodge, Laos & Vietnam 12 (1970) 18; Ng, Tree Fl. Malaya 2 (1973) 245, fig. 2; Keng, Gard. Bull. Singapore 27 (1974) 81; Corner, Wayside Trees Malaya, ed. 3, 1 (1988) 363, fig. 120; Keng, Concise Fl. Singapore, vol. 1, Gymn. Dicot. (1990) 20, fig. 14.1; Turner, Gard. Bull. Singapore 45 (1993) 107; Duyfjes, Fl. Males., ser. 1, 12(2) (1996) 747, fig. 3; Saw, Tree Fl. Sabah & Sarawak 6 (2007) 13, fig. 1; Li et al., Fl. China 7 (2008) 255; Chong et al., Checkl. Vasc. Pl. Fl. Singapore (2009) 48, 139, 193; Duyfjes, Fl. Thailand 10(2) (2010) 201, pl. 29: 1.1–1.3; Chen et al., Gard. Bull. Singapore 71 (2019) 403; Lim et al., Fl. Singapore 1 (2019) 106; de Wilde & Duyfjes, Fl. Penins. Malaysia, ser. 2, 8 (2021) 206, fig. 2, pl. 31; Lindsay et al., Gard. Bull. Singapore 74(Suppl. 1) (2022) 375. **Basionym:** *Biasolettia nymphaeifolia* C.Presl, Reliq. Haenk. 2, fasc. 2 (1835) 142, as '*nymphaeaeifolia*'. **Type:** *Haenke s.n.*, Micronesia, Mariana Islands, Guam (lectotype PR [sheet no. 270811 – a single specimen over 5 sheets], designated here; isolectotype PR [sheet no. 270810]). **Fig. 1, 2.**

Hernandia peltata Meisn. in de Candolle, Prodr. 15(1) (1864) 263; Hooker, Fl. Brit. India 5, fasc. 13 (1886) 188; Ridley, J. Straits Branch Roy. Asiat. Soc. 33 (1900) 132; Gamble, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 75(1) (1912) 204; Ridley, Fl. Malay Penins. 3 (1924) 138; Backer & Bakhuizen van den Brink, Fl. Java (Spermatoph.) 1 (1964) 137; Kubitzki, Bot. Jahrb. Syst. 89 (1969) 153. **Type:** *Thwaites CP 2914*, Ceylon [Sri Lanka] (lectotype G-DC [G00694878], designated by Kubitzki, Bot. Jahrb. Syst. 89 (1969) 122; isolectotypes MEL [MEL2390554], P [P01958505]).

Shrubs or spreading trees 5–20 m tall. **Leaves:** petiole 5–17 cm long, peltately attached 0.5–3 cm from the lamina margin; lamina chartaceous or thinly coriaceous, narrowly or broadly ovate, or subcircular in outline, 7–33 × 6–30 cm, apex acute or slightly acuminate, shining above, dull beneath, glabrous on both surfaces, veins 5–9, palmate, conspicuously white or yellow, the midrib with 2–4 lateral veins per side, arching towards apex. **Inflorescence** 10–30 cm long of which peduncle 6–20 cm long; involucre bracts elliptic to obovate, 2–6 × 1–3.5 mm. **Flowers:** in male 3-merous, in female 4-merous, greenish or white, fragrant. **Male flowers:** pedicel 4–4.5 mm long; tepals c. 5 mm long; anthers yellow, filaments c. 3 mm long, each basally with 2 spatulate c. 1 mm long glands, free or pair-wise fused between the stamens. **Female flowers:** pedicel absent; flower (including the ovary) 8–10 mm long; tepals c. 5 mm long; ovary up to halfway enveloped by the cupule, style papillose, c. 3 mm long, surrounded by 4 (or more), firm, c. 1 mm long, free or fused, glands, stigma pink; cupule at anthesis c. 2 × 3 mm, the margin entire or slightly undulate, in fruit loosely enclosing the drupe, inflated, bell-shaped, fleshy and waxy white or reddish, the margin of the orifice entire

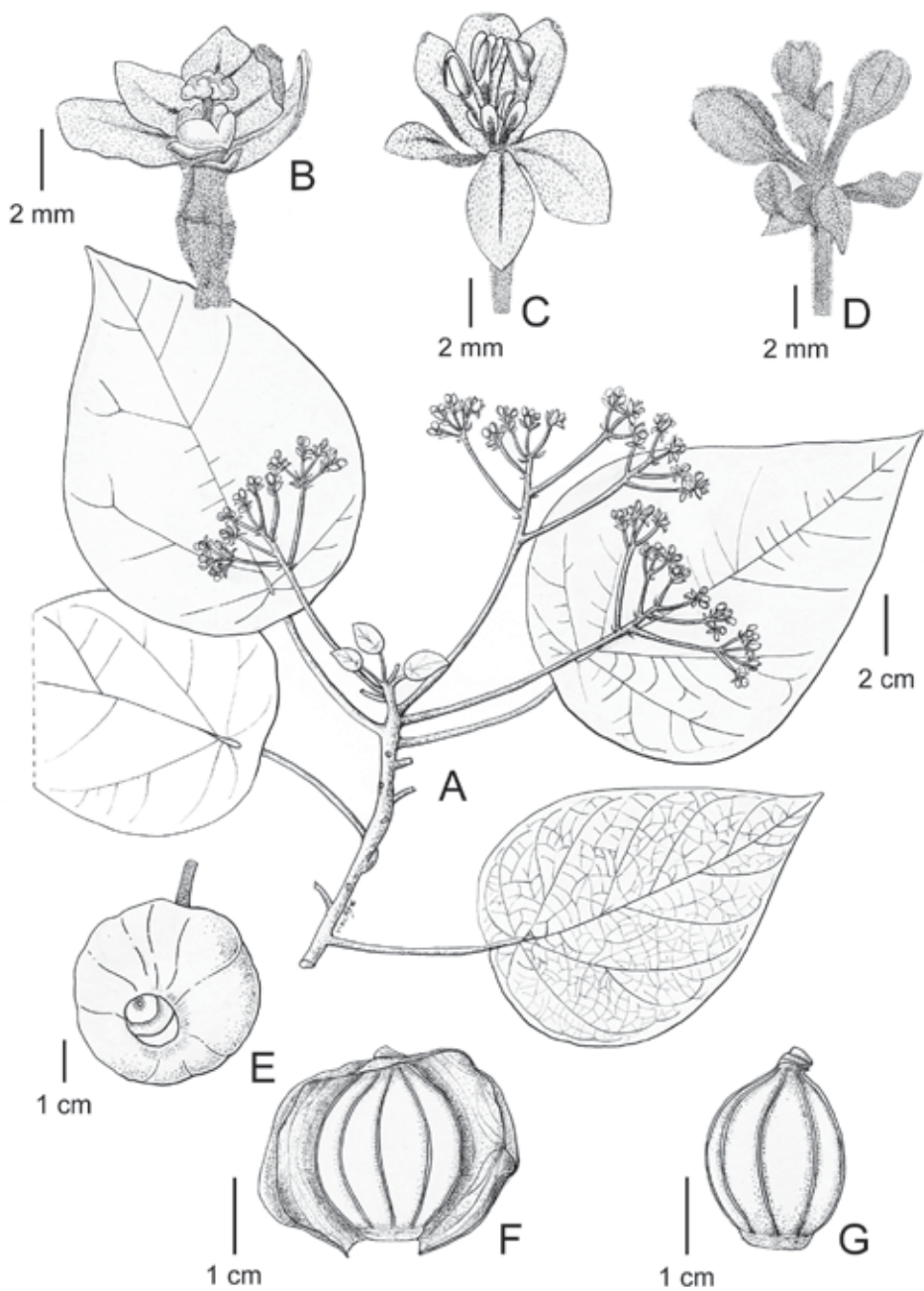


Figure 1. *Hernandia nymphaeifolia* (C.Presl) Kubitzki. **A.** Habit. **B.** Pistillate flower with style surrounded by glands. **C.** Staminate flower with glands between stamens. **D.** Detail of inflorescence showing two pistillate and two smaller staminate buds. **E.** Cupule. **F.** Opened cupule showing the ribbed fruit. **G.** Fruit. (A & D Singapore Botanic Gardens, *Leong SING2019-108*; B & C from Peninsular Malaysia, *Corner s.n.*; E–G from Peninsular Malaysia, *Sinclair 10669*. Drawn by V. Chye).



Figure 2. *Hernandia nymphaeifolia* (C.Presl) Kubitzki. **A.** Habit. **B.** Leaves. **C.** Part of inflorescence. Inset (top): Staminate flower. Inset (bottom): Pistillate flower. **D.** Trunk. **E.** Cupules enclosing fruits. (A, B, D & E from Malaysia, Sarawak; C including insets Singapore Botanic Gardens, Leong SING2019-108. Photos: A, B, D & E, W.F. Ang; C including insets, P.K.F. Leong).

and slightly revolute. **Drapes** as long as the cupule or somewhat exserted, ellipsoid, 2.5–3 × 1.5–2.3 cm, faintly longitudinally 8-ribbed, slightly stalked or not, apex with an umbo, 8–10 mm wide, 2–3 mm high.

Distribution. East Africa, Madagascar, Andaman and Nicobar Islands, Sri Lanka, China (Hainan), Taiwan, Japan (Ryukyu & Bonin Islands), continental Southeast Asia, Malesia and the islands of the Pacific. In Singapore, now known only from planted trees on Pulau Ubin (*Gwee et al. GAT 180*, 21 Jan 2003, SING [SING0042945]), but the species is presumed native having been collected in 1822 from an unspecified locality (*Wallich s.n.* [EIC 7811D], Oct 1822, K-W [K001127966]).

Ecology. Coastal areas, on the sea-shore and in primary and secondary littoral forest below 100 m. The fleshy fruit are presumably bird or bat dispersed.

Conservation assessment. Globally, Least Concern (LC) (IUCN Red List, 2026). In Singapore, assessed as Nationally Extinct (NEx) by Middleton et al. (in Davison et al. (ed.), Singapore Red Data Book, ed. 3 (2024) 485).

Vernacular names. *Buah keras laut*, *sea-hearse*, 蓮叶桐 (NParks' Flora & Fauna Web, 2026).

2. ILLIGERA Blume

(Johann Karl Wilhelm Illiger, 1775–1813, Director of the Zoological Museum in Berlin)

Bijdr. Fl. Ned. Ind., pt 17 (1826–1827 [‘1826’]) 1153; Clarke in Hooker, Fl. Brit. India 2, fasc. 5 (1878) 460; King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 66(1) (1897) 342; Dunn, J. Linn. Soc., Bot. 38(266) (1908) 290; Ridley, Fl. Malay Penins. 3 (1924) 139; Backer & Bakhuizen van den Brink, Fl. Java (Spermatoph.) 1 (1964) 136; Kubitzki, Bot. Jahrb. Syst. 89 (1969) 157; Kubitzki, Fl. Cambodge, Laos & Vietnam 12 (1970) 6; Ng, Tree Fl. Malaya 2 (1973) 247; Kubitzki in Kubitzki et al. (ed.), Fam. Gen. Vasc. Pl. 2 (1993) 337; Duyfjes, Fl. Males., ser. 1, 12(2) (1996) 751; Saw, Tree Fl. Sabah & Sarawak 6 (2007) 12; Duyfjes, Fl. Thailand 10(2) (2010) 202, fig. 1: C; de Wilde & Duyfjes, Fl. Penins. Malaysia, ser. 2, 8 (2021) 208. **Type:** *Illigera appendiculata* Blume, lectotype designated by Hutchinson, Gen. Fl. Pl. 1 (1964) 145.

Corysadenia Griff., Proc. Linn. Soc. London 1 (1846) 281; Griffith, Notul. Pl. Asiat. 4 (1854) 356, as ‘*Corysadenia*’. **Type:** *Corysadenia trifoliata* Griff. (= *Illigera trifoliata* (Griff.) Dunn).

Medium-sized woody climbers; petioles often partly twisted, in young stages with leaflets patent. **Leaves** 3-foliolate (also 5-foliolate in Africa); leaflets petiolulate, apex mostly acuminate, veins basal and lateral, looped, curved towards apex. **Inflorescences** slender lax panicles, terminal and axillary, many- or few-flowered; partial inflorescences cincinni, paired or simple; bracts small, persistent or caducous; bracteoles small, 1–2 mm long. **Flowers** bisexual, 5-merous, perianth segments (tepals) in two rows, valvate in bud, outer ones oblong, 3–5-nerved, inner ones linear, 1–3-nerved; stamens 5, inserted opposite the outer tepals and alternating with sessile glands, or glands absent; filaments straight, or inwardly coiled, each with 2 inflated, mostly membranous, shortly-stiped appendages at base, or appendages clavate

and solid; anthers ovoid; ovary ovoid, 4-ribbed, style filiform, in fruit the ribs grown out into 2 or 4 wings. **Fruit:** nuts with 2 longer and 2 shorter lateral wings; wings striate, suborbicular or lingulate. **Seeds** with membranous testa; cotyledons free, more or less plano-convex, or slightly unequal.

Distribution. A genus of about 20 species, predominantly in the Sino-Himalayan region and also in Africa. In Singapore, 1 native species.

Notes. In the literature from the region, *Illigera* has also been treated in the Lauraceae and Combretaceae.

Illigera trifoliata (Griff.) Dunn

(Latin, *tri-* = three, *folium* = leaf; referring to the leaves consisting of three leaflets)

J. Linn. Soc., Bot. 38(266) (1908) 294; Henderson, Malay. Wild Fls, Dicot. (1959) 20; Kubitzki, Bot. Jahrb. Syst. 89 (1969) 169; Kubitzki, Fl. Cambodge, Laos & Vietnam 12 (1970) 16; Ng, Tree Fl. Malaya 2 (1973) 247, fig. 3; Keng, Gard. Bull. Singapore 27 (1974) 81; Keng, Concise Fl. Singapore, vol. 1, Gymn. Dicot. (1990) 20; Turner, Gard. Bull. Singapore 45 (1993) 107; Duyfjes, Fl. Males., ser. 1, 12(2) (1996) 760; Chew et al., Gard. Bull. Singapore 49(2) (1999 [‘1997’]) 189; Chong et al., Checkl. Vasc. Pl. Fl. Singapore (2009) 50, 139, 193; Duyfjes, Fl. Thailand 10(2) (2010) 207, pl. 29: 3.1, 3.2; Turner & Chua, Checkl. Vasc. Pl. Sp. Bukit Timah Nat. Res. (2011) 36; Chen et al., Gard. Bull. Singapore 71 (2019) 403; Ho et al., Gard. Bull. Singapore 71(Suppl. 1) (2019) 87; de Wilde & Duyfjes, Fl. Penins. Malaysia, ser. 2, 8 (2021) 211, fig. 3, pl. 32; Lindsay et al., Gard. Bull. Singapore 74(Suppl. 1) (2022) 376. **Basionym:** *Coryzadenia trifoliata* Griff., Not. Pl. Asiat. 4 (1854) 356. **Synonym:** *Illigera coryzadenia* Meisn. in de Candolle, Prodr. 15(1) (1864) 251, nom. illeg. superfl.; Clarke in Hooker, Fl. Brit. India 2, fasc. 5 (1878) 460. **Type:** *Griffith s.n.*, [Myanmar], Mergui, [Madamaca Isl.], October 1834 (lectotype K [K000802164], designated by Duyfjes, Fl. Males., ser. 1, 12(2) (1996) 760). **Fig. 3, 4.**

Illigera kurzii C.B. Clarke in Hooker, Fl. Brit. India 2, fasc. 5 (1878) 460. **Type:** *Maingay 1253* [Kew Distribution 649], [Malaysia], Malacca [Melaka], 1865–1866 (lectotype K [K001129824], first step designated Duyfjes, Fl. Males., ser. 1, 12(2) (1996) 760, second step designated here; isoelectotype K [K001129825]).

Illigera appendiculata auct. non Blume: Ridley, J. Straits Branch Roy. Asiat. Soc. 33 (1900) 80; Ridley, Fl. Malay Penins. 3 (1924) 139, fig. 146, p.p.

Large climbers or creepers. **Leaves:** petiole 8–11.5 cm long; petiolules 0.8–2(–3) cm long, slightly or densely hairy; leaflets chartaceous, ovate, 5–15 × 3.5–8 cm, base rounded or cordate, apex acute, upper surface glabrous or variously hairy and often the veins short-hairy, lower surface sparsely hairy, especially on and near the veins, lateral veins c. 6 pairs, at angles of c. 45° to the midrib, intercostal veins inconspicuous above, somewhat distinct below. **Inflorescences** longer than the leaves, panicle lax, for the greater part glabrous. **Flowers:** buds ovoid, 4–5 mm long; outer tepals dark purplish outside, their inner surfaces and both surfaces of inner tepals white or pale greenish, densely hairy, or somewhat hairy towards the tip only; outer tepals narrowly elliptic, 6.5–9 × 1.8–2.5 mm, 5-veined; inner tepals lanceolate, 5–8 × 0.5–1.8 mm, at base c. 0.5 mm wide, 3-veined; filaments straight in bud, filiform, 6–7 mm

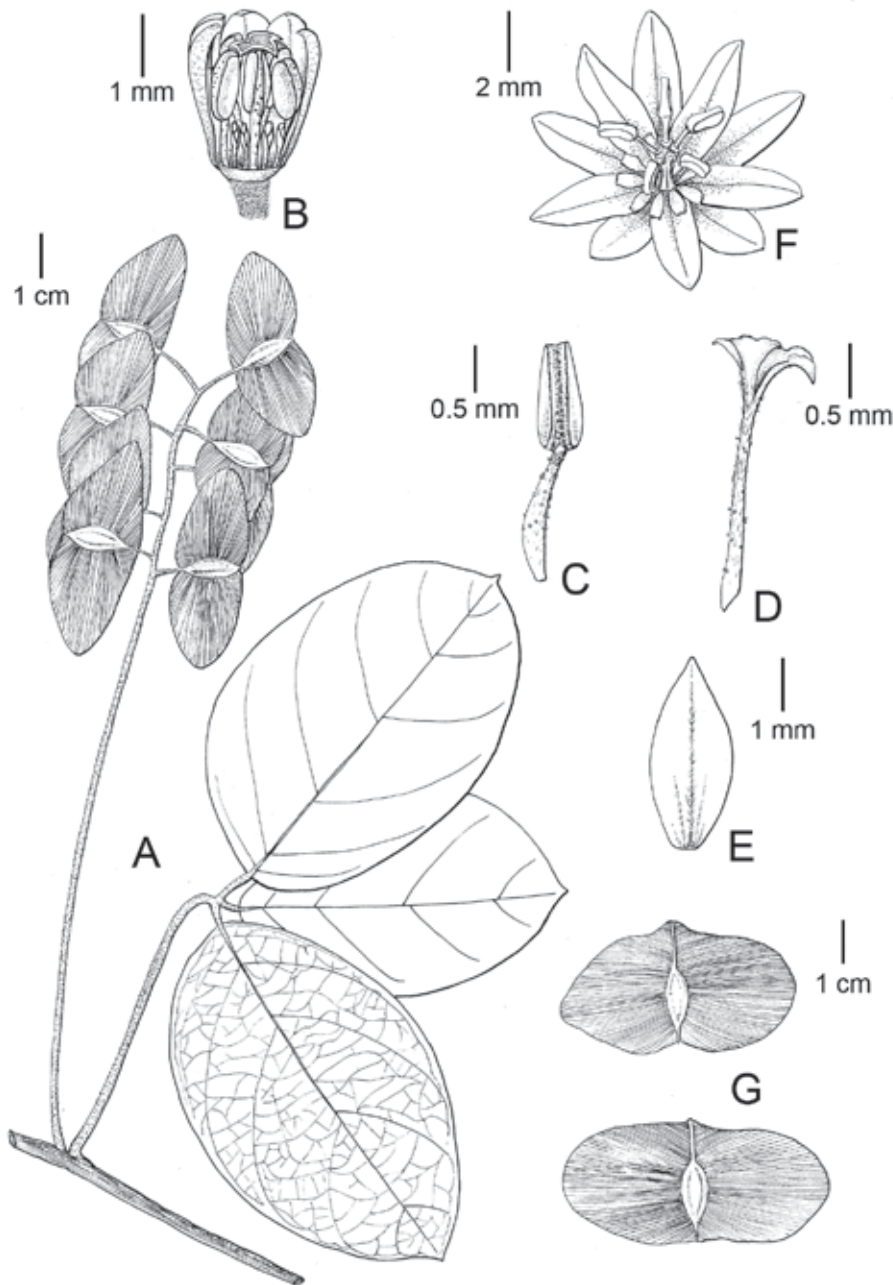


Figure 3. *Illigera trifoliata* (Griff.) Dunn. **A.** Habit. **B.** Flower bud with some tepals removed. **C.** Stamen. **D.** Style and stigma. **E.** Tepal. **F.** Flower. **G.** Fruit. (A–E from Peninsular Malaysia, A, *Ahmad CF5098*; B–E, *Burkill & Mhd Haniff SFN 16580*; F drawn from a photo from Thailand; G from Singapore, Bukit Timah, *Ridley s.n.* Drawn by V. Chye).



Figure 4. *Illigera trifoliata* (Griff.) Dunn. **A.** Habit. **B.** Inflorescence. **C.** Flower; note appendages at base of filaments. (A–C from Thailand. Photos: B.E.E. Duyfjes).

long, somewhat papillose; staminal appendages 0.5–1 mm long-stiped, membranous, inflated, spathe-like, c. 2.5 mm long, with an entire rim; interstaminal glands present; ovary ridged, densely shortly brown-hairy. **Nut** 2-winged and 2-ridged, nut c. 3 cm long, wings lingulate or suborbicular, spreading for 3–4(–4.5) cm, ridges c. 0.2 cm high.

Distribution. Andaman Islands, Myanmar, Laos, Peninsular Malaysia and Sumatra. In Singapore, known only from one historical collection from Bukit Timah, consisting of 6 nuts (*Ridley s.n.*, collected between 1890 and 1900, SING [SING0011194]).

Ecology. In Singapore, formerly in primary lowland forest. Elsewhere, also in secondary forest, margins of evergreen forest, deciduous forest with much bamboo, forest edges, open places, along streams and roadsides to 1400 m. Typically a forest climber with winged wind-dispersed fruit.

Conservation assessment. Globally, not assessed. In Singapore, assessed as Nationally Extinct (NEx) by Middleton et al. (in Davison et al. (ed.), Singapore Red Data Book, ed. 3 (2024) 485.

Note. As no flowering material is known from Singapore, the flower characters in the description are from material from throughout its range.