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Additions to the Flora of Singapore: New and overlooked records of casual and naturalised plant species (6)

D.J. Middleton[1], S. Atkins[2], H.J. Beentje[3], L.M.J. Chen[1], L.M. Choo[1], R.P.J. de Kok[4], W.J.J.O. de Wilde[5], B.E.E. Duyfjes[5], B.C. Ho[1], S. Lindsay[6] & H.K. Lua[7]

[1]Singapore Botanic Gardens, National Parks Board,
1 Cluny Road, Singapore 259569, Singapore
david_middleton@nparks.gov.sg
[2]Royal Botanic Garden Edinburgh, 20a Inverleith Row,
Edinburgh EH3 5LR, Scotland, UK
[3]Royal Botanic Gardens, Kew, Richmond,
Surrey, TW9 3AE, England, UK
[4]Honorary Research Associate, Singapore Botanic Gardens,
National Parks Board, 1 Cluny Road, Singapore 259569, Singapore
[5]Naturalis Biodiversity Center, section Botany, P.O. Box 9517,
2300 RA Leiden, The Netherlands
[6]Native Plant Centre, Horticulture and Community Gardening Division,
National Parks Board, 100K Pasir Panjang Road, Singapore 118526, Singapore
[7]National Biodiversity Centre, National Parks Board,
1 Cluny Road, Singapore 259569, Singapore

ABSTRACT. Nine non-indigenous casual or naturalised species are newly recorded for Singapore: *Justicia pectinata* L. (Acanthaceae), *Lepidagathis cephalotes* (Link) Kuntze (Acanthaceae), *Ruellia prostrata* Poir. (Acanthaceae), *Acmella ciliata* (Kunth) Cass. (Asteraceae), *Tilesia baccata* (L.) Pruski (Asteraceae), *Wollastonia asperrima* Decne. (Asteraceae), *Merremia gemella* (Burm.f.) Hallier f. (Convolvulaceae), *Momordica cochinchinensis* (Lour.) Spreng. (Cucurbitaceae) and *Verbena brasiliensis* Vell. (Verbenaceae). Descriptions, notes on the distribution, and ecology are provided for all species, while colour plates are provided for four species.

Keywords. Acanthaceae, Asteraceae, Convolvulaceae, Cucurbitaceae, Verbenaceae

Introduction

This paper belongs to a series dealing with the naturalised flora of Singapore to better document its diversity and to set baseline data so as to monitor its presence in various environments within Singapore and track whether any introduced species could become a threat to native species. So far, 28 species have been added to the non-indigenous species of Singapore in the first five parts of this series (Chen et al., 2018a,b, 2020, 2021; Choo et al., 2020). In this new part, we enumerate nine additional non-indigenous species which have been found in the field and/or herbarium and are confirmed by ongoing taxonomic work for the *Flora of Singapore* project. We use

the terminology of Pyšek et al. (2004) for definitions of non-native species although we also highlight species which we record as casual in Singapore based on specimen evidence but which have not been seen in the wild in more than 30 years. Singapore has relatively few unmanaged landscapes and introduced species which have qualified as casual (Pyšek et al., 2004) may nevertheless subsequently have been extirpated. The descriptions below have generally been written from a combination of the Singapore material along with material from the wider region due to the scarcity of material from Singapore to adequately reflect the variation of each species.

Acanthaceae

1. *Justicia pectinata* L., Cent. Pl. II: 3 (1756). – *Rungia pectinata* (L.) Nees in A.DC., Prodr. 11: 470 (1847). – *Rungia parviflora* Nees subsp. *pectinata* (L.) L.H.Cramer in M.D. Dassanayake & W.D. Clayton (ed.), Revis. Handb. Fl. Ceylon 12: 105 (1998). – TYPE: India, *Unknown s.n.* (lectotype LINN [Herb. Linn. no. 28.17], designated by Cramer in Dassanayake & Clayton, Revis. Handb. Fl. Ceylon 12: 105 (1998)).

Herb 20–50 cm tall, prostrate, rooting at nodes then erect, annual or perennial. ***Stem*** slender, 0.6–1.2 mm thick, sparsely hairy. ***Leaves*** opposite, cystoliths curved; lamina oblong-elliptic, 1–4 × 0.4–1.4 cm, base cuneate and decurrent onto petiole, apex acute to acuminate, margin entire, penninerved, secondary veins 2–4, upper surface glabrous, lower surface glabrous, except for a few hairs on midrib; petiole channelled, 0–7 mm; slender, sparsely hairy. ***Inflorescence*** a spike, axillary or terminal, 0.5–2 cm long, sparsely hairy; bracts dimorphic; sterile bracts green, lanceolate, 4–5.5 × 0.7–0.9 mm, apex acute, sparsely hairy; fertile bracts lanceolate, 3.8–5 × 0.7–0.9 mm, apex acute to acuminate, sparsely hairy, margin broadly hyaline; bracteoles lanceolate, 2–3 mm long, margin ciliate, apex acute. ***Flowers:*** calyx 5-lobed, sparsely hairy, lobes linear-lanceolate, 2.4–3 × 0.2–0.5 mm, apex acute, margin narrowly hyaline; corolla blue or white, outside very sparsely hairy, tube 2–3 mm long, lower lip 1–1.6 × 2–2.2 mm, apex rounded, upper lip ovate, 1–2 × 0.6–0.7 mm, apex emarginate; stamens 4, 1.5–2.4 mm long, glabrous but hairy at base, anthers c. 0.6 mm long, glabrous, spurred; ovary c. 0.7 mm long, glabrous, style c. 3.3 mm long, stigma capitate. ***Fruit*** capsule ellipsoid, 2.5–4.3 × 1.4–1.6 mm, apex acute, smooth, glabrous; seeds 2 or 4, orbicular in outline, c. 1 mm diam., minutely verrucose.

Distribution. Sri Lanka, India, Nepal, Bhutan, Bangladesh, Myanmar, South China, South to Vietnam, Laos and Thailand. In Singapore it is naturalised.

Ecology. Growing in wastelands and disturbed habitats.

Specimens examined. SINGAPORE: **Farrer Road:** 22 Mar 2007, *Koh s.n.* (SING [SING0096331]). **Bukit Batok:** Bukit Batok Road, 1 Mar 2018, *Ho SING2018-494* (SING [SING0245354]). **Pasir Panjang:** Pasir Panjang Road, 5 Mar 2018, *Ho & Koh SING2018-242* (SING [SING0245342]).

2. *Lepidagathis cephalotes* (Link) Kuntze, Revis. Gen. Pl. 2: 492 (1891). – *Hypoestes cephalotes* Link, Jahrb. Gewächsk. 1(3): 48 (1820). – TYPE: [India], *Roxburgh s.n.* (lectotype B-W [B-W00302-000], designated here). (Fig. 1)

Herb 30–100 cm tall, base sometimes woody. ***Stems*** slender, 0.9–1.5 mm thick, 4-angled in cross-section, slightly shrunken at nodes when dried, sparsely hairy, denser at nodes, glabrescent. ***Leaves*** opposite, anisophyllous, cystoliths linear; lamina ovate to (narrowly) elliptic, 2.5–11 × 1–4.5 cm, base cuneate to attenuate, apex acute to shortly acuminate, margin entire to wavy, penninerved, secondary veins 4–9 pairs, tertiary veins reticulate, upper surface glabrous, lower surface glabrous; petiole channelled, 5–35 mm, slender, glabrous. ***Inflorescence*** an elongated spike, 1–4 cm long, sparsely hairy; bracts and bracteoles green when young, later brown, oblong-lanceolate, 4–10 × 1.5–2 mm, apex long acuminate, sparely hairy with glandular and non-glandular hairs. ***Flowers:*** calyx 5-lobed, lobes oblong-lanceolate, unequal, apex acuminate, sparsely hairy with glandular and non-glandular hairs, posterior lobes 8–9 × 1.5–1.7 mm, 3-veined, lateral lobes 6–7.5 × 0.7–0.8 mm; corolla white streaked with purple, outside sparsely pubescent, tube 4.6–5 mm long, upper lip 2-lobed, erect, lobes oblong, 1.1–1.3 × 0.7–0.8 mm, apex acute to rounded, lower lip 3-lobed, recurved, lobes oblong, 1.5–3 × 1.3–1.8 mm, apex rounded; stamens c. 2 mm long, sparsely hairy, inserted at tube mouth, exceeding the tube, anthers c. 0.4 mm long; ovary ovoid, c. 1.1 mm long, sparsely hairy at apex, style c. 2 mm long, glabrous, stigma capitate. ***Fruit*** a capsule 5–6 × c. 1.5 mm, apex acuminate, smooth, sparely hairy at apex; seeds 4, discoid, 0.9–1.8 mm diam., smooth, glabrous.

Distribution. Native to India, Bangladesh, Myanmar, South China and Thailand. In Singapore it is naturalised. The species is likely to be spread through the movement of horticultural material as recent collections were made from plants found as weeds in grass verges and planting beds.

Ecology. Across its native and introduced range, growing in thickets, grasslands, hedgerows, roadsides, streams sides and drains and as a weed in flower beds, between 0–2200 m altitude.

Specimens examined. SINGAPORE: without locality, s.d., *Unknown s.n.* (SING [SING0056893]). **Pasir Panjang:** Pasir Panjang Nursery, 24 Oct 2017, *Niissalo et al. SING2017-546* (SING [SING0245356]); Pasir Panjang Road, 6 Dec 2017, *Chen SING2017-731* (SING [SING0245359]). **Tanglin:** Singapore Botanic Gardens, 23 May 2018, *Chen SING2018-021* (SING [SING0267391]).

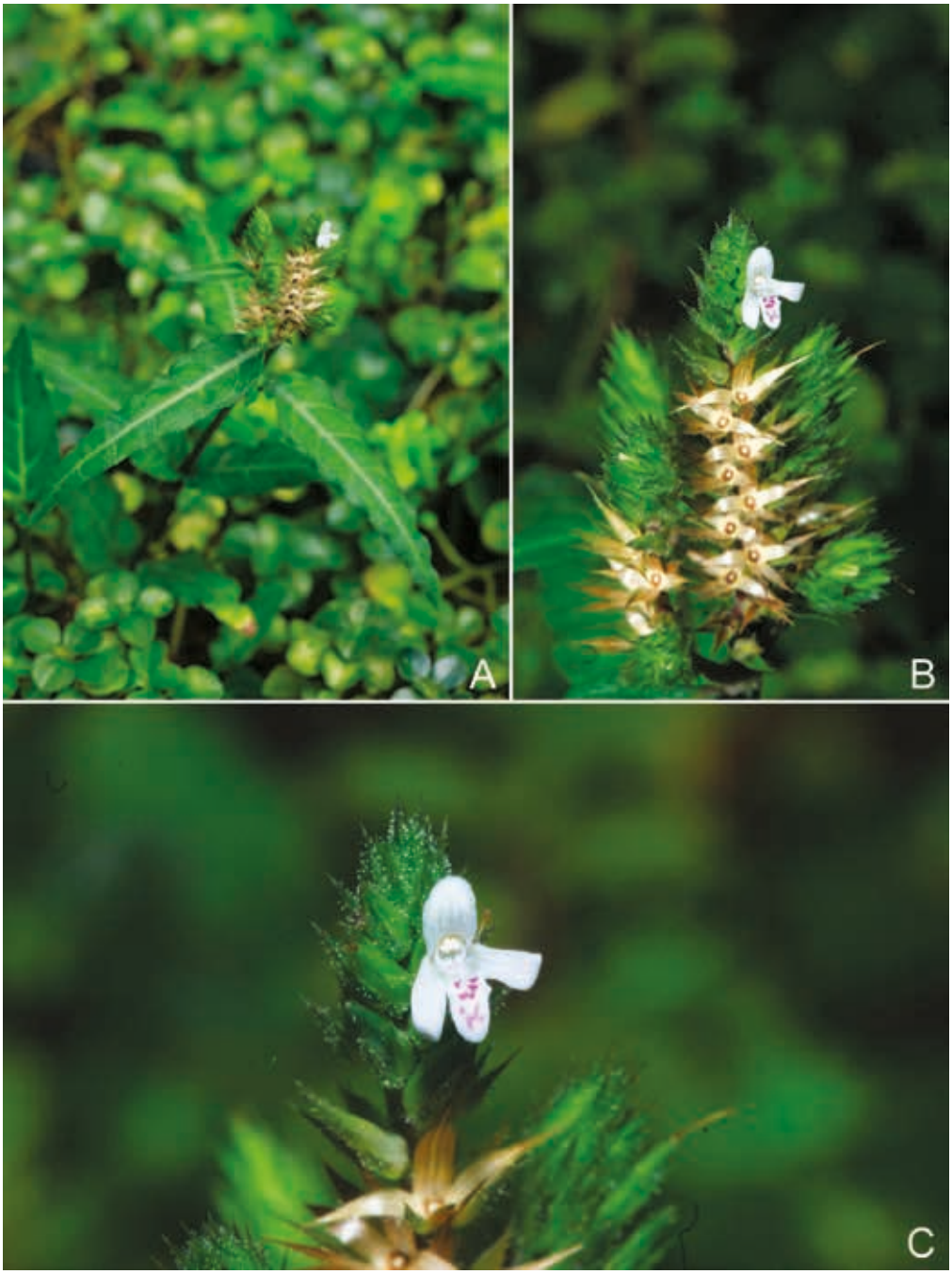

Fig. 1. *Lepidagathis cephalotes* (Link) Kuntze. **A.** Habit. **B.** Inflorescence with opened flower. **C.** Close up of flower. All from *Chen SING2017-731*. (Photos: L.M.J. Chen)

3. *Ruellia prostrata* Poir., Encycl. 6: 349 (1804); Ridley, Fl. Malay Penins. 2: 564 (1923). – *Dipteracanthus prostratus* (Poir.) Nees., Pl. Asiat. Rar. 3: 81 (1832); Bremekamp & Nanninga-Bremekamp, Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Sect. 2, 45: 16 (1948). – TYPE: India, *Dupuis s.n.* (not found). (Fig. 2)

Herb, sometimes woody at base, 8–11 cm tall, creeping to rarely erect, sometimes rooting at the nodes, perennial, roots without tuber-like swellings. ***Stems*** slender, 0.8–1.1 mm thick, angular in cross-section, not swollen or shrunken when dried, sparsely hairy; hairs yellowish, erect. ***Leaves*** opposite, cystoliths linear; lamina elliptic, 1–4 × 0.5–2.2 cm, base attenuate, apex acute, margin entire, penninerved, secondary veins 4–6 pairs, curved near margins, tertiary veins scalariform-reticulate, upper surface sparsely hairy, lower surface sparsely hairy; petiole channelled, 4.3–12 mm long, slender, sparsely hairy. ***Inflorescences*** solitary, rarely clustered, 15–23 mm long, axillary, bracts elliptic, 10–40 × 5–22 mm, apex acute; bracteoles absent. ***Flowers:*** calyx 5-lobed, sparsely hairy, tube 1–1.5 mm long, lobes lanceolate, 5–6.5 × 0.9–1.4 mm, apex acuminate, sparsely hairy; corolla white to pale lilac, outside sparsely hairy with non-glandular hairs, tube 16–30 mm long, 1.7–1.8 mm wide at base and gradually widened to 8–10 mm at mouth, lobes 5, ovate, 5.5–9 × 6–8 mm, apex rounded; stamens glabrous, included in corolla tube, inserted on corolla tube, longer pair 6.3–8 mm long, shorter pair 3–4.5 mm long, glabrous, anthers 1.6–2 mm long, glabrous; ovary c. 1.7 mm long, sparsely hairy, style c. 15 mm long, sparsely hairy, stigma lobes unequal. ***Fruit*** a capsule, oblanceolate, 18–24 × 4–5 mm, apex acute, smooth, glabrous to finely velvety; seeds 4, discoid, 2.5–3 mm diam., smooth, margin with a conspicuous band of appressed hygroscopic trichomes.

Distribution. Tropical and subtropical Africa, Yemen, Oman, India, Sri Lanka, Peninsular Malaysia, Java, New Guinea and the western Pacific Islands. In Singapore it is treated as naturalised.

Ecology. Across its range it grows in grasslands, gardens, woodlands and along roadsides up to 1500 m altitude.

Specimens examined. SINGAPORE: **Changi:** New Upper Changi Road, 4 Jan 2017, *Loh SING2017-003* (SING [SING0253240, SING0258543]). **Hougang:** Hougang Avenue 10, 28 May 2018, *Ho & Yeo LCMJ 2018-061* (SING [SING0267392]). **East Coast Park:** grass verge near Carpark B1, 24 Sep 2021, *Chen et al. LCMJ 2021-010* (SING [SING0267393]).

Asteraceae/Compositae

4. *Acmella ciliata* (Kunth) Cass., Dict. Sci. Nat., ed. 2, 24: 331 (1822); Jansen, Syst. Bot. Monogr. 8: 36 (1985). – *Spilanthes ciliata* Kunth, Nov. Gen. Sp., ed. fol., 4: 163 (1818). – TYPE: Colombia, near Chipio and Santa Fe de Bogota, *Bonpland s.n.* (holotype P-HBK).

Perennial herb to 60 cm high. ***Stems*** decumbent or ascending, rooting at nodes, reddish in parts, glabrous to sparsely pilose. ***Leaves*** with petiole 7–40 mm long; lamina ovate, 2–7.5 × 1–6 cm, base truncate or cordate, apex acute, margin denticulate or dentate, glabrous or sparsely pilose. ***Heads*** terminal or axillary, solitary, 6–10 mm high, to 9 mm diam.; phyllaries 7–10, 2-seriate, 3–7 × 1–3 mm; receptacle 4–7 mm high. ***Ray florets*** 5–10, yellow-orange, limb 1–5 × 1–3 mm. ***Disc florets*** 90–180, yellow-orange, 1.5–2 mm long; anthers black. ***Achenes*** 1.5–2 × 0.5–1 mm, black, with corky margin, ciliate; pappus usually absent or sometimes of 2 short bristles 0.2–1 mm long.

Distribution. Originally from South America, introduced into various parts of Asia. In Singapore there are doubtful records (due to poor material) from 1933 and 1934 and a more recent unequivocal record.

Ecology. In Singapore casual and most recently collected from a periodically inundated and waterlogged area in a park, where it grows alongside other introduced exotic species such as *Colocasia esculenta* (L.) Schott and *Justicia comata* (L.) Lam.

Specimens examined. SINGAPORE: **Bras Basah Road:** 10 Jan 1933, *Teruya 2189* (SING [SING0190795]). **Geylang:** 5 Mile Geylang, 27 Jul 1934, *Teruya 2524* (SING [SING0139055, SING0190960]). **Bishan:** Bishan Park, Feb 2018, *Chen SING2018-138* (SING [SING0245388]).

5. *Tilesia baccata* (L.) Pruski, Novon 6(4): 414 (1996). – *Coreopsis baccata* L., Pl. Surin. 14 (1775). – TYPE: [Suriname], Herb. Linn. 1026.7 (lectotype LINN, designated by D'Arcy, Ann. Miss. Bot. Gard. 62: 1170 (1975)).

Perennial herb, shrub or climber, to 5 m high; stems scabridulous. ***Leaves*** opposite; petiole 0.4–2 cm long; lamina ovate, to 15 × 7 cm, base rounded, obtuse or attenuate, apex acuminate, margin obscurely dentate or crenate, 3–5-veined from base, scabridulous. ***Heads*** in a terminal group of few to several, with leafy bracts; phyllaries obovate, 3–4 × 2–4 mm; receptacle paleate, the paleae green, 6 mm long, with callose orange tips. ***Ray florets*** several, orange or yellow, limb ovate-oblong, 10–15 × 4 mm. ***Disc florets*** many, orange, c. 7 mm long; stamens blackish-purple with yellow appendages. ***Achenes*** black, oblong, c. 5 mm long, plump, obscurely 4-angled, often fleshy, glabrous except for the apex; pappus absent.

Distribution. Tropical America. In Singapore it is historically casual.

Ecology. In its native distribution this species occurs in forests. It appears not to be generally known as escaping in Asia but in Singapore it was reportedly found in a ditch, where it was said to be common. However, it is treated here as historically casual because it has not been recollected from the wild since 1952.

Specimens examined. SINGAPORE: **Tanglin:** Tyersall Avenue, 19 Feb 1952, *Sinclair SFN 39438* (SING [SING0190814]).

Fig. 2. *Ruellia prostrata* Poir. **A.** Habit. **B.** Close up of flower, with a green fruit on the left. All from *Chen et al. LCMJ 2021-010,* photographed at East Coast Park. (Photos: L.M.J. Chen)

6. *Wollastonia asperrima* Decne., Nouv. Ann. Mus. Hist. Nat. 3: 414 (1834). – *Lipoblepharis asperrima* (Decne.) Orchard, Nuytsia 23: 446 (2013). – TYPE: [Timor], *Unknown s.n.* (holotype P [P02515133]).

Shrub or perennial herb, 0.3–1 m high. ***Leaves*** green, narrowly ovate to lanceolate, 4–10 × 1–3.5 cm, base subauriculate, margin serrate, apex acute, scabrid on both surfaces. ***Capitula*** in stalked few-headed panicles, on individual stalks 4–6 cm long; phyllaries lanceolate, the outer slightly longer, appressed-hairy; paleae straw-coloured or yellow/red, lanceolate, acute, conduplicate, scabridulous. ***Ray florets*** few, yellow, lamina ovate to oblong, c. 10 × 7 mm, sparsely pilose. ***Disc florets*** many, yellow, c. 5 mm long. ***Anther*** thecae black with pronounced ovate tips. ***Achenes*** grey to black, obconic, 2–4 × 2–2.5 mm, slightly compressed, 3-angled (in ray florets) or 4-angled (in disc florets) with short hairs on truncate apex; pappus of several tiny free scales, plus 1 or 2 often oblique fragile antrorsely barbed terete awns 2–3 mm long.

Distribution. Indonesia (Sumatra, Java, Lesser Sunda Islands, Sulawesi) and Timor Leste. In Singapore it is known from a single collection and is treated as casual.

Ecology. Grasslands and disturbed areas.

Specimens examined. SINGAPORE: **Jurong:** Jurong Lake, at the construction site of a new dam, *Chua & Tan 975*, 27 Jan 1994, SING ([SING0356711, SING0356712, SING0356713, SING0356714, SING0356715]).

Notes. Orchard (2013) placed this species in his new genus *Lipoblepharis* Orchard but here we continue to use the broader concept of *Wollastonia* DC. ex Decne.

Convolvulaceae

7. *Merremia gemella* (Burm.f.) Hallier f., Bot. Jahrb. Syst. 16: 552 (1893); Van Ooststroom, Blumea 3: 297 (1939); Van Ooststroom, Fl. Males., ser. 1, 4: 441 (1953); Na Songkhla & Khunwasi, Thai Forest Bull., Bot. 20: 39 (1993); Fang & Staples, Fl. China 16: 293 (1995); Staples, Gard. Bull. Singapore 61: 493 (2010); Staples, Fl. Thailand 10: 435 (2010); Staples in Kiew et al. (ed.), Fl. Penins. Malaysia, ser. 2, 5: 174 (2015). – *Convolvulus gemellus* Burm.f., Fl. Ind. 46, t. 21, fig. 1 (1768). – TYPE: Java, *Unknown s.n.* (lectotype G-PREL, designated by Van Ooststroom, Blumea 3: 297 (1939)). (Fig. 3)

Herbaceous twiner or creeper. ***Stems*** smooth, appressed yellowish pubescent, later glabrescent, often rooting. ***Leaves:*** petiole 1.5–6 cm, appressed pilose; blade usually ovate (or broadly ovate, oblong, or rarely kidney-shaped), 2.5–6.5 × 1.5–4.3 cm, glabrous or shortly pilose, base broadly cordate or sagittate, margins entire, undulate or coarsely crenate, sometimes 3-lobed, apex attenuate, mucronulate. ***Inflorescences***

Fig. 3. *Merremia gemella* (Burm.f.) Hallier f. **A.** Habit. **B.** Flowers. A from *Lua et al. SING2012-431*, photographed in Buangkok Crescent; B from Bulim. (Photos: H.K. Lua)

cymose, few-flowered; peduncle 2.5–10 cm long; bracts early caducous, minute; pedicels 3–6 mm long. ***Flowers:*** sepals unequal, broadly obovate to subcircular, strongly convex, margins scarious, apex emarginate, slightly mucronulate or not, outer 2 sepals 4–6 mm long, outer surface pilose, inner sepals 6–7 mm long, subglabrous; corolla campanulate to funnelform, 1.5–2 cm long, yellow, midpetaline bands dark, glabrous outside, limb shallowly 5-lobed, lobes emarginate and mucronulate; stamens included, filaments pubescent basally, anthers not spirally twisted; pistil included, white, ovary glabrous. ***Fruit*** a capsule, depressed-globose, c. 7 mm long, coarsely wrinkled; calyx slightly enlarged and reflexed in fruit. ***Seeds*** 4 or less, trigonous, dark grey or brownish puberulent.

Distribution. Throughout tropical Asia and Malesia although evidently a recent introduction to Singapore where it is considered to be casual.

Ecology. Typically a weed in disturbed areas and roadsides.

Specimens examined. SINGAPORE: **Buangkok Crescent:** 3 Oct 2012, *Lua et al. SING2012-431*, (SING [SING0177816]). **Tengah:** Tengah Forest, 13 Mar 2017 *Lua SING2017-091*, (SING [SING0253475]). **Sembawang:** 17 Mar 2020, *Lua et al. SING2020-576*, (SING [SING0341268]).

Cucurbitaceae

8. ***Momordica cochinchinensis*** (Lour.) Spreng., Syst. Veg., ed. 16, 3: 14 (1826); Clarke in Hooker, Fl. Brit. India 2: 618 (1879); Cogniaux in De Candolle, Monogr. Phan. 3: 444 (1881); Ridley, Fl. Malay Penins. 1: 848 (1922); Henderson, Malay. Wild Fls., Dicot. 156, fig. 149 (1959); De Wilde & Duyfjes, Bot. Zhurn. (Moscow & St. Petersburg) 87(3): 137 (2002); De Wilde & Duyfjes, Fl. Thailand 9: 466, fig. 21 (2008); De Wilde & Duyfjes, Fl. Males., ser. 1, 19: 113, fig. 42: e–g (2010); De Wilde & Duyfjes, Fl. Penins. Malaysia, ser. 2, 3: 101 (2012). – *Muricia cochinchinensis* Lour., Fl. Cochinch.: 596 (1790). – TYPE: Vietnam, *Loureiro s.n*. (lectotype BM [BM000944651], designated by Merrill, Trans. Amer. Phil. Soc. 24: 377 (1935)). (Fig. 4)

Dioecious stout perennial climber to 20 m long; all parts (sub)glabrous; older bark pale, warty and fissured; roots tuberous. ***Leaves:*** petiole (3–)5–12 cm long, usually with 1–6 conspicuous glands; lamina entire or 3(–5)-palmately lobed or 3-foliolate (leaflets more or less elliptic, with short petiolule), broadly ovate or subcircular in outline, (3–)7–16(–20) cm wide, base cordate, margin entire or variously dentate, commonly with sessile or stalked glands, apex acute or acute-acuminate, foetid when crushed; venation with areoles 1–2 mm wide, the ultimate veinlets faint. ***Flowers*** somewhat hairy, solitary, or male flower(s) solitary or several in a bracteate raceme to 5(–10) cm long; petals creamy, the three inner ones with a dark blotch at base. ***Male flowers:*** stalk

Fig. 4. *Momordica cochinchinensis* (Lour.) Spreng. **A.** Flowering shoot and a detached flower. **B.** Close up of opened flower. All from *Boo LCMJ 2021-041* collected from Lim Chu Kang. (Photos: W.H. Lim)

with bract subapical; peduncle 5–15 cm long; bract cucullate, suborbicular or reniform, 20–40(–60) mm wide, base rounded or cordate, margin more or less entire, apex sometimes subacute, sometimes with few glands at apex or towards base, sometimes woolly hairy, scabrous or pilose inside; pedicel 3–10(–15) mm long; receptacle tube saucer-shaped, 4(–5) × 10(–15) mm, blackish; sepals coriaceous, (long-)triangular or ovate-oblong, (8–)10–16 × 4–8 mm, acute, blackish, scabrid or glabrous; petals subelliptic or oblong, (25–)40–60(–70) mm long, subacute, conspicuously veined, scales broad, ligulate, 5–7 × c. 5 mm, yellow, directed to the base of the androecium, rendering the perianth somewhat irregular; filaments erect, fleshy, 5–7 mm long, broadly inserted at base of receptacle tube, anthers variable in length, connivent (but free), connective swollen, each locule with a fleshy downwards directed appendage; disc inconspicuous. ***Female flowers:*** stalk 3–10 cm long; bract elliptic, 5 mm long or less, more or less median; ovary ellipsoid-oblong, 12–15 mm long, densely soft-muricate; receptacle tube small, narrow; sepals linear-oblong, 4–10 mm long; petals as in male; style (6–)10 mm long. ***Fruit*** ripening orange-red, irregularly bursting, ovoid, (broadly) ellipsoid or subglobose, (6–)10–15(–20) cm long, (4–)6–10(–15) cm wide, apex more or less pointed, pericarp mostly densely soft-tuberculate or soft-spiny (spines to 10 mm long); fruit stalk 3–12 cm long, with bract (scar) median or above. ***Seeds*** numerous, variable in size and shape, circular, elliptic, or ovate, compressed, 15–30 mm long, 5–8 mm thick, margin coarsely undulate-tubercled; testa brown or grey-black, faces finely sculptured in a patchy pattern.

Distribution. Widespread, from Northeast India and South China, through continental Southeast Asia and Malesia to northern Australia; absent from South India, Sri Lanka, Java (though naturalised in Kebun Raya, Bogor), and the Pacific; rare in Sumatra. Frequently cultivated and escaping over most of its range. In Singapore it has been collected for the first time only recently and is treated as casual but may eventually naturalise.

Ecology. Across its range, in forests and at (degraded) forest edges, at low altitudes.

Specimens examined. SINGAPORE: **Lim Chu Kang:** Lane 9A, near Pei Feng aquatic farm, 20 Oct 2021, *Boo LCMJ 2021-041* (SING [SING0267394, SING0267395]).

Verbenaceae

9. *Verbena brasiliensis* Vell., Fl. Flumin. 17 (1829 [1825]); Vellozo, Fl. Flumin. Icon. 1: t. 40 (1831 [1827]). – *Verbena litoralis* Kunth var. *brasiliensis* (Vell.) Briq. ex Munir, J. Adelaide Bot. Gard. 20: 71 (2002). – TYPE: [Published illustration] Vellozo, Fl. Flum. Icon. 1: t. 40 (1831 [1827]), lectotype designated by Verdcourt in Polhill (ed.), Fl. Trop. E. Africa, Verbenaceae 9 (1992) [the plate was referred to in the protologue even though only published later].

Annual or perennial herb, 1–2 m tall. ***Stem*** 4-sided, sparsely to densely scabrid. ***Leaves*** sessile, oblong-elliptic to lanceolate, acute at apex, ± amplexicaul at base, 5–9.5 × 0.5–2 cm, margin acutely, unevenly serrate-dentate, upper and lower surface scabrid, with tubercule-based hairs. ***Inflorescence*** terminal and axillary, a simple spike, or panicle of spikes, dense, 1–4.5 × 0.4–0.6 cm, bracts lanceolate, 2.25–4.5 mm long. ***Calyx*** 2.5–3.5 mm long, regularly toothed. ***Corolla*** bluish-violet, tube straight, 2.75–3.3 mm long, scarcely exserted, with lobes spreading, ± actinomorphic. ***Stamens*** attached in upper part of tube. ***Ovary*** c. 1.5 mm long, style c. 2 mm long. ***Fruit*** brown, oblong, 1.2–1.5 mm long, reticulate.

Distribution. South America, from Argentina and Chile to Bolivia, Colombia and Peru. Now widely naturalised in the tropics. In Singapore it is treated as historically casual as it is known from one escaped specimen but has not been recorded since 1982.

Ecology. Grasslands, disturbed grounds and roadsides.

Specimens examined. SINGAPORE: **Kranji:** Sungei Kadut Road, 27 May 1982, *Mhd Shah & Ali MS 4197* (SING [SING0057395]).

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