

Flora of Singapore precursors, 47: The genus *Phytocrene* (Icacinaceae) in Singapore

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ABSTRACT. Two species of *Phytocrene* Wall. are recorded for Singapore: the widespread and commonly collected species *P. bracteata* Wall., and *P. oblonga* Wall., known from a single collection from Nee Soon Swamp Forest in the Central Catchment Nature Reserve. *Phytocrene bracteata* is also cultivated in Singapore Botanic Gardens. The typification of each name is addressed, and a key to the two species, descriptions, an illustration of *P. oblonga* as well as photographs of both species are provided.

Keywords. Climbers, Icacinaceae, liana, Southeast Asia, taxonomy

Introduction

The Icacinaceae are a pantropical family of trees, shrubs and lianas with 24 genera and c. 155 species worldwide (POWO, 2024). Prior to the advent of molecular techniques, the family was somewhat of a ‘dumping ground’ for several groups of unrelated plants with small flowers with pendulous ovules, including groups now placed in Icacinaceae s.s., Stemonuraceae, Cardiopteridaceae and Metteniusaceae (see Utteridge & Schori, 2011; Byng et al., 2014; Potgieter et al., 2016; Stull et al., 2020). In Asia, the family in the traditional, broad sense was treated by Sleumer (1969), with relatively recent Flora accounts available for Malesia (Sleumer, 1971), Thailand (Sleumer, 1970), and China (Peng & Howard, 2008).

In Singapore, the Icacinaceae are represented by two genera of climbers: *Iodes* Blume (with three species) and *Phytocrene* Wall. (with two species) (Lindsay et al., 2022: 381). Whilst the family in the strict sense is difficult to characterise across its distributional range, in Singapore the climbing habit, with the stems showing large vessels in cross-section, together with the (alternate or opposite) leaves having conspicuous venation and ‘elbowed’ petioles, the small green, yellow or brown flowers, and the drupaceous fruits, are good spot characters when attempting to identify the Icacinaceae.

Phytocrene is a conserved name. Although the generic name was first used by Wallich (1828a) in a letter about Burmese plants published in a report of the proceedings of the Linnean Society, Blume (1825) had previously published *Gynoecephalum* Blume. As discussed in more detail by Sleumer (1968), Blume later ‘withdrew’ his name in favour of *Phytocrene*, which was subsequently formally conserved.

Wallich (1828a) had noted that the plant's "trunk is as thick as a man's thigh, and when divided affords a large quantity of a limpid, tasteless, and very wholesome water"; this was no doubt the inspiration for the name derived from the Greek '*phyto*' for plant, and '*crene*' for fountain. Unfortunately, the text in this report was not sufficient to be taken as a generic description, and the name is based on the comprehensive description and illustration in his '*Plantae Asiaticae Rariores*' (Wallich, 1831), based on *Phytocrene gigantea* Wall. (now placed as a synonym of *P. macrophylla* (Blume) Blume). Wallich (1831) listed an additional three species based on material from Penang (then Prince of Wales Island) collected by George Porter, noting: "I am acquainted with three other species, which were discovered in the mountains of Prince of Wales Island, by Mr. George Porter, and of which I subjoin the specific characters". These three species included *Phytocrene bracteata* Wall. and *P. oblonga* Wall., which are the only two species reaching Singapore.

The description of leaf morphology, particularly venation, follows Hickey (1979), and that of two-dimensional shapes follow the Systematics Association Committee (1962).

Key to the genus *Phytocrene* in Singapore

- 1a. Leaves ovate to broadly ovate in mature plants, leaves on juvenile plants 3- to 5-lobed, sometimes deeply lobed, densely hairy on the lamina and venation below; staminate inflorescences elongate to 27 cm long 1. *P. bracteata*
- 1b. Leaves elliptic to obovate (in Singapore material) to oblong (across the range), sparsely hairy on the midrib and venation below; staminate inflorescences very short, to less than 2 cm long (in Singapore material) to 5 cm long (across the range) 2. *P. oblonga*

Taxonomic treatment

1. *Phytocrene bracteata* Wall., Pl. Asiat. Rar. 3 (1831) 12. – TYPE: Malaysia, Penang, 1822 (stam. fl.), *Porter s.n.* [Wall. Cat. no. 4947] (lectotype K-W [K001104281], first step designated by Sleumer in Blumea 17: 238 (1969), second step designated here; isoelectotypes BM [BM000839419], E, G [G00700539], GH [GH00050292 – excluding lower leaf], K [K000700059, K000700060, K000700061], K-W [K001104280], SING [SING0054230]). (Figs 1–3)

Woody climber (length not recorded in Singapore but 'high-climbing liana' fide *Samsuri et al. NES206*); stem up to 2.8 cm diam.; bark grey-brown, with scattered elongate lenticels. **Branchlets** prickly and hairy when young with very dense short stiff hairs and dense to scattered rigid, bristle-like, straight longer hairs, appressed to erect; with scattered retrorse prickly lenticels, especially when young. **Juvenile and shade leaves** highly variable in size and shape, spirally arranged, evenly spaced



Fig. 1. *Phytocrene bracteata* Wall. **A.** Deeply lobed leaves on a juvenile (non-fertile) plant in full sun. **B.** Lobed leaves on a juvenile plant. **C.** Leaves on mature, fertile plant (in full sun). (Photos: T.M.A. Uttridge)

along the stem; petiole 7–14 cm long, hairy, variously furrowed on drying; leaf blade ovate, 3-lobed or 5-lobed, often deeply lobed to palmatifid, $11.5\text{--}28 \times 5.6\text{--}29.5$ cm, chartaceous to coriaceous, apex acute to acuminate, base cordate, densely hairy on all parts above and below; secondary veins 4–7 pairs in ovate leaves, up to 12 pairs in central lobe in 5-lobed leaves, brochidodromous to semicraspedodromous, basal pair ascending and giving a triplinerved appearance, tertiary veins percurrent to reticulate, adaxial venation obscure to slightly raised, abaxially secondary veins and higher orders conspicuously raised and drying sandy-brown. **Mature leaves** spirally arranged, evenly spaced along the stem; petiole 6–13.5 cm long, densely hairy with two types of hairs, short stiff hairs to 0.1 mm long and longer, stiff hairs to 1 mm long, smooth or longitudinally furrowed; leaf blade ovate to broadly ovate, usually entire to occasionally obscurely 3-lobed in outline (in Singapore material), $13\text{--}25 \times 10\text{--}20.5$ cm, coriaceous, apex rounded to acute, base cordate to cuneate, margins entire or slightly undulate to serrulate with 18–22 teeth along each side, lamina sparsely



Fig. 2. *Phytocrene bracteata* Wall. **A.** Staminate inflorescence pre-anthesis. **B.** Detail of staminate inflorescence at anthesis. (Photos: X.Y. Ng)

hairy above with appressed bristle-like hairs, densely hairy below with hairs arranged in tufts with the radial hairs shorter to 0.1 mm long appressed and the central hair stiff and erect to 0.22 mm long, midrib with two type of hairs as the petiole except longer, stiff hairs to 1.3 mm long; secondary veins with 3 pairs palmate from the base and 2–3 pairs distally along the midrib, brochidodromus, tertiary veins percurrent to reticulate, higher order venation orthogonally reticulate, adaxial venation conspicuous and impressed, abaxially secondary veins and higher orders conspicuously raised and densely hairy with hairs arranged in tufts with the radial hairs shorter to 0.1 mm long appressed and the central hair stiff and erect to 0.8 mm long. Plants dioecious. ***Staminate inflorescences*** clustered on woody tubercles on the stem (in Singapore



Fig. 3. *Phytocrene bracteata* Wall. **A.** Infructescence. **B.** Individual fruit. **C.** Endocarp. (Photos: A, T.M.A. Utteridge; B, C, X.Y. Ng)

material), pendulous spikes, densely hairy throughout with short stiff hairs, solitary or up to 5 from each tubercle, 10–27 cm long, ultimate branches consisting of numerous few-flowered umbellules, subtended by a subulate bract up to 1 cm long and densely hairy with longer stiff hairs to 0.8 mm long. **Staminate flowers** 4(–5)-merous; calyx lobes triangular to 1 mm long; petals almost free to the base, triangular, 0.5–1 mm long, glabrous and yellow-green; stamens 4, filaments 1–1.5 mm long; pistillode present, densely hairy. **Pistillate inflorescences** globose heads borne on peduncles arising from tubercles along the mature stems and axils of leaves in younger branches, peduncles 1–3(–4) per axil/tubercle (usually solitary in axils, with more from the tubercles), peduncle stout, pendulous, 3–5 cm long, indumentum as staminate ones. **Pistillate flowers** 4(–5)-merous, calyx segments linear, c. 2 mm long; petals subspathulate, c. 3 mm long; ovary cylindric, apex somewhat contracted into a very short thick style, tomentose, stigmas (2–)3–4, flattish, glabrous, spreading. **Drupes** numerous (c. 60) in spherical clusters; in sicco drupes narrowly ovoid to ovoid-oblongoid, 4–8 × 2–2.5 cm, tapering toward the apex, apex apiculate and recurved and appearing hooked, densely strigose throughout; in vivo with a characteristic chocolate smell, as in sicco except drupes usually oblongoid, 2.5–3.5 cm diam., apex blunt, exocarp coriaceous, pericarp soft and gelatinous, pale yellow; endocarp hard and woody, depressed ovoid, densely foveolate externally, slightly tubercled inside, 3–3.8 × 1.8–2 cm.

Distribution. Found from South-Western and Peninsular Thailand (e.g., Prachuap Khiri Khan, Surat Thani) and throughout western Malesia, i.e., Singapore, Peninsular Malaysia, Sumatra, Borneo (Brunei, Sabah, Sarawak and Kalimantan), and Palawan (Utteridge & Schori, 2011).

Ecology. Throughout its range, *Phytocrene bracteata* has been recorded from primary and secondary forest. This ecological preference is mirrored in Singapore: ‘In a patch of primary forest’ (Leong *et al.* SING2015-198); ‘lowland primary forest with *Koompassia*’ (Leong-Škorničková SING2015-062); ‘open margins of the secondary forest’ (Maxwell 82-320); and ‘secondary forest’ (Maxwell 82-320A).

Provisional IUCN conservation assessment. Globally Least Concern (LC) following IUCN Standards and Petitions Committee (2024) guidelines as this species is widespread with a very large EOO and with recent collections from throughout its distributional range. In Singapore, historic collections, the earliest dating from the late 19th century, place the species across the island; nearly all recent collections have been from the forests in the Central Catchment area. In Singapore Botanic Gardens, the species is cultivated at The Plant House, and flowers and fruits regularly, and seeds have been collected and germinated. However, the species has been assessed as Vulnerable (VU/D) in Singapore based on an estimate of fewer than 1000 plants in the country (Middleton *et al.*, 2024: 485).

Additional specimens examined. SINGAPORE: without locality, Sep. 1867 (stam. fl.), *Maingay* 2670 [Kew distribution no. 377] (K [K004584424]); *ibidem*, 1867–1868 (st.), *Maingay* 2715 [Kew distribution no. 377] (K [K004584425]). **Botanic Gardens:** Behind Corner Bungalow, 17 Apr. 1996 (st.), *Eugene Tang & Hj. Sidek* 1280 (SING [SING0016783]). **Bukit Timah:** without specific locality, 1889 (stam. fl.), *Goodenough s.n.* (SING [SING0018223] – fl. only); Bukit Timah NR, 4 Jun. 1974 (fr.), *Mohd. Noor* 1907 (SING [SING0018225]); Bukit Timah Road, 1907 (stam. fl.), *Ridley s.n.* (SING [SING0018218]); Bukit Timah NR, Fern Valley Stream (Plot 45), 128 m, 28 Aug. 2019 (st.), *Niissalo et al.* SING2019-803 (SING [SING0295558]). **Bukit Panjang:** 24 Feb. 1896 [modern label states 1911] (stam. fl.), *Mat* 5900 (SING [SING0018224]). **Changi:** no date (stam. fl.), without collector [?Ridley] or number (SING [SING0018222]). **Clementi:** Former KTM railway, between Sunset Way and Clementi Woodlands, 15 Nov. 2011 (st.), *Chong & Yee* SW-2 (SING [SING0397390]); Clementi Forest, 2011–2012 (st. juv.), *Neo & Lee* CL2_30 (SING [SING0397377]). **MacRitchie:** MacRitchie Reservoir, Old Shinto Shrine, 15 Dec. 2009 (st.), *Gwee* SING2009-627 (SING [SING0138128]); MacRitchie Reservoir 4, 28 Dec. 2009 (st.), *Gwee* SING2009-752 (SING [SING0144343]); MacRitchie Reservoir, Lornie Trail, 1°20'33"N 103°49'21"E, 16 Dec. 2021 (imm. fr.), *Niissalo & Choo* SING2021-892 (SING [SING0390386]). **Mandai:** Mandai Track 7, 27 Feb. 2015 (st.), *Chong et al.* NSSF2-39 (SING [SING0362822]); Mandai Forest, Mandai 2, 10 Nov. 2009 (stam. fl.), *Gwee et al.* SING2009-448 (SING [SING0138010]); Mandai 1, opposite Garden Nursery, 2 Feb. 2010 (st.), *Gwee* SING2010-264 (SING [SING0144256]); Mandai Road, 1°24'38"N 103°47'12"E, 31 Jul. 2013 (stam. fl.), *Yee et al.* SING2013-254 (SING [SING0203131]). **Nee Soon:** [without locality, but probably plot 9 of R. Meier's climbing plots (K.Y. Chong, pers. comm.)], 3 Dec. 2010 (st.), *Amrita* AS154 (SING [SING0397391]); Nee Soon Swamp Forest, near pipeline, *Samsuri et al.* NES 206 (SING [SING0045885]). **Peirce:** Sector 32 [W edge of Upper Peirce

Reservoir], 14 May 1992 (fr.), *Khng et al. NRS 980* (SING [SING0076906, SING0358337]); Chestnut Peninsula, 1 Jul. 2015 (st.), *Leong et al. SING2015-198* (SING [SING0226596]); Off of the road to Upper Peirce Reservoir near the pipeline, 19 Aug. 1982 (fr.), *Maxwell 82-230* (L [L.2289360, L.2289361], SING [SING0018215, SING0018217]); ibidem, 19 Aug. 1982 (st.), *Maxwell 82-230A* (L [L.2289359], SING [SING0018216]). **Seletar:** Sector 10 [NW side of Upper Seletar Reservoir], 5 May 1992 (imm. fr.), *Khng et al. NRS 714* (SING [SING0362818, SING0362819, SING0362820, SING0362821]); Seletar Track, 1°23'35"N 103°48'10"E, 2 Mar. 2015 (stam. fl.), *Leong-Škorničková SING2015-062* (SING [SING0213802]); North end of Seletar Reservoir, at 11½ miles Mandai Road, 15 Sep. 1951 (stam. fl.), *Sinclair s.n.* (L [L.2289365]). **Tanglin:** Cluny Road at the corner to Dalvey Road junction, 12 Jul. 1966 (stam. fl.), *Sidek b. Kiah MS 1191* (SING [SING0018214]); 'Swamp Tanglin', 1891 (st.), *Ridley s.n.* (SING [SING0018219]); Cluny Road, 1899 (fr.), *Ridley 10359* (K [K004584426], SING [SING0018221]). **Tanjong Katong:** Tanjong Katong, jungle by Road to Siglap, 4 Apr. 1893 (stam. fl.), *Hullett 7* (SING [SING0018220]).

Field notes. 'Woody climber, cut stems dripping a liquid; infructescences on lower stems, globose; fruits golden-brown, mesocarp white, juicy, slightly sweet taste, testa black; blades dark green above, grey-green below; fruit hairs slightly irritating' (*Maxwell 82-230*); 'liana with male inflorescence of a dirty yellow ochre' (*Leong-Škorničková SING2015-062*); 'Young climber to 1.5 m tall' (*Niissalo et al. SING2019-803*); '[staminate] flowers hanging down, creamish-green with tiny black hairs' (*Sidek b. Kiah MS 1191*).

Notes. *Phytocrene bracteata* was first described by Wallich (1831) from material collected by Porter from Prince of Wales Island (Penang). There are several Porter specimens from Penang which can be considered original material that would have been seen by Wallich, either deposited or distributed from the East India Company Herbarium, and now found in different herbaria. Sleumer (1969: 238), in his list of specimens, cited 'Porter in Herb. Wallich n. 4947 (... K, type of *P. bracteata*; ...)'. We can assume that 'Herb. Wallich' refers to the East India Company Herbarium (EICH; kept as a separate collection at the Herbarium of the Royal Botanic Gardens, Kew and commonly called the Wallich Herbarium), and 'n. 4947' is referring to the Numerical List number used by Wallich in his Catalogue to the collection (Wallich, 1828b). There are two sheets of *Porter s.n.* in the EICH, both with the Numerical List no. 4947: K001104280 and K001104281, and both with determination slips as "*Phytocrene bracteata* Wall. holotype, Sleumer '67". There is no indication, however, that these are explicitly a single gathering, and we have designated the more complete sheet with both young and mature flowers, as well as more developed and longer inflorescences, as the second-step lectotype (K001104281). The material in the general collection at Kew was stamped as seen by Sleumer in 1967, and annotated by him as 'Isotype' (K000700061), 'prob. Isotype' (K000700060), and '(iso) type' (K000700059). Note, in the general collection, the Porter material (K000700059) on the lower portion of K-Herb. Hooker specimen, is mounted with a Griffith collection from Myanmar (K000700058), which is not part of the type material.

The leaves of *Phytocrene bracteata* exhibit three different morphological types (Fig. 1), with some overlap between each type: 1) young leaves on juvenile/sterile plants which are chartaceous, ovate to 3-lobed with entire to serrulate margins (e.g., *Leong et al. SING2015-198*); 2) mature (?shade) leaves on juvenile/sterile plants which are coriaceous, large (to 30 cm long) and deeply 5-lobed (e.g., *Gwee SING2010-264*); 3) mature leaves on adult/fertile plants which are coriaceous, broadly ovate and unlobed to slightly lobed (e.g., *Yee et al. SING2013-254*). Liana leaves are well known to exhibit ontogenetic changes (e.g., Givnish & Vermeij, 1976), in response to light and ensuring photosynthetic and structural efficiency, but further studies are needed to understand the environmental or ontogenetic drivers of the different leaf morphologies of *Phytocrene bracteata*. At Singapore Botanic Gardens, a large and vigorous living pistillate specimen of *Phytocrene bracteata* grows over the Plant House, and flowers and fruits continuously. Pollination and floral visitors and the proximity of a staminate plant, or potential apomixis, has not been established. The young leaves of this fertile plant are allometrically scaled down versions of the mature, ovate and unlobed leaves, even in the sun or shade; i.e., the age and reproductive stage of the plant may dictate leaf size and shape as much as, or in addition to, environmental factors.

2. *Phytocrene oblonga* Wall., Pl. Asiat. Rar. 3: 12 (1831). – *Gynocephalum oblongum* (Wall.) Trecul, Ann. Sc. Nat. III, 8 (1847) 149. – TYPE: Malaysia, Penang, 1822 (stam. fl.), *Porter s.n.* [Wall. Cat. no. 4948] (lectotype K-W [K001104282], designated here). (Figs 4, 5)

Miquelia cancellata Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 44: 201 (1875). – TYPE: Malaysia, Malacca, 1865–1866 (fr.), *Maingay 1849* [Kew distribution no. 376] (lectotype CAL [CAL0000007019], designated here; isoelectotypes K [K000700063, K000700064], L [L.2289594]).

[Leaves and staminate inflorescences and flowers from Singapore material; habit length, branchlets, pistillate floral parts and fruits fide Sleumer (1971: 84)]

Woody climber (length not recorded in Singapore but to ‘tops of trees’ and 25 m across the range); stem slender, up to 1 cm diam.; bark grey-brown, with scattered elongate lenticels. **Branchlets** glabrous but densely set with fine retrorse prickly lenticels. **Leaves** spirally arranged, evenly spaced along the stem, sometimes leaving a distinct raised discoid scar after dehiscence; petiole 2–2.5 cm long, glabrous, warty and longitudinally furrowed; leaf blade elliptic to obovate (in Singapore material), 12.5–15.8 × 5.6–7.5 cm, coriaceous, apex shortly acuminate, acumen triangular and less than 0.6 cm long, base cuneate, margins entire or slightly undulate, mature leaves glabrous above, very sparsely stiffly hairy on midrib and venation below; secondary veins 7–8 pairs, brochidodromous, basal pair ascending and giving a triplinerved appearance, tertiary veins percurrent to reticulate, adaxial venation obscure to slightly raised, abaxially secondary veins and higher orders conspicuously raised and

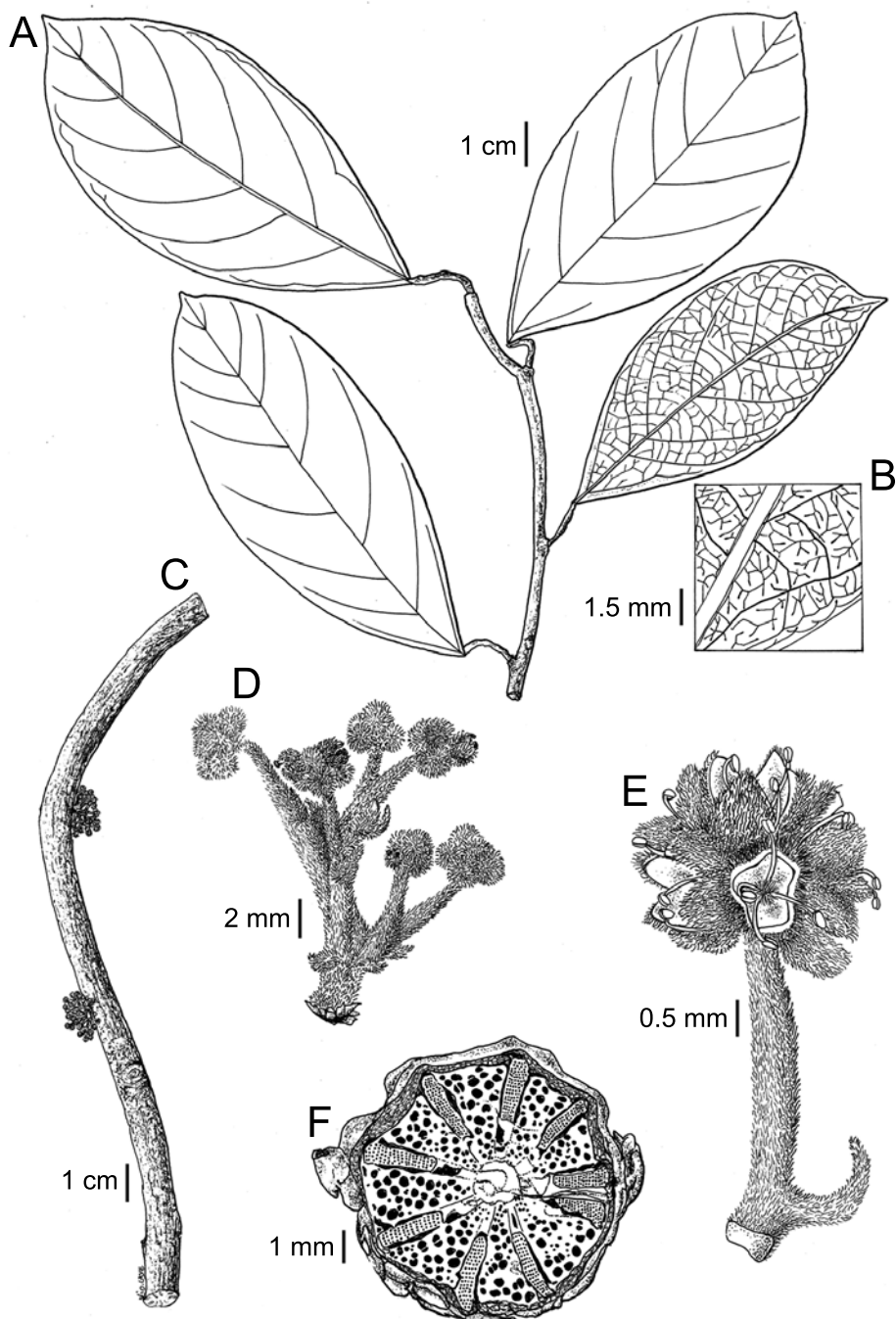


Fig. 4. *Phytocrene oblonga* Wall. **A.** Habit. **B.** Detail of tertiary venation. **C.** Stem with ramiflorous inflorescences. **D.** Inflorescence. **E.** Detail of first order inflorescence branch. **F.** Stem cross section. All from Leong *et al.* SING2011-044. Drawn by Violette Chye.



Fig. 5. *Phytocrene oblonga* Wall. **A.** Habit, note ramiflorous staminate inflorescences (ruler is 20 cm/8 inches). **B.** Detail of stem and staminate inflorescence, note the open flowers at the distal end of each inflorescence branch. (Photos: P. Leong)

drying sandy-brown. Plants dioecious. ***Staminate inflorescences*** clustered on woody tubercles on the stem (in Singapore material), consisting of numerous few-flowered umbellules, densely rusty hispid hairy throughout, peduncle to 1 cm long, first order branches up to 8 mm long, subtended by a subulate bract up to 2 mm long. ***Staminate flowers*** 4(–5)-merous; calyx lobes triangular to 1 mm long; petals almost free to the base, triangular, 0.5–1 mm long, glabrous and yellow-green; stamens 4, filaments 1–1.5 mm long; pistillode present, densely hispid hairy. ***Pistillate inflorescences*** with flowers (often diseased) in peduncled globose heads on stem and branches, peduncle stout, set with subulate bracts, c. 1 cm long, indumentum as staminate ones. ***Pistillate flowers*** 4(–5)-merous, calyx segments linear, c. 2 mm long; petals subspathulate, c. 3 mm long; ovary cylindric, apex somewhat contracted into a very short thick style, tomentose, stigmas (2–)3–4, flattish, glabrous, spreading. ***Drupes*** in globular orange coloured clusters 6–9(–11) cm diam., each drupe ovoid to ovoid-oblongoid, obtuse, the very apex only slightly apiculate by the style, covered especially in the upper part with stout straight reddish-brown subulate prickles (5–8 mm long) which after falling

leave numerous circular pits (c. 1 mm diam.) in the endocarp, (3–)3.5(–4) × 2–2.5 cm including the prickles; exocarp coriaceous; endocarp crustaceous, slightly tubercled inside, c. 2.5 × 1.5 cm.

Distribution. Myanmar, Peninsular Malaysia, Thailand and Vietnam.

Ecology. Recorded from lowland forests up to 150 m.

Provisional IUCN conservation assessment. Globally Least Concern (LC) following IUCN Standards and Petitions Committee (2024) guidelines as this species is widespread with a very large EOO. In Singapore, the species is known from a single recent collection from 2011; the species was assessed as Critically Endangered (CR/D) based on an estimate of fewer than 50 mature individuals in the country (Middleton et al., 2024: 485). A particular problem with dioecious plants, including *Phytocrene oblonga*, is that pistillate individuals are needed to set fruit and, to date, only a staminate individual has been collected in Singapore. The practicalities of conserving unisexual plants was discussed for the dioecious climber *Cocculus orbiculatus* (L.) DC. (Menispermaceae), a species now conserved in Singapore through the National Parks Board's Species Recovery Programme (see Lim et al., 2019: 87 & figure on p. 91). Thought to be extinct in Singapore, a population with staminate flowers was rediscovered on Coney Island and subsequently brought into cultivation from cuttings. Only when these staminate plants were grown in close proximity to pistillate plants (grown from cuttings from Thailand), were fruits developed to maturity and plants then grown from seed.

Additional specimen examined. SINGAPORE: **Nee Soon:** Nee Soon Pipeline, 21 Feb. 2011, *Leong et al. SING2011-044* (SING [SING0171375]).

Field notes. 'Woody climber; stem grey-brown, bark fissured; leaves thick, leathery, dull dark green and bullate above, pale green and mildly sand-papery below; inflorescence appearing on the bare stem below leaves, covered with brown pubescent hairs, petals yellow' (*Leong et al. SING2011-044*). The collecting ticket on the type specimen from Penang states 'A climber from the Hills. Fl. a reddish brown. When cut a quantity of milk oozed out' (*Porter s.n.*).

Notes. *Phytocrene oblonga* is currently known from Singapore, Peninsular Malaysia and continental Southeast Asia, but not yet from other parts of Malesia—the Singapore collection appears to represent the most southerly distribution of this species. Until the collection from the Nee Soon Pipeline in 2011, the species was not recorded from Singapore. Despite Singapore being comparatively very well collected within Malesia (see Middleton et al., 2019), activities toward the Flora of Singapore programme, including additional fieldwork, collecting and critical re-appraisal and identification of herbarium material, has resulted in 150 additional species added to the flora of the island in a 14-year period from 2009–2023 (Neo et al., 2024). Climbing taxa, especially

lianas reaching the canopy, were highlighted by Neo et al. (2024) as one of the groups previously overlooked by previous botanists and requiring specialist attention. In the Icacinaceae, a new monotypic genus of canopy climber has been described relatively recently from material from primary rainforest in Borneo (Utteridge et al., 2005).

We have only been able to trace a single specimen of the original material referred to in the protologue (Porter's collection from Penang, as Prince of Wales Island). However, the protologue did not explicitly state there was only a single specimen, nor was one particular herbarium indicated, and therefore we lectotypify the name based on the single specimen in the EICH at Kew (following McNeill, 2014).

The Maingay material was distributed from Kew under the number '376', and this was cited in the protologue by Kurz (1875: 202), as only the Kew distribution slip (lacking the collecting number) is present on the CAL sheet. The material in CAL is selected as the lectotype as Kurz was curator of Calcutta Herbarium from 1864 and would have seen this material.

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References

- Blume, C.L. (1825). *Bijdragen tot de Flora van Nederlandsch Indië*. Batavia: Ter Lands Drukkerij.
- Byng, J.W., Bernardini, B., Joseph, J.A., Chase, M.W. & Utteridge, T.M.A. (2014). Phylogenetic relationships of Icacinaceae s.s. focusing on the vining genera. *Bot. J. Linn. Soc.* 176: 277–294.
- Givnish, T.J. & Vermeij, G.J. (1976). Sizes and shapes of liane leaves. *Amer. Nat.* 110: 743–778.
- Hickey, L.J. (1979). A revised classification of the architecture of dicotyledonous leaves. In: Metcalfe, C.R. & Chalk, L. (eds), *Anatomy of the Dicotyledons*, pp. 25–39. Oxford: Clarendon Press.
- IUCN Standards and Petitions Committee (2024). *Guidelines for Using the IUCN Red List Categories and Criteria*. Version 16. Prepared by the Standards and Petitions Committee. Available from <https://iucnredlist.org/documents/RedListGuidelines.pdf>
- Kurz, W.S. (1875). Descriptions of Indian plants. *J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist.* 44: 199–206.
- Lim, R.C.J., Leong-Škorničková, J., Lindsay, S., Niissalo, M.A., Yam, T.W. & Middleton, D.J. (2019). Plant conservation in Singapore II: Practical conservation. In: Middleton, D.J., Leong-Škorničková, J. & Lindsay, S. (eds), *Flora of Singapore*, vol. 1, Introduction, pp. 83–106. Singapore: National Parks Board.
- Lindsay, S., Middleton, D.J., Ho, B.C., Chong, K.Y., Turner, I.M., Ibrahim, A., Alonso-García, M., Ang, W.F., Ashton, P.S., Athen, P. et al. (2022). Flora of Singapore: Checklist and bibliography. *Gard. Bull. Singapore* 74(Suppl. 1): 3–860.

- McNeill, J. (2014). Holotype specimens and type citations: General issues. *Taxon* 63: 1112–1113.
- Middleton, D.J., Armstrong, K., Baba, Y., Balslev, H., Chayamarit, K., Chung, R.C.K., Conn, B.J., Fernando, E.S., Fujikawa, K., Kiew, R. et al. (2019). Progress on Southeast Asia's Flora projects. *Gard. Bull. Singapore* 71(2): 267–319.
- Middleton, D.J., Lindsay, S., Ho, B.C., Chong, K.Y., Athen, P., Ibrahim, B., Chen, J., Chen, L.M.J., Choo, L.M., Gan, J.W.M. et al. (2024). Checklist of flora species with their category of threat status for Singapore. In: Davison, G.W.H., Gan, J.W.M., Huang, D., Hwang, W.S., Lum, S.K.Y. & Yeo, D.C.J. (eds), *The Singapore Red Data Book: Red Lists of Singapore Biodiversity*, 3rd ed., pp. 454–514. Singapore: National Parks Board.
- Neo, L., Chong, K.Y., Lindsay, S., Middleton, D.J., Tan, P.Y. & Er, K.B.H. (2024). A botanical oasis rather than a biological desert: Rediscoveries, new species and new records in a tropical city. *Plants, People, Planet* 6: 697–709.
- Peng, H. & Howard, R.A. (2008). Icacinaceae. In: Wu, Z., Raven, P.H. & Hong, D. (eds), *Flora of China*, vol. 11, pp. 505–514. Beijing: Science Press & St. Louis: Missouri Botanical Garden.
- Potgieter, M., Schori, M. & Utteridge, T.M.A. (2016). Stemonuraceae. In: Kadereit, J. & Bittrich, V. (eds), *Families and Genera of Vascular Plants*, vol. 4, pp. 367–376. Berlin: Springer-Verlag.
- POWO (2024). *Plants of the World Online*. Facilitated by the Royal Botanic Gardens, Kew. <https://powo.science.kew.org>. Accessed 17 Sep. 2024.
- Sleumer, H. (1968). (237) Proposal for the Conservation of the Generic Name 4712. *Phytocrene* Wallich 1831 (Icacinaceae) vs *Gynoecephalum* Blume 1825 (Icacinaceae). *Taxon* 17: 448–449.
- Sleumer, H. (1969). Materials towards the knowledge of the Icacinaceae of Asia, Malesia, and adjacent areas. *Blumea* 17: 181–264.
- Sleumer, H. (1970). Icacinaceae. In: Smitinand, T. & Larsen, K. (eds), *Flora of Thailand*, vol. 2, pt. 1, pp. 75–92. Bangkok: Applied Scientific Research Corporation of Thailand.
- Sleumer, H. (1971). Icacinaceae. In: van Steenis, C.G.G.J. (ed.), *Flora Malesiana*, ser. I, Spermatophyta, vol. 7, pp. 1–87. The Netherlands, Leyden: Noordhoff International Publishing.
- Stull, G.W., Soltis, P.S., Soltis, D.E., Gitzendanner, M.A. & Smith, S.A. (2020). Nuclear phylogenomic analyses of asterids conflict with plastome trees and support novel relationships among major lineages. *Amer. J. Bot.* 107: 1–16.
- Systematics Association Committee (1962). Terminology of simple symmetrical plane shapes (chart 1). *Taxon* 11: 145–156 & 245–247.
- Utteridge, T.M.A. & Schori, M. (2011). Updating Malesian Icacinaceae. *Gard. Bull. Singapore* 63: 105–118.
- Utteridge, T.M.A., Nagamasu, H., Teo, S.P., White, L.C. & Gasson, P. (2005). *Sleumeria* (Icacinaceae): A new genus from northern Borneo. *Syst. Bot.* 30(3): 635–643
- Wallich, N. (1828a). [Letter to H.T. Colebrooke quoted in:] XXXVII Proceedings of Learned Societies. Linnaean Society. *Philos. Mag. Ann. Chem.* 3: 223.
- Wallich, N. (1828b). *A Numerical List of dried specimens of plants in the East India Company's Museum, collected under the superintendence of Dr. Wallich of the Company's Botanic Garden at Calcutta (1829[as 1828]–1849)*. London.
- Wallich, N. (1831). *Plantae Asiaticae Rariores: or, Descriptions and figures of a select number of unpublished East Indian plants*, vol. III. London: Treuttel and Würtz, and Richter.

