

Annotated List of Seed Plants of Singapore (X)*

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II. Angiospermae-Dicotyledons (cont'd)

131. CONVULVULACEAE

Key to the genera

- A. Parasitic, leafless, twining plants, yellow or pinkish *Cuscuta*
- A. Autotrophic, leafy twining or trailing plants, green
 - B. Style(s) absent; stigma solitary, conical, usually 5-10-rayed; corolla-lobes 2-fid; ovary 1-loculate; berry 1-seeded *Erycibe*
 - B. Style(s) present
 - C. All sepals much enlarged in fruit, deciduous *Porana*
 - C. Sepals enlarged in fruit or not, persistent
 - D. Pollen grains spiny
 - E. Fruit a thin-walled capsule, dehiscent; mostly herbaceous twiners; corolla mostly glabrous outside *Ipomoea*
 - E. Fruit indehiscent or leathery; woody twiners; corolla mostly with hairy bands outside *Argyria*
 - D. Pollen grains not spiny
 - F. Styles 2, free or united near the base
 - G. Styles 2, united below *Bonamia*
 - G. Styles 2, free
 - H. Each style forked with 2 filiform stigmas; small herbs, not twining *Evolvulus*
 - H. Each style with a kidney-shaped lobed stigma, long woody twiners *Neuropeltis*
 - F. Style 1, entire or with 2 minute branches
 - I. Outer sepals acute or acuminate, much longer and broader than the inner ones *Aniseia*
 - I. Outer sepals not both distinctly longer and broader than the inner ones *Merremia*

***Aniseia martinicensis* (Jacq.) Choisy**

Twining herb, the basal parts rooting, to 1.5 m long; leaves narrowly oblong, 3.5-7 cm long; flowers in clusters of 2-3; corolla funnel-shaped, white, 2-3 cm long; capsule ovoid, 4-valved. Collected once at Kampong Ayer, Bajau (*Sinclair 38917*).

* Continued from *Gdms' Bull, Sing.* 38: 174, 1985.

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Argyreia ridleyi Prain ex Coststr. (= *Lettsomia ridleyi* Prain)

Woody twiner, densely hairy; leaves elliptic or ovate, 7-16 cm long; flowers funnel-shaped, 3 cm long, white or purplish, 8-10 together in a head-like cyme. In damp forests, Bukit Mandai, Chua Chu Kang, Nee Soon (*Sinclair SF 40369*).

Bonamia semidigyna (Roxb.) Hall.f.

Twiner, to 15 m long; leaves ovate or heart-shaped, 5-16 cm long; cymes 2-5-flowered; corolla funnel-shaped, 3-4 cm long, white. Collected once at Pulau Merlimau (*Sinclair 5926*).

Cuscuta australis R. Br. (= *C. hygrophilae* Pears.)

Twining parasitic plant; stems slender, filiform, yellow or reddish, with haustoria; leaves reduced to tiny scales; flowers small, in clusters. In waste ground, formerly found in Paya Lebar and Victoria Street (*Ridley 12124*), parasitic on *Hygrophila quadrivalvis* Nees (Acanthaceae); now extinct.

Erycibe festiva Prain

Creéper, to 20 m long; leaves oblong, 7-14 cm long; flowers greenish white, 5-lobed, less than 1 cm across, in axillary clusters. In forest, formerly found in Gardens' Jungle (*Ridley 6043*).

Eryc. griffithii Clarke

Scandent shrub; leaves elliptic to oblong, 7-14 cm long, leathery; flowers white. In hedges and woods, Gardens' Jungle, Bukit Timah Road, Changi (*Goode-nough 3846*).

Eryc. leucoxyloides King ex Prain

Slender climber; leaves lanceolate to ovate, 1.6-5.5 cm long; flowers white, solitary, axillary. In open thickets, Changi, Jurong, Gardens' Jungle, (Bukit Timah, *Ridley 6897*, type).

Eryc. maingayi Clarke

Slender woody climber; leaves oblong or ovate, 6-10 cm long; flowers creamy white. On hedges, and edges of forests, Jurong, Bukit Timah, Tanglin, Mac-Ritchie (*Sinclair SF 40215*).

Eryc. malaccensis Clarke

Creéper or scandent shrub; leaves elliptic to ovate, 5-16 cm long; flowers white, in axillary cymes. In forests, Chua Chu Kang (*Hullett 845*), Changi.

Evolvulus alsinoides L.

Creeping or prostrate small herb, hairy; leaves lanceolate, to 2.5 cm long; flowers 1-3 in leaf-axils, light blue to white; capsule round, splitting into 4 1-seeded parts. On sandy shores at Changi (*Ridley s.n.* in 1890).

Ipomoea alba L. (= *I. bona-nox* L.)

Twining herb; leaves ovate-rounded, entire or 3-lobed, 6-20 cm long; corolla trumpet-shaped, 7-15 cm long, greenish white, fragrant, opening at dusk (thus called 'the moon flower'). Native to tropical America, sometimes cultivated.

Ipom. aquatica Forsk. (= *I. reptans* Poir.)

Herb, trailing on moist soil or on mud in shallow ponds; leaves varying from

linear to ovate, 3-15 cm long, the base cordate or sagittate; flowers funnel-shaped, 2.5-5 cm long, pink or pale lilac. Pantropical, young shoots and leaves used as a vegetable. Geylang (*Teruja* 2945). Vern. Kangkong. 蕹菜.

Ipom. batatas (L.) Lamk.

Herb, prostrate and ascending, with large tuberous roots; leaves broadly ovate to orbicular, 4-14 cm long; flowers bell-shaped, 3-4 cm long, white or pale violet. Native to the New World, the edible tubers can be found in the market. Vern. Keledek. 番薯.

Ipom. cairica (L.) Sweet (= *I. pulchella* auct. non Roth.)

Twining herb; leaves ovate or rounded in outline, 3-10 cm long and wide, palmately divided into 5 lanceolate to ovate segments, the basal segments often lobed again; flowers funnel-shaped, white with purplish red tinge, 4-6 cm long. Native to tropical Africa and Asia, cultivated and naturalized in waste places and thickets.

Ipom. digitata L.

Large perennial twiner; stems terete, glabrous; leaves broadly orbicular in outline, 6-14 cm long, palmately deeply divided into 5-7 pointed lobes; flowers funnel-shaped, 5-6 cm long, pale reddish purple. In waste ground and seashores, sometimes cultivated. Ang Mo Kio (*Ridley s.n.* in 1894), Bukit Timah Road, Changi.

Ipom. gracilis R. Br. (= *I. littoralis* Bl.)

Slender prostrate or twining herb; leaves ovate-cordate, variable in size (1-10 cm long); flowers funnel-shaped, 3-4 cm long, pink or purple, inside darker near the base. On sandy beaches and in thickets. Changi, Sungei Morai, Raffles Light-house (Pulau Satumu) (*Burkill & Kiah, HMB* 467). Vern. Tarpak kuda.

Ipom. horsfalliae Hook.

Woody climber; leaves orbicular in outline, 5-20 cm long and wide, deeply palmately lobed almost to the base into 3-5 segments, the mid-segment usually much larger than the lateral ones; flowers salver-shaped, about 4 cm long, red or reddish purple. Native of the West Indies, sometimes cultivated.

Ipom. illustris (Clarke) Prain

Woody twiner; stems glabrous or pubescent; leaves ovate to orbicular, sometimes ovate-oblong, 6-16 cm long; cymes axillary; corolla tubular, reddish purple with a dark centre, rarely white, 10 cm long. Seashore of Tanjong Gul (*Sinclair s.n.* in 1950).

Ipom. pes-caprae (L.) Sweet ssp. *braziliensis* (L.) Ooststr.

Herb, stems long-trailing and rooting at the nodes; leaves varying, ovate, quadrangular to rounded, the apex rounded, truncate or shallowly 2-lobed; flowers funnel-shaped, 3-5 cm long, reddish purple or rarely white. Common on the sandy coast, Jurong (*Ridley s.n.* in 1894), Changi.

Ipom. quamoclit L. (= *Quamoclit pinnata* Bojer)

Twining annual; stems very slender; leaves oblong in outline, 2-10 cm long, deeply pinnately lobed, the lobes linear, in 8-20 pairs; flowers 1-4, axillary; corolla trumpet-shaped, deeply red (rarely white), 2-3 cm long, 5-lobed near the top. Native to tropical America, sometimes cultivated. 蔦蘿.

***Ipom. triloba* L.**

Twining herb, 1-3 m long; leaves broadly ovate to orbicular in outline, 3-8 cm long, often 3-lobed; corolla funnel-shaped, pink or pale red-purple, 1.8-2 cm long. Native of tropical America, found on reclaimed land and waste places.

***Ipom. tuba* (Schlecht.) G. Don**

Glabrous twiner; stems woody; leaves orbicular or ovate, 5-6 cm long, deeply cordate; flowers axillary, 1 or few together; corolla white, salver-shaped, 9-12 cm long. Pulau Samulun, near seashore (*Sinclair 38844*).

***Merremia hederacea* (Burm. f.) Hallier (= *M. convolvulacea* Dennst.)**

Twining or prostrate herb; stems slender, mostly glabrous; leaves ovate in outline, 2-5 cm long, the base cordate; flowers cymose, bell-shaped, 0.5-1 cm long, yellow. In thickets and open grassland, Jurong, Kranji, Bukit Timah (*Ridley s.n.* in 1894).

***Merr. hirta* (L.) Merr. (= *M. caespitosa* Hallier)**

Twining or prostrate herb; stems slender, mostly hairy; leaves variable in form (linear, oblong to ovate), 3-6 cm long, the base rounded, cordate or hastate; flowers in cymes; corolla funnel-shaped, 1.5-2 cm long, pale yellow or white. In open grassland, Chua Chu Kang (*Ridley 2686*), Kranji, Tanglin.

***Merr. tridentata* (L.) Hallier f.**

Prostrate herb; stems angular, glabrous; leaves varying from linear to oblong, or spatulate, 4-20 cm long, the apex mostly obtuse or emarginate (a variety, var. *hastata* with acute apex), the base often 2-lobed and the lobes toothed; corolla funnel-shaped, 1-1.2 cm long, yellow or white, with a pink eye. On sandy shores, Changi (*Ridley s.n.* in 1891).

***Merr. umbellata* (L.) Hallier f.**

Twining or prostrate herb; stems slender, soft pubescent or glabrous; leaves ovate or oblong, variable, 4-12 cm long, the base rounded, truncate or lobed; flowers in umbellate cymes; corolla funnel-shaped, 2-3 cm long, white or orange-yellow. In thickets or grasslands, Sepoy Lines (*Ridley 11956*).

***Porana volubilis* Berum f.**

Large woody twiner; leaves ovate, 3-9 cm long; flowers in large panicles; corolla bell-shaped, deeply 5-lobed, less than 1 cm long, white fragrant. Native to the neighbouring countries (Burma to Indo-China and Indonesia) but not to Malaya and Singapore, occasionally planted in gardens.

132. HYDROPHYLLACEAE***Hydrolea zeylanica* (L.) Vahl**

Creeping herb with erect branches; leaves lanceolate or oblong, 2-10 cm long; flowers solitary or in panicles; corolla wheel-shaped, 5-7 mm long, blue. According to Ridley, it was formerly found in Geylang, beneath coconut trees in ditches (no specimens available), now extinct.

133. BORAGINACEAE

Key to the genera

- A. Erect shrubs or trees
 - B. Shrubs or small trees
 - C. Shrubs or small trees; flowers in unbranched spike-like inflorescences, or in branched cymes *Cordia*
 - C. Shrubs; flowers solitary or in small cymes, axillary *Carmona* (*Ehretia*)
 - B. Herbs; inflorescences scorpioid, usually not branched *Heliotropium*
- A. Scandent shrubs; inflorescence spike-like, 2-3 times branched *Tournefortia*

Carmona retusa (Vahl) Masam. (= *Ehretia buxifolia* Roxb., *E. microphylla* Lam.)

Erect shrub; leaves spirally arranged, leathery, oblong-ovate, 3-5-tipped, coarsely dentate, 1-6 cm long, dark green and hairy above; flowers axillary, solitary or in small cymes; corolla white, 7.5 mm across; drupe light red, globose. Native to Malaya, sometimes cultivated for training as bonsai or miniature plants and naturalized.

Cordia cylindristachys R. & S.

A bushy shrub, 1-1.5 m tall; leaves elliptic or ovate, 5-10 cm long, rough and toothed; flowers small, crowded in terminal spike-like inflorescence; corolla bell-shaped, 4-6 mm long, white. Native to tropical America, introduced to Singapore as a hedge plant at the end of the last century, became very common in 1940s to 60s; gradually disappearing since the introduction of a beetle (*Schematiza cordiae*).

Cord. dichotoma Forster f. (= *C. obliqua* Willd.)

Tree, 10-15 m tall; Leaves ovate, 5-8 cm long, thin leathery; flowers in branched cymes; corolla white, bell-shaped, 1-1.5 cm long. A native of tropical Asia, formerly planted in kampongs at Ponggol, Changi, Chua Chu Kang (*Ridley* 8059).

Cord. subcordata Lamk.

Tree, 3-10 m tall; leaves elliptic-ovate or heart-shaped, 7-20 cm long; petiole 2-8 cm long; cymes 3- to many-flowered; corolla orange-red, 2-4 cm long. Once collected at Pulau Busing (*Sinclair* 39128).

Heliotropium indicum L.

Erect hairy herb, 10-20 cm tall; leaves ovate-cordate, 3-5 cm long; flowers in terminal scorpioid cymes; corolla bell-shaped, pale violet with a yellow eye, very small (2-4 mm long). A weed in waste ground, Kranji (*Ridley s.n.* in 1894).

Tournefortia tetrandra Bl. (= *T. wallichii* DC.)

Scandent herbaceous shrub; leaves fleshy, ovate, 5-8 cm long; flowers in terminal and axillary branched scorpioid cymes; corolla green, tubular, 1 cm long, 4-toothed. In damp shady places, Water Catchment area, Changi (*Ridley s.n.* in 1890), Jurong.

134. SOLANACEAE

Key to the genera

- A. Cultivated ornamentals or vegetables, usually not producing fruits under local conditions
 - B. Herbs
 - C. Corolla funnel-shaped; stamens 5 *Petunia*
 - C. Corolla tubular, with spreading lobed limb; stamens 4 *Browallia*
 - B. Shrubs
 - D. Thorny, locally not flowering; leafy branchlets sold as a vegetable *Lycium*
 - D. Not thorny; corolla long-tubular, curved near apex *Brunfelsia*
- A. Cultivated or native plants, normally producing fruit
 - E. Fruit capsular
 - F. Flowers solitary, terminal, large (to 25 cm long) capsule spiny *Datura*
 - F. Flowers in panicles or corymbose racemes; fruit unarmed *Nicotiana*
 - E. Fruit baccate
 - G. Anthers forming a cone surrounding the style
 - H. Leaves 2-3 times pinnate; anthers with narrow sterile tip, opening by slits *Lycopersicum*
 - H. Leaves entire, lobed or pinnatifid; anthers without narrow sterile tip, opening at tip by slit or pore *Solanum*
 - G. Anthers free
 - I. Herbs or shrubs; corolla wheel-shaped; stamens exposed *Capsicum*
 - I. Shrubs; corolla salver-shaped, with stamens hidden within *Cestrum*

Browallia speciosa Hook.

Shrubby, usually less than 1 m tall; leaves ovate, alternate or opposite, 4-5 cm long; flowers axillary, white, blue or violet; corolla salver-shaped, about 2.5 cm long. Native to tropical America, sometimes cultivated.

Brunfelsia americana L.

Shrub, 1-2 m tall; leaves oval or ovate, 8-10 cm long; flowers solitary or several together; corolla salver-shaped, about 5 cm long, opening white and changing to yellowish, fragrant at night (thus called 'Lady of the Night'); the calyx less than 1/5 of the corolla tube. Native to tropical America, sometimes cultivated.

Brunf. calycina Benth.

Like the above species, but the calyx about half as long as the corolla which is whitish or violet in colour. Native to the West Indies, sometimes cultivated.

Capsicum annum L.

Shrub or shrubby, up to 1 m tall; leaves ovate, 2-10 cm long; flowers white or tinged purple, axillary, solitary or several together; fruits various, including: (1) the long pepper (var. *acuminatum*) (e.g., the chilli), with red fruits 7-15 or more cm long, often pendulous; (2) the bell or sweet pepper (var. *grossum*) with slightly inflated, globose, ovate or oblong, green or red fruits, 7-10 cm long; (3) the cherry pepper (var. *cerasiforme*), with red, yellow or purplish, cherry-shaped fruits, 1-2.5 cm across. Native to tropical America, widely cultivated. 辣椒.

Cestrum nocturnum L.

Shrub, 3-4 m tall, the branches drooping; leaves ovate-lanceolate, 2-6 cm long; flowers slender, 2-2.5 cm long, clustered at the leaf-axils, more fragrant at night than day (thus called 'Night Jasmine'). Native to the West Indies, sometimes cultivated in gardens.

Datura candida (Pers.) Pasq.

Shrub; leaves short-hairy, ovate or oblong, 20-30 cm long with entire margins; flowers pendent, white, to 25 cm long (thus called 'Angel's Trumpet'), with 5

long-pointed lobes; fruit smooth, ovoid. Native to tropical America; flowers, seeds and leaves poisonous; occasionally planted.

Datura metel L.

Glabrous herb, 1-1.5 m long; leaves smooth, narrowly ovate, 15-20 cm long with wavy margins; flowers erect, pale yellow, white or reddish, single or double, 14-18 cm long; fruit a spiny capsule, globose, 2-2.5 cm across. Native of India, sometimes planted. 曼陀羅.

Lycium chinensis Mill.

Thorny shrub, 1-2 m tall; leaves alternate or sometimes fascicled at the nodes, lanceolate-oblong, 2-7 cm long. Native to E. Asia. Fresh leafy branches are found in local markets and dried red berries can be obtained from Chinese medicine shops. Vern. Chinese box-thorn. 枸杞.

Lycopersicon esculentum Mill.

Weak-stemmed herb, to 1 m tall; leaves 15-35 cm long, divided into 5-9-toothed leaflets; flowers yellow, 3-7 in a cluster; berry ('tomato') varies in shape and dimensions, yellow or red, edible. Native to S. America, often cultivated for the edible fruits. One variety, the cherry tomato, (var. *cerasiforme* Alef), with smaller (1-1.5 cm across) globose, red or yellow fruit, is sometimes grown in pots as an ornamental. The egg-shaped fruit of the 'Tree-tomato' (*Cyphomandra betacea* Sendtn.), another native to S. America, sometimes found in the markets, is also edible and flavoured like the tomato. It can only grow in mountain stations. 番茄.

Nicotiana tabacum L.

Herb, to 2.5 m tall, sticky-hairy; leaves oblong-ovate, acute, hairy on both surfaces; larger blades 30-60 cm long; flowers in paniced racemes; corolla-tube 3.5-6 cm long, widened in upper part, limb 2-3.5 cm across, pale red. The leaves are the source of commercial tobacco. Native to tropical America, the tobacco plant was at one time extensively grown in Mandai, Pulau Tekong and elsewhere. 烟草.

Petunia hybrida Vitmor

Erect or ascending hairy herb; leaves ovate or lanceolate, 1-10 cm long, thick; flowers axillary, solitary; corolla funnel-shaped, 2-5 cm long, varying in colour, sometimes variegated. It is a hybrid between two S. American species, *P. axillaris* B.S. and *P. interifolia* S. & T.

Physalis minima L.

Annual herb, 30-50 cm high, soft hairy; leaves opposite, ovate or heart-shaped, 1-9 cm long; flowers solitary, nodding, bell-shaped, pale yellow with brown spots; berry 1.2 cm across, enclosed in an inflated, reticulate urn-shaped calyx. A weed, found in grassland and waste places, Pulau Ubin (Ridley 367). 小燈籠果.

Solanum ferox L.

Herb, stellate hairy and prickly, to 1 m tall; leaves broadly ovate with a cordate base, 5-30 cm long, shallowly pinnately lobed, prickly on the veins on both sides; corolla white or purple, as long as or shorter than the calyx, divided; berry with stellate hairs. Ridley mentioned that this plant is "said by Malays to have been brought from Java".

Sol. mammosum L.

Shrubby, to 1 m high, pubescent and spiny; leaves ovate, 8-12 cm long, velvety, nerves with spines, flowers in short racemes, densely hairy; corolla blue, 1.2-1.5 cm across; fruit inverted pear-shaped, 6-8 cm high, orange, with about 5 short mamilla-like protrusions from the base. A native to S. America, wild, occasionally planted for its decorative fruits.

Sol. melongena L.

A large stellately hairy herb, sometimes shrubby, to 1 m high, spiny or not; leaves oblong to oval, 10-30 cm long, often lobed; flowers solitary or a few together, opposite the leaves; corolla white or purple, 1-1.5 cm long; berry globose or ovoid, greenish white, purple or black, 10-30 cm long. Native of tropical Asia, cultivated for the edible fruits. Vern. Egg Plant. 茄.

Sol. nigrum L.

Herb, 30-80 cm high; leaves ovate, 1.5-10 cm long, with wavy margins; flowers 2 to many in an extra-axillary cluster; corolla white, 0.5-1 cm across; ripe berry black, about 0.5 cm across. A weed in gardens and waste places, variable; Geylang (*Ridley 8084*). Vern. Ranti.

Sol. torvum Sw.

Shrubby, to 1.5 m high; stems prickled; leaves ovate, 5-10 cm long, lobed, hairy; flowers in cymes; corolla white, 1-1.2 cm across; ripe berry yellow. A weed in waste ground, Tanglin (*Ridley 12383*). 水茄.

Sol. tuberosum L.

The potato is a native of tropical America, now widely cultivated in many parts of the world. The starchy underground tubers are imported for food. 馬鈴薯.

Sol. wrightii Benth.

An ornamental tree, 5-10 m tall; twigs smooth or sparsely prickly; leaves ovate, 9-20 cm long, shallowly or deeply lobed, unequal at base; flowers in cymes; corolla blue or purple, 3-5 cm across; ripe berry globose, 3-5 cm across. Native to Peru, sometimes cultivated.

135. SCROPHULARIACEAE

Key to the genera

- A. Slender herbs, tiny, parasitic on grass-roots *Striga*
- A. Autotrophic herbs, not parasitic
 - B. Corolla not or less clearly 2-lipped
 - C. Flowers axillary, solitary or in pairs; corolla wheel-shaped, 4-lobed *Scoparia*
 - C. Flowers in terminal spikes; corolla cylindrical, 5-lobed *Centranthera*
 - B. Corolla cylindrical or campanulate, distinctly 2-lipped
 - D. Calyx-lobes very unequal
 - E. Stamens 4, 2 or all with one reduced anther-locule *Adenosma*
 - E. Stamens 4, all anther-locules perfect *Bacopa*
 - D. Calyx-lobes \pm equal
 - F. Fertile stamens 2
 - G. Calyx 5-lobed, the lobes narrow *Lindernia* (p.p)
 - G. Calyx 5-toothed *Microcarpaea*

F. Fertile stamens 4

H. Anther-locules separate *Limnophila*

H. Anther-locules contiguous

I. Corolla with a 2-lobed palate in the throat *Mazus*I. Corolla without appendages in the throat *Lindernia* (p.p.)**Adenosma indicum** (Lour.) Merr. (= *A. capitatum* Benth.)

Aromatic herb, 30-60 cm tall; leaves ovate, 3-5 cm long; flowers in dense terminal heads with many leafy bracts at the base; corolla 6-7 mm long, blue, 2-lipped. In sandy fields by roadsides, Tanglin, Chua Chu Kang, Jurong (*Ridley 1826*), Serangoon.

Aden. inopinatum Prain

Erect herb; stems hairy; leaves ovate, 2.5-4 cm long; flowers solitary, axillary; corolla white or purplish. In grassy spots, Tanglin, Bukit Timah (*Nur 25986*).

Aden. javanicum (Bl.) Koord. (= *A. ovatum* Benth.)

Pubescent low creeping herb, 15-50 cm tall; leaves ovate, 1.5-2 cm long; flowers axillary, sessile; corolla pale blue. On roadsides, Tanglin, Chua Chu Kang, Bukit Timah Road (*Ridley 6894*).

Angelonia salicariaefolia Humb. & Bonpl.

Perennial herb, 60-70 cm tall; leaves in a spiral above, opposite and verticillate below, narrow lanceolate, 4-5 cm long; flowers in narrow terminal clusters; corolla short and swollen, 2-lipped, 1-1.2 cm long, blue. A cultivated ornamental from tropical America.

Bacopa monnieri (L.) Pennel (= *Herpestis monnieri* (L.) Rothm.)

Small glabrous herb, 10-15 cm tall; leaves obovate-spathulate, 1-2 cm long; flowers solitary, axillary; corolla 2-lipped, 1 cm long, white. In wet places. Bukit Timah, Tampinis, Rochore, Serangoon (*Ridley s.n.* in 1891).

Centranthera tranquebarica (Spreng.) Merr. (= *C. humifusa* Wall. ex Benth.)

Erect annual herb, 10-15 cm tall, glabrous; leaves linear, 1-1.5 cm long; flowers axillary; corolla tubular, curved, 5-lobed; stamens 4, in 2 pairs. In grassy banks and roadsides, Bukit Timah Road (*Ridley s.n.* in 1898).

Limnophila laxa Benth.

Small annual herb; stamens about 30 cm long, ascending; leaves opposite, linear or elliptic; flowers axillary, solitary or few in a cluster; corolla 2-lipped, less than 1 cm long. In damp places, Seletar (*Hullett 588*, not seen).

Limn. sessiliflora Bl. (= *Ambullia sessiliflora* Baill. ex Wettst.)

Aquatic slender herb; leaves of two forms, the submerged ones 3-6 in a whorl, finely pinnatisect, the aerial ones opposite, narrowly spathulate, toothed, 2-2.5 cm long; flowers solitary, axillary, on aerial branches; corolla pink, 1-1.2 mm long, 2-lipped; stamens 4, in 2 pairs. Introduced water plant; common in aquaria, native to northern Malaya and S. Asia.

Limn. villosa Bl.

Small aromatic herb, pubescent, 10-15 cm long; leaves lanceolate to elliptic, crenate, 1-1.5 cm long, sessile; flowers solitary, axillary; corolla violet, 5 mm long. In ditches and damp spots, Tanglin, Chua Chu Kang, Bukit Timah (*Goode-nough s.n.* in 1891).

Lindernia anagallis (Burm.f.) Penn. (= *Vandellia pedunculata* Benth.)

Annual herb, suberect to prostrate, 30-50 cm tall, rooting at the nodes; leaves shortly petioled or sessile, varying from linear to broadly ovate; flowers solitary, axillary; corolla 2-lipped, 7-10 mm long, white to purple; stamens 4, in 2 pairs; capsule cylindric, to 1.3 cm long. In grasslands; Geylang (*Ridley s.n.* in 1896).

Lind. antipoda (L.) Alston (= *Bonnaya veronicaefolia* Spreng.)

Slender herb, 10-25 cm tall, tufted, sometimes creeping; leaves ovate, 1.5 cm long; flowers axillary, solitary; corolla 2-lipped, 5-10 mm long, violet or white, with yellow spots. In wet places, Ang Mo Kio, Chua Chu Kang (*Ridley 3948*).

Lind. ciliata Penn. (= *Bonnaya brachiata* L. & O.)

Slender erect herb, 5-15 cm tall; leaves ablong, 1-2 cm long, deeply serrate, sessile; flowers in elongate racemes; corolla 2-lipped, white, 1 cm long; stamens in 2 pairs, only the upper pair functional. In damp spots by the stream, Tanjong Katong (*Ridley s.n.* in 1906).

Lind. crustacea (L.) F.v.M. (= *Vandellia crustacea* Benth.)

Small herb, erect or decumbent and rooting at the nodes; leaves lanceolate or ovate, 1-2 cm long; flowers axillary; corolla 2-lipped, violet with dark purple blotches. In waste ground, often a garden weed; Tanglin, Bukit Timah (*Ridley 2700*). Vern. Kerak nasi.

Lind. ruellioides Penn. (= *Bonnaya reptans* Spreng.)

Stoloniferous herb, tufted, 1 cm high; leaves oblong-obovate, 1-1.5 cm long, serrate; flowers in racemes; corolla 1.5 cm long, violet-white. In damp grassy spots by streams; Chua Chu Kang (*Ridley 2940*), Bukit Panjang, Tanglin.

Lind. sessiliflora (Bth.) Wettst. (= *Vandellia sessiliflora* Bth.)

Annual herb, to 10 cm tall; stem creeping and rooting at the nodes; leaves broadly ovate to suborbicular, 1.5-2.5 cm long, sessile; flowers axillary, solitary or in pairs; corolla white; capsule cylindric, 1.2 cm long. A weed sometimes found in gardens and wasteground.

Lind. viscosa (Hornem.) Merr. (= *Vandellia hirsuta* Bth.)

Small herb, 8-10 cm high, hairy; leaves oblong to ovate, 2-5 cm long, crenate; flowers small, in a lax terminal raceme; corolla 2-lipped, 3-4 mm long, pale lilac. In sandy spots, Tanglin, Botanic Gardens (*Purseglove 4029*).

Mazus rugosus Lour.

Small creeping herb; Leaves obovate, 1.5-2 cm long, crenate; flowers in a terminal raceme; corolla 2-lipped, 4-5 mm long, pale violet, white with yellow spots in the centre of the lip. A weed on waste ground, Botanic Gardens (*Ridley s.n.* in 1889).

Microcarpaea minima (Koen.) Meer. (= *M. muscosa* R. Br.)

Very slender herb, 3-10 cm tall, tufted; leaves opposite, oblong, 2-3 mm long; flowers solitary, axillary; corolla cylindric, 5-lobed (1 linear oblong, 4 short, acute, all fringed with white hairs); fertile stamens 4. Edge of damp spots or ponds, 'Reservoir' (*Ridley 12513*).

Russelia equisetiformis Champ. & Schlecht. (= *R. juncea* Zucc.)

Shrubby, 30 cm to 1 m tall; branches 4-angled, green, drooping; leaves often reduced if present, linear-lanceolate or ovate; flowers in a simple terminal panicle, nodding; corolla tubular, 2-2.5 cm long, 5-lobed, bright red, A native of Mexico, planted for its red fire-cracker-like flowers. Vern. Coral Plant.

Scoparia dulcis L.

Herb, 30-60 cm tall; leaves opposite or verticillate, lanceolate, 3-5 cm long, serrate; flowers axillary, solitary or in pairs; corolla pale purple, 4-lobed, with long white hairs in the throat; stamens 4. Native to tropical America, naturalized in wasteland.

Striga asiatica (L.) O. Ktze. (*S. hirsuta* Benth.)

Tiny stiff erect herb, semi-parasitic on grass roots, 8-15 cm high; leaves linear, opposite below and alternate above, 1-1.5 cm long; flowers axillary, solitary; corolla 2-lipped, 1-1.2 cm long, yellow or pink. In grassy places and on roadsides, Kranji, (*Ridley s.n.* in 1894). Vern. Rumpot siku-siku.

Torenia polygonoides Benth.

Small creeping herb, 10-30 cm long; leaves ovate 1-1.2 cm long, serrate; flowers axillary; calyx tubular, 3-winged; corolla 2-lipped, upper lip reddish brown, the lower white. Common in grassland and on banks, Tanglin (*Ridley s.n.* in 1980).

136. LENTIBULARIACEAE

Utricularia bifida Linn.

Terrestrial slender herb; stolons few; leaves linear-spathulate, 1-1.5 cm long, on the stolons; flowering stalk 5-15 cm high; flowers yellow, 6-8 mm long. In damp sandy spots and marshes; MacRitchie Reservoir, Chua Chu Kang (*Ridley s.n.* 1894), Bukit Timah.

Utric. caerulea L. (= *U. albina* Ridl.)

Terrestrial slender herb; flowering stems 8-15 cm tall; leaves rosulate, linear-spathulate, to 7 mm long; flowering stalk to 30 cm long; flowers white or pink, subcapitate; corolla 0.4-1 cm long. In grassy sandy spots, Changi (*Ridley 1474*), MacRitchie Reservoir, Telok Kurau.

Utric. exoleta R. Br.

Floating plant; stolon filiform; leaves slender, capillary, with bladders; traps obliquely ovoid, 1-1.5 mm long; flowering stalks 5-15 cm tall; flowers yellow, 4-8 mm long. In ponds and ditches; Botanic Gardens' lake, Ang Mo Kio (*Ridley s.n.* in 1889).

Utric. punctata Wall. ex A.DC. (= *U. fluitans* Ridl.)

Aquatic; stolons filiform, to 20 cm long; leaves finely dissected, 2-6 cm long; flowering stalks 8-30 cm long; flowers violet or white; corolla 6-10 mm long. In swamps, Changi Road (*Ridley 5642*).

Utric. uliginosa Vahl (= *U. griffithii* Wight)

Terrestrial slender herb; stolons 30-40 cm long; leaves linear or linear-spathulate, 1.5-2(-4) cm long; flowering stalks to 30 cm long; flowers bright purplish blue;

corolla 3-18 mm long. In wet sandy places or in shallow water; Changi (*Ridley s.n.* in 1889), Bedok, Tampines.

137. GESNERIACEAE

Key to the genera

- A. Native plants
 - B. Creeping epiphytes; fertile stamens 4; fruit linear *Aeschynanthus*
 - B. Erect herbs or shrubby; fertile stamens 2
 - C. Fruit ovoid, fleshy, indehiscent *Cyrtandra*
 - C. Fruit linear, dry, dehiscent *Didymocarpus*
- A. Cultivated pot plants
 - D. Fertile stamens 2; corolla-tube short *Saintpaulia*
 - D. Fertile stamens 4
 - E. Herbs with stoloniferous stems; corolla-tube trumpet-shaped *Episcia*
 - E. Herbs with very short stems; corolla bell-shaped *Sinningia*

***Aeschynanthus parviflora* R. Br.**

Creeping epiphyte on trees; leaves leathery, lanceolate-ovate, 4-5 cm long; flowers 5 cm long, curved, deep red. In mangroves; Kranji, Sungei Tengah, Tuas (*Goodenough s.n.* in 1890).

***Aeschy. purpurascens* Hassk.**

Slender epiphyte, on trees or branches; leaves fleshy, lanceolate to ovate, 8-10 cm long; flowers light green, tipped purplish brown, 2-3.5 cm long. In forests, Chua Chu Kang (*Ridley s.n.* in 1892).

***Aeschy. radicans* Jack**

Creeping on rocks and epiphytic on tree trunks; leaves ovate, 1.5-3 cm long, hairy; flowers axillary, solitary or in pairs, bright red. In forests, Bukit Timah (*Md Nur 24637*).

***Aeschy. wallichii* R. Br.**

Shrubby, slender and glabrous; leaves lanceolate or elliptic, 5-7 cm long; flowers axillary, several together, 1.5-2.5 cm long, dark red. In dense forests; Bukit Mandai (*Goodenough s.n.* in 1890), Kranji.

***Cyrtandra pendula* Bl.**

Herb; stems creeping and ascending; leaves alternate, ovate, 10-20 cm long, reddish hairy beneath; cymes axillary; corolla funnel-shaped, creamy white or pale yellow, 3-4 cm long, with purple spots. In forests, Bukit Timah (*Ridley s.n.* in 1890).

***Didymocarpus perdita* Ridl.**

Shrubby, 10 m long; leaves elliptic, peltate, 6-7 cm long, crenulate; peduncles slender, hairy. Endemic to Singapore, only 2 specimens were collected, in ravines, Seletar (*Ridley s.n.* in 1889, type).

***Didym. platypus* Clarke**

Shrubby; stem woody; leaves oblanceolate, 20-30 cm long, sessile, serrate, sparsely hairy; flowers in axillary cymes; flowers white with a yellow mouth, 2-3 cm long. In forests, Bukit Timah (*Hullett 454*), Seletar.

Episcia fulgida (Lind.) Hook. f.

Perennial herb; stems stoloniferous; leaves opposite, elliptic or ovate, greenish with brown lines and blotches, 5-7 cm long; flowers solitary, axillary, corolla salver-shaped, bright red, lobes 5, rounded. Native to Colombia, cultivated commonly as a pot plant. Another species, *E. cupreata* (Hook.) Hanst., a native of Nicaragua, with hairy reddish green leaves and green veins and red flowers, is also planted.

Saintpaulia ionantha Wendl.

Perennial herb, hairy; leaves succulent, oblong or rounded, 3-4 cm long, long-stalked; flowers 1-6 on a long peduncle; corolla short-tubed, 2-lipped, 2-2.5 cm across, violet or in various other colours. Native to tropical Africa ('African Violet'); many forms, some with double flowers. 非洲堇.

Sinningia speciosa (Lodd.) Hiern.

Hairy herb; stems short or creeping underground; leaves oblong or ovate, hairy, 8-15 cm long, long-stalked; flowers bell-shaped, 10-15 cm long, variously coloured (violet, purple, red or white), with 5 round lobes. Native to Brazil, sometimes cultivated as a pot plant, horticulturally known as 'Gloxinia' 大岩桐.

138. BIGNONIACEAE

Key to the genera

- A. Woody climber or twiners
 - B. Leaves simple or 2-foliolate with a long tendril; flowers reddish violet *Saritaea*
 - B. Leaves pinnate, leaflets 3-15; flowers creamy white *Pandorea*
- A. Erect shrubs or trees
 - C. Leaves simple, in whorls or 3-4 each; flowers bright yellow *Deplanchea*
 - C. Leaves compound
 - D. Leaves palmately compound, leaflets 1-5; flowers yellow or pinkish *Tabebuia*
 - D. Leaves pinnately compound
 - E. Leaves once pinnately compound
 - F. Shrubs, rarely small trees
 - G. Native shrubs (or small trees) by tidal rivers; corolla trumpet-shaped, white *Dolichandrone*
 - G. Introduced shrubs, cultivated in gardens
 - H. Corolla bell-shaped, bright yellow *Tecoma*
 - H. Corolla narrow trumpet-shaped, orange red *Tecomaria*
 - F. Tall trees
 - I. Capsules long-linear, twisted or curved; corolla pinkish or dull yellow, fringed *Stereospermum*
 - I. Capsules oblong, not twisted
 - J. Calyx campanulate, 5-lobed; corolla pale yellow *Pajanelia*
 - J. Calyx spathe-like; corolla orange-red *Spathodea*
- E. Leaves 2-3 times pinnate
 - K. Leaflets large (4-12 cm long) and few; corolla trumpet-shaped, pinkish white, capsule linear *Radermachera*
 - K. Leaflets small (0.5-1 cm long) and numerous; corolla bell-shaped, violet, capsule ovate *Jacaranda*

Deplanchea bancana (Scheff.) Steen.

Tree, about 30 m tall; leaves simple, 3-4 in a whorl, obovate to elliptic, 9-30 cm long, glandulate at base; flowers in terminal panicles; corolla tubular, 3-3.5 cm long, bright yellow; stamens 4, in 2 pairs; capsule elliptic, 10-14 cm long. In forest, very rare; Kranji (*Goodenough s.n.* in 1889), Bukit Timah, Seletar.

Dolichandrone spathacea (Linn. f.) K. Schum.

Shrub or tree; leaves pinnate; leaflets 3-11, lanceolate or ovate, 6-20 cm long; flowers 2-10 in terminal raceme, opening in the early morning and closing at noon; corolla white, trumpet-shaped, 16-20 cm long; stamens 4; capsule linear, curved and compressed, 25-60 cm long. Formerly common along tidal rivers, Ponggol, Bajau, Pulau Ubin, P. Tekong, Tanjong Gul (*Burkill HMB 2791*).

Jacaranda filicifolia (Anders.) D. Don

Small tree; leaves opposite, bipinnate; leaflets numerous, elliptic, oblique, 0.5-1 cm long; flowers in terminal panicle; corolla bell-shaped, violet with white-blotched throat; stamens 4, with a long hairy staminode; fruit ovate, 4-7 cm long. A native of S. America, sometimes planted.

Pajanelia longifolia (Willd.) K. Schum. (= *P. multijuga* DC.)

Tree, little branched, 20-25 m tall; leaves pinnate, 40-120 cm long; leaflets 8-12 pairs, obliquely ovate, 10-12 cm long; flowers in terminal thyrses; corolla pale yellowish, dark purple inside, bell-shaped, 5-7.5 cm long, thick and hairy; capsule flat, obovate, 30-45 cm long. Formerly recorded from the coast of Kranji (?*Cantley s.n.* in 1782), now extinct.

Pandorea pandorana (Andr.) Steen.

Climber; leaves opposite, pinnate; leaflets 3-13, varying from linear to orbicular, 2-8 cm long; flowers in cymes; corolla funnel-shaped, white or creamy, 2.5 cm long. Native to E. Malesia, sometimes cultivated.

Radermachera gigantea (Bl.) Miq. (= *R. lobbii* Miq.)

Shrub or tree, leaves mostly twice pinnate, 12-35 cm long; leaflets often elliptic, 4-12 cm long; flowers in terminal panicles; corolla trumpet-shaped, 5-6 cm long, white tinted pink, with yellow streaks in the throat; capsule linear, 15-60 cm long. Tanglin, Bukit Timah, Bukit Mandai and Reservoir Jungle.

Saritaea magnifica (Steen.) Dugand (= *Arrabidaea magnifica* Steenis)

Climbing shrub; leaves opposite; lower leaves simple, obovate, 8-12 cm long; higher ones 2-foliolate with a long terminal tendril; flowers bell-shaped, 6-8 cm long, reddish violet. Native of Colombia, cultivated or escaped.

Spathodea campanulata Beauv.

Tree; leaves opposite or in whorls of three, pinnate; leaflets 7-17, ovate-oblong, 4-12 cm long; flowers in terminal racemes; calyx closed in bud, spathe-like in flowers, containing watery fluid inside, corolla orange-red, obliquely bell-shaped (thus 'African Tulip Tree'), 11-13 cm long, broadly 5-lobed; stamens 4; capsule erect, oblong-lanceolate, 15-20 cm long. Native of tropical Africa, more or less naturalized. 火焰木.

Stereospermum fimbriatum (Wall. ex G. Don) DC.

Deciduous tall tree; leaves pinnate, opposite, 30-75 cm long; leaflets usually 7, rarely 5 or 9, ovate-oblong, 8-16 cm long; flowers in large spreading clusters on the bare twigs; corolla pale pinkish, narrowly funnel-shaped, 6-7 cm long, the lobes finely long-fringed; capsule 4-angled, 35-60 cm long, twisted (thus 'Snake Tree'). Native of Burma and Malaya, sometimes planted by roadsides.

Ster. personatum (Hassk.) Chatterjee (= *Ster. chelonoides* A.P. DC.)

Deciduous tree; leaves pinnate, opposite, 20-50 cm long; leaflets 7-13, elliptic-oblong, 5-15 cm long; flowers in terminal panicles; corolla dull yellow, trumpet-

shaped, 2-3 cm long, with dark red stripes inside; capsule long-linear, to 45 cm long, 4-ribbed, curved. Rare. Tanglin, Bukit Timah (*Ridley 3642*).

Tabebuia chrysantha Nichols

Small spreading tree; leaves opposite, palmate; leaflets 5, elliptic pointed. Central one the largest (6-25 cm long); flowers in cymes, on old branches, yellow, funnel-shaped, 9-12 cm long. Native to Brazil, recently cultivated as a roadside tree; other species including the pinkish flowered *T. pallida* Miers (leaflets obtuse, capsules smaller, less than 15 cm long from the West Indies) and *T. rosea* DC. (leaflets acute, capsules larger, over 22 cm long, from Central America).

Tecoma stans (L.) HBK. (= *Stenolobium stans* Seem.)

Erect shrub, 2-5 m tall; leaves opposite, pinnate; leaflets 7-11, ovate-lanceolate, 4-12 cm long; flowers in terminal racemes; corolla bell-shaped, bright yellow (thus 'Yellow Bell'), 3-4 cm long; capsule linear, 10-18 cm long. Native to South America, planted as ornamental in gardens. 黃鐘花.

Tecomaria capensis (Thunb.) Spach

Straggling shrub; leaves opposite, pinnate, leaflets 5-9, ovate, acute, 1-3.5 cm long; flowers in terminal racemes; corolla orange-red, narrowly funnel-shaped, 3-4 cm long; capsule linear, 6-8 cm long. Native of S. Africa, often planted in gardens.

139. PEDALIACEAE

Sesamum orientale L. (= *S. indicum* L.)

Erect herb, covered with long and short (mucilaginous) hairs; lower leaves opposite, upper ones spirally alternate, oblong-lanceolate, 4-10 cm long; flowers axillary, solitary; corolla white (pale-seeded form) or violet (black-seeded form), obliquely and narrowly bell-shaped, 2.5-3 cm long; capsule erect, 4-angled. Native of Africa; formerly cultivated for its seeds (the 'Sesame seeds'), now an escape occasionally found on wasteland. 胡麻, 脂麻.

140. ACANTHACEAE

I. Synoptic key to the genera

1. Subshrubs, in mangroves or on muddy shores; corolla 2-lipped, with the upper lip obsolete, lower 3-lobed *Acanthus*
1. Not as above
 2. Scandent herbs or shrubs, rarely erect; calyx small, ring-shaped or 10-15-toothed *Thunbergia*
 2. Otherwise
 3. Corolla-lobes in bud twisted to the left
 4. Ovules 3-12 in each locule; capsule usually 6- or more-seeded
 5. Corolla subequally 5-lobed *Hemigraphis, Ruellia*
 5. Corolla distinctly 2-lipped *Hygrophila*
 4. Ovules 2 in each locule; capsule 4- or fewer-seeded *Strobilanthes*
 3. Corolla-lobes in bud imbricate
 6. Ovules 3-10 in each locule; capsule usually 6- or more-seeded *Andrographis*
 6. Ovules 2 or 1 in each locule; capsule 4- or fewer-seeded
 7. Corolla nearly regular subequally 5-lobed *Asystasia, Barleria,*
..... *Crossandra, Eranthemum*
 7. Corolla distinctly 2-lipped *Graptophyllum, Justicia, Peristrophe*

II. Key to some ornamental genera and species*

1. Corolla nearly regular, limb subsequently 5-lobed
 2. Leaves variegated or coloured
 3. Creeping herb; leaves ovate or heart-shaped, purplish, veins sunken; flowers white, in spikes *Hemigraphis alternata*
 3. Shrubs; leaves often mottled with coloured veins
 4. Flowers yellow, 4-5 cm long; bracts red, broad *Sanchezia*
 4. Flowers white with purplish dots smaller bracts green, narrow *Pseuderanthemum*
 2. Leaves generally green above
 5. Bracts of flowers very conspicuous, often colourful,
 6. Bracts red, corolla yellow *Sanchezia*
 6. Bracts whitish with green veins; corolla blue *Eranthemum nervosum*
 5. Bracts of flowers inconspicuous or less so, usually green,
 7. Corolla \pm cylindric
 8. Herbs or small shrubs; flowers variously coloured; stamens 4 *Ruellia*
 8. Shrubs; flowers white, purplish-spotted; fertile stamens 2 *Pseuderanthemum*
 7. Corolla funnel- or bell-shaped.
 9. Bracts edged with long-pointed teeth or thorns; small shrubs; flowers violet-blue, white or yellow *Barleria*
 9. Bracts not as above
 10. Woody or herbaceous climbers, rarely erect shrub; calyx ring-shaped or 10-15-toothed; bracts fairly large; capsule rounded *Thunbergia*
 10. Herbaceous climbers; calyx 5-toothed; bracts small; capsule pointed-topped *Asystasia*
1. Corolla distinctly 2-lipped
 11. Leaves variegated
 12. Creeping herbs; leaves green with red or white veins; flowers yellowish *Fittonia*
 12. Shrubs; leaves green or red-purple, mottled with yellow; flowers red-purple *Graptophyllum*
 11. Leaves generally green
 13. Bracts of flowers very conspicuous, often colourful
 14. Spikes erect
 15. Bracts orange-red; corolla light to purple-red *Aphelandra sinclairiana*
 15. Bracts white with green veins; corolla white and lilac *Justicia betonica*
 14. Spikes curving; bracts brick-red *Beloperone guttata*
 13. Bracts of flowers inconspicuous; flowers in compact clusters *Jacobinia*

Acanthus ebracteatus Vahl

Undershrub, 50-80 cm tall; leaves stiff, oblong, toothed, lobed and spiny, 10-16 cm long; flowers in terminal spikes, 8-10 cm long; bract ovate, 5-6 mm long, without bracteoles; calyx-lobes ovate, free near to base; corolla 2-lipped, upper lip obsolete, lower lip elliptic, 3-lobed, 2-2.5 cm long, white, often with bluish tip and yellow central keel; stamens 4, pinkish. Common in tidal rivers; Jurong, Geylang; used in local medicine. Vern. Jerujuh.

Acan. volubilis Wall.

Shrubby, twining with long internodes, unarmed; leaves lanceolate to elliptic, 7-15 cm long; spikes 6-12 cm long, narrow; bracts ovate, 5-6 cm long; corolla white, 2-2.5 cm long. In tidal mud among grass; Kranji, Tampines.

Andrographis paniculata (Burm. f.) Nees

Herb, 40-90 cm tall, very bitter; flowers in terminal and axillary racemes, paniculate; bracts small; calyx small, 5-lobed; corolla tube straight and narrow, 5-6 mm long, limb 2-lipped, upper lip 7-8 mm long, white with a yellow top, lower lip 6 mm long, broad, 3-lobed, white with violet blotches; stamens 2. Native to India and northern Malaya, cultivated as a medicinal plant, locally naturalized.

* Based on M.C Neal, In *Gardens of Hawaii* pp. 777-779, (1965); rewritten.

Asystasia gangetica (L.) T. Anders. (= *A. coromandeliana* Nees)

Ascending or trailing herb, sometimes climbing, to 1 m long; leaves ovate or heart-shaped, 3-7.5 cm long; flowers 6-10 in spike-like inflorescence, often arranged on one side; bracts small; calyx deeply 5-lobed, 7-9 mm long; corolla 3-3.5 cm long, light violet or white, bell-shaped, narrow at base, widened in the upper half and at the top, segments 5, ovate, subequal; stamens 4. Native to India and Sri Lanka, cultivated and more or less naturalized.

Asyst. nemorum Nees (= *A. intrusa* Bl.)

Ascending or trailing herb; leaves oblong or ovate, 3.5-10 cm long; flowers mostly solitary; calyx (4.5-7 mm long) and corolla (2-3 cm long) smaller than the above species. In hedges and open places, Tanglin, Fort Canning.

Barleria cristata L.

Shrub, 1-1.5 m tall; branches downy; leaves elliptic, pointed at both ends, 4-8 cm long, hairy; flowers sessile, axillary, 1-3 together, each subtended by 2 ovate, spiny-edged green (or white) bracts; calyx 4-lobed; corolla trumpet-shaped, 3-4.5 cm long, 5-lobed, light violet (or white); stamens 4. Native of India, sometimes planted.

Barleria lupulina Lind.

Shrub, like the above species, but with 2 sharp spines in leaf axils; leaves linear-lanceolate, 5-10 cm long; flowers yellow, 4-5 cm long. Native of Mauritius, occasionally planted.

Beloperone guttata Brand. (altern. name: *Calliaspidia guttata* (Brand.) Bremek.)

Small shrub, to 3 m tall; leaves ovate, tip shortly pointed, 2-6 cm long, margin entire; flowers in terminal and axillary spikes, 5-15 cm long, often slightly curved; bracts 4-ranked, ovate-cordate, pubescent, reddish purple, 1.5-2 cm long; calyx small, 5-lobed; corolla 2-lipped, 1.5-2.5 cm long, white, with 2 rows of purplish spots on the 3-lobed lower lip; stamens 2. Native of Mexico, planted in gardens.

Calophanoides quadrifaria Ridl. (= *Justicia quadrifaria* Wall.)

Shrubby, branched, 60-70 cm tall, glabrous; leaves narrowly lanceolate to elliptic, 4-10 cm long; flowers in dense, axillary clusters; bracts small; calyx 5-lobed; corolla small, 5-7 mm long; stamens 2. In sandy spots, Changi (*Ridley s.n.* in 1889).

Crossandra infundibuliformis (L.) Nees (= *C. undulaefolia* Salisb.)

Shrubby to 1 m tall; leaves 4 in a false whorl, oblong-ovate, 3-12 cm long, with wavy margins; flowers in terminal, peduncled, dense spikes (later pushed aside by new branches), 4-angled; bracts ovate oblong, 1.5 cm long; calyx 5-lobed; corolla tube 1.5-2 cm long, limb 5-lobed, 2.5-4 cm wide, bright orange. Stamens 4. Native to India and Sri Lanka, cultivated.

Endopogon ridleyi Clarke

Branched herb, 30 cm tall; leaves opposite, elliptic, unequal-sided, tip acuminate, 8-15 cm long; flowers in pairs or spikes; bracts elliptic, 1.5 cm long, green; corolla 5-7 mm long, white. According to Ridley, it was abundant along the stream at Stagmount (*Ridley 11255*), but entirely destroyed in 1910. Chua Chu Kang, Pulau Damar.

Eranthemum nervosum (Vahl) R. Br. (= *E. pulchellum* Andr.)

Shrub, 1-2 m high, glabrous; leaves broadly ovate, pointed at both ends, 10-15 cm long; side veins oblique and sunken, shallowly toothed; flowers in spikes, 3-8 cm long; bracts elliptic to broadly ovate, 1.5-2.5 cm long, whitish with conspicuous green venation; corolla narrowly tubular, 2-2.5 cm long, limb 5-lobed, lobes subequal; fertile stamens 2. Native to SE. Asia, cultivated.

Fittonia verschaaffeltii Coem.

Creeping herb, rooting at the nodes; leaves subsessile, oval or rounded, base heart-shaped, 5-12.5 cm long, dark green above with a reticulation of red veins; flowers small, 2-lipped, yellow, in a spike of 6-12 cm long. One variety, var. *argyroneura* Nichols (or according to other authors, a separate species), has smaller leaves with a network of white veins. Native of Peru, planted in pots.

Gendarussa vulgaris Nees (= *Justicia gendarussa* Burm. f.)

Erect shrub, branches thickened at the nodes; flowers nearly sessile, in terminal and axillary spikes; 3-12 cm long; bracts narrow; calyx small, 5-8 mm long, narrowly 5-lobed; corolla 2-lipped, 1.5-2 cm long, white, the lips violet-blotched or dotted; stamens 2. Native home unknown, formerly commonly cultivated in kampongs.

Graptophyllum pictum (L.) Griff.

Shrub, 2-3 m high; leaves broadly ovate, pointed at both ends, 10-15 cm long, green or red-purplish with irregular yellowish blotches along the midrib; flowers in cymes forming a terminal panicle, 3-12 cm long; bracts small; calyx 5-lobed; corolla funnel-shaped, 2-3 cm long, 2-lipped, crimson purple; stamens 4, only 2 fertile. Native of eastern Malesia, cultivated.

Hemigraphis alternata (Burm. f.) T. Anders. (= *H. colorata* (Bl.) Hall. (f.))

Creeping herb, purplish, rooting at the nodes; leaves ovate to heart-shaped, 2.5-8 cm long, purplish, veins sunken, blunt-toothed; flowers in narrow spikes, 2-10 cm long, pedunculate; bracts dark purple, 1-1.5 cm long, slightly exceeding the calyx; corolla funnel-shaped, 1.5-2 cm long, white, purple-lined, limb 5-lobed, subequal. Native to eastern Malesia, cultivated for ornament and for medicine.

Hygrophila erecta (Burm. f.) Hochr. (= *H. quadrivalvis* Nees)

Herb, 1-1.2 m tall; stem 4-angled; leaves oblong-obovate, tip round, 3-5 cm long; flowers few, in axillary clusters; calyx shallowly 5-lobed; corolla funnel-shaped, 1-1.2 cm long, 2-lipped, the tube and the upper lip white, lower lip violet edged and purple-dotted; stamens 4. In wet spots; Bukit Timah, Ang Mo Kio.

Hygr. meianthos Clarke

Ascending herb, 30 cm tall; leaves obovate, tip obtuse, 1.5-3 cm long; flowers few, in axillary clusters; calyx white hairy; corolla 1 cm long, white, edged violet. In wet grassland, rare; Botanic Gardens. (Probably merely a variety of the above species).

Hygr. phlomoides Nees

Herb, 1 m tall; branches soft hairy; leaves obovate, tip blunt, 2.5-10 cm long; flowers many, in axillary clusters, bract lanceolate; corolla violet, lower lip darker. In wet places, edge of Garden's lake, Changi (*Ridley s.n.* in 1891), Water Catchment Areas.

***Hygr. spinosa* T. Anders.**

Herb, 0.5-1.5 m tall, with axillary spines (2.5 cm long) leaves linear to lanceolate, 7-14 cm long, sessile; flowers in large clusters; bracts lanceolate; calyx lobed nearly to the base; corolla 2 cm long, pale purple. Native to India, an accidental weed.

***Jacobinia carnea* (Lindl.) Nichols (altern. name, *Cyrtanthera carnea* Bremek.)**

Shrub, 0.5-2 m tall; leaves ovate-oblong, 12-25 cm long; panicles subsessile, erect, 12-20 cm long; bracts narrow, 1-2.5 cm long; calyx deeply 5-lobed; corolla tubular, deeply 2-lipped, 6-7 cm long, pink. Native of Brazil, cultivated.

***Jacob. coccinea* (Aubl.) Hiern. (altern. name, *Pachystachys coccinea* Nees)**

Shrub, 1-2 m tall; leaves oblong or elliptic, 12-27 cm long, glabrous; flowers in dense terminal spikes; bracts ovate, green, hairy, 2-3 cm long; corolla tubulate, laterally compressed, 2-3.5 cm long; 2-lipped, bright red, pubescent. Native to French Guyana, cultivated and escaped.

***Justicia betonica* L. (= *Nicoteba betonica* (L.) Lindau)**

Shrubby, 1-2 m tall; leaves narrowly ovate, pointed, 5-7 cm long; flowers in terminal spikes, 8-10 cm long, often branched; bracts conspicuous, ovate, white with green nerves, 3 bracts subtending one flower; corolla 1-1.5 cm long, white or lilac. Native of Mexico, planted.

***Justicia vasculosa* Wall.**

Straggling herb, 20-30 cm tall; leaves opposite; subequal or very unequal, lanceolate to ovate, 10-12 cm long; flowers in terminal and axillary spikes, 5-10 cm long, bracts not larger than calyx; calyx deeply 5-lobed, lobes lanceolate, hairy; corolla 1.5 cm long, yellow, spotted with pink in the mouth, pubescent. In forests; Bukit Panjang, Bukit Mandai (*Ridley s.n.* in 1889), Chua Chu Kang.

***Peristrophe acuminata* Nees**

Herb, 1 m tall; leaves lanceolate, 6-7 cm long, narrowed at both ends; flowers in terminal and axillary short cymes, briefly peduncled; bracts linear, 1-1.5 cm long; corolla tubular, 1.5 cm long; tube white, limb 2-lipped, purple with a creamy blotch and many purple spots in the mouth. In waste ground and roadsides; Tanglin, Chua Chu Kang, Botanic Gardens (*Purseglove 4041*).

***Peris. roxburghiana* (Schult.) Bremek. (= *P. tinctoria* Nees)**

Herb, 1-1.2 m tall; leaves elliptic-ovate, 5-8 cm long, narrowed at both ends; peduncles 2-3 cm long, pubescent; bracts ovate, 2-4 cm long; corolla 3-4 cm long, tube white, limb bright purple with a curved creamy blotch in the mouth. In shade spots, usually near cultivated land; Changi, Blakang Mati (*Ridley s.n.* in 1892).

***Pseuderanthemum kingii* (Clarke) Ridl.**

Shrubby, slender, 30-40 cm tall; leaves elliptic, 5-7 cm long, acuminate; flowers in pairs on terminal spikes, 6-7 cm long, bracts linear, small; calyx-lobes linear, nearly free to the base; corolla cylindric, 5-lobed, 2-3.5 cm long, white, not 2-lipped. In forests; Changi, Seletar (*Ridley 3776*).

Pseud. reticulatum Radlk.

Shrub, 1 m tall; leaves leathery, ovate or rounded, 3-10 cm long, yellow and pale green with or without yellow bands and blotches; corolla 2-3.5 cm long, the lobes acute, white with purple spots. native of Melanesia, planted as an ornamental.

Ruellia amoena Nees (Altern. name, *Stephanophysum longifolium* Poir.)

Erect herb; leaves opposite, ovate-oblong, 6-15 cm long, acute, shallowly toothed; flowers in axillary long-peduncled (2-10 cm long) cymes; calyx small, 0.7-1 cm long; corolla 3-3.5 cm long, bright red, round-lobed. Native of Brazil, cultivated as an ornamental.

Ruel. repens L. (altern. name, *Dipteracanthus repens* Hassk.)

Herb, erect or ascending, 20-70 cm tall; leaves narrowly lanceolate, 3-10 cm long; flower solitary, axillary, bracteoles leaf-like, ovate, 1-2 cm long; corolla bell-shaped, violet, with 5 rounded lobes. In grassland, Botanic Gardens (*Hullett s.n.* in 1884).

Ruel. tuberosa L.

Spreading or ascending herb, roots tuberous; leaves opposite, oblong or ovate, 6-18 cm long; flowers in axillary cymes, 1-many-flowered; bracts narrow; calyx 2-3 cm long; narrowly 5-lobed; corolla trumpet-shaped, 4-6 cm long; limb violet, sometimes pink or white, 3-5 cm across. Native to W. Indies, planted.

Sanchezia nobilis Hook. f.

Shrub, 1-2 m tall; branches 4-angled, glabrous; leaves oblong, 10-25 cm long (one variety often with a white midrib), petioles winged; flowers in terminal spikes, often branched, bracts ovate, reddish, 3-5 cm long; corolla 4-5 cm long, bright yellow. Native of tropical America, cultivated.

Staurogyne griffithiana O. Ktze.

Creeping or ascending herb, 10-20 cm long; leaves ovate or broadly elliptic, both ends rounded; flowers in terminal, simple or branched racemes, 5-12 cm long; bracts broader than calyx; calyx-lobes linear, one larger than the others; corolla cylindrical, 1-1.5 cm long, white. In forests; Bukit Timah (*Hullett 613*), Kranji, Sungei Buluh.

Staur. setigera O. Ktze.

Ascending herb, 1-25 cm long, pubescent; leaves lanceolate to ovate, 4-6 cm long; flowers in terminal dense racemes, 5-10 cm long; corolla 1.5 cm long, white with pink spots in the mouth. In forests; Bukit Timah (*Ridley s.n.* in 1890), Chua Chu Kang, Jurong.

Strobilanthes dyerianus Mast. (altern. name, *Perilepta dyeriana* Bremek.)

Herb, to 1 m tall; leaves opposite, of the same pair very unequal, larger ones 10-20 cm long, smaller ones much reduced; flowers in terminal and axillary spikes; bracts about the same size as calyx; calyx 2-lipped; corolla bluish violet, 2.5-3 cm long. Native of Burma, formerly planted.

Thunbergia affinis S. Moore

Erect shrub, 1-2 m tall; leaves ovate or rhomboid, 4-11 cm long; flowers axillary, solitary or in pairs; bracteoles persistent; corolla dark violet, tube 4-5 cm long, limb 5-6 cm across. Native to tropical E. Africa, sometimes cultivated.

Thunb. alata Boj. ex Sims

Slender climber; leaves ovate or cordate, 3-5 or more cm long; petioles winged; flowers axillary, solitary; calyx with 11-14 teeth; corolla 3.5-5 cm across, orange-yellow, with (or without) a dark purple mouth, (thus called 'Black-eyed-susan'), rarely white. Native of tropical Africa; in waste places.

Thunb. erecta T. Anders

Erect shrub, 1-2 m tall; leaves ovate-rhomboid, narrowed above, 2-9 cm long; flowers axillary, solitary or in pairs; bracteoles deciduous; corolla dark violet or white, tube 0.5 cm long; limb 3.5-5 cm across. Native of tropical W. Africa; sometimes cultivated.

Thunb. fragrans Roxb.

Slender climber, glabrous; leaves oblong or elliptic, 5-7 cm long; base rounded or hastate; flowers axillary, solitary or in pairs; calyx with 12 teeth; corolla 4-5 cm across, white. Native to India, Java and Australia; an escape from gardens.

Thunb. grandiflora Roxb.

Woody climber, pubescent; leaves cordate, 5-7 nerved at base, 7-18 cm long, shallowly to deeply palmate-lobed; flowers raceme-like, terminal; corolla-tube 3-5 cm long; limb blue-violet or rarely white. Native to SE. Asia; planted as an ornamental, sometimes on overhead bridges, more or less naturalized here.

Thunb. laurifolia Lindl.

Woody climber, glabrous; leaves ovate, lower leaves broad at base and often toothed, upper ones narrower and entire, 3-5 nerved at base, 7-12 cm long; flowers in terminal racemes; calyx a mere rim; corolla-tube 3-4 cm long; limb dark blue. Native to SE. Asia, sometimes cultivated.

141. VERBENACEAE

Key to the genera

1. Inflorescences \pm head-like
 2. Woody
 3. Shrubs, erect or scrambling; inflorescence flat-topped, not surrounded by large bracts *Lantana*
 3. Woody climbers; inflorescence surrounded by large, colourful bracts
 4. Bracts 3-4; corolla 2-lipped *Congea*
 4. Bracts 6; corolla cylindrical, 5-6 lobed *Sphenodesma*
 2. Herbaceous
 5. Erect, garden plants *Verbena*
 5. Prostrate, sea-shore plants *Phyla*
1. Inflorescence not head-like
 6. Inflorescence spike- or raceme-like
 7. Inflorescence spike-like, simple or branched; flowers sessile or nearly so
 8. Trees, on muddy shores or in mangroves, with peg-like breathing roots *Avicennia*
 8. Not as above
 9. Shrubs, cultivated *Citharexylum*
 9. Herbs, escaped weeds *Stachytarpheta*
 7. Inflorescence raceme-like; flowers stalked; creeping or climbing shrubs
 10. Leaves thin and smooth; calyx of 5 green teeth; fruit a yellow berry *Duranta*
 10. Leaves thick and downy, sandpaper-like; calyx of 5 large, star-shaped, colourful lobes; fruit dry, small *Petrea*

6. Inflorescence cymose-paniculate
11. Corolla regular or nearly so, not 2-lipped; stamens exerted
12. Trees; leaves large, 30-60 cm long *Tectona*
12. Shrubs
13. Cymes axillary, shorter than the leaves; calyx tubular, small; flowers 4-merous
..... *Callicarpa*
13. Cymes axillary and terminal, often in terminal panicles; flowers 5-merous
14. Calyx of flower bell-shaped *Clerodendrum*
14. Calyx of flower saucer-shaped *Holmskioldia*
11. Corolla distinctly 2-lipped; stamens included
15. Leaves simple, entire or toothed
16. Flowers large, corolla 2-2.5 cm long *Gmelina*
16. Flowers smaller, corolla less than 0.5 cm long *Premna*
15. Leaves palmately compound, with 3-5 leaflets (or sometimes reduced to one leaflet in *V. trifolia*)
17. Petioles and petiolules strongly swollen towards the apex *Teijsmanniodendron*
17. Not as above *Vitex*

Avicennia alba Bl.

Tree, to 20 m tall; leaves simple, opposite, lanceolate, 8-12 cm long, pointed, lower surface greyish white; flowers small, in branched spikes; corolla tubular, orange, 4-5 mm long, 4-lobed; fruit lanceolate-elliptic, leathery, 1-1.5 cm long, pointed; seedlings semi-viviparous (i.e., fruit dehiscing by 2 valves, the emerging seedling consisting of (1) 2 large, green, subequal cotyledons conduplicately arranged, (2) a fully developed plumule and (3) a stout radicle with tangling hairs). Common in mangrove and along tidal river. Tuas (*Ridley 6312*). Vern. Api api.

Avic. lanata Ridley

Young branches and lower leaf-surfaces densely covered with brown hairs; leaves ovate or elliptic, 8-10 cm long; fruit broadly ovoid, 1.5-1.8 cm long. In mangroves on sandy soils, Pandan Nature Reserve (*Ismail 54*). Vern. Api api.

Avic. officinalis Bl.

Leaves oblong-elliptic, 8-10 cm long, round-tipped; flowers in clusters; fruit ovoid, slightly beaked, 3-3.5 cm long, velvety. Common in mangrove and along tidal rivers. Changi, River Valley Road (*Burkill 3792*), Pulau Ubin. A fourth species, called *A. intermedia* Griff. [? = *A. marina* (Forsk.) Vierch.] is somewhat intermediate between *A. alba* (with the lower leaf surface glaucous) and *A. officinalis* (with round-tipped elliptic leaves) but differing from both in its 4-angled stem. Tuas, Pulau Sudong (*Womersley 61*).

Callicarpa longifolia Lam.

Straggling shrub; 2-3 m tall; leaves lanceolate, 7-15 cm long, stellately hairy beneath; flowers many in cymes; corolla tubular, liliac. Formerly common in hedges in Tanglin, Bukit Timah (*Ridley 2786*) and Changi, now rare.

Citharexylum spinosum L. (= *C. quadrangulare* Jacq.)

A shrub (in country of origin, a small tree); branches 4-angled; leaves opposite or in 3s, oblong or oval, 15-20 cm long, smooth, pointed; flowers in narrow clustered spikes, 10-20 cm long; corolla tubular, white 5-lobed, curved, less than 1 cm long. Native to the West Indies, known as 'Fiddlewood', sometimes cultivated in gardens.

Clerodendrum deflexum Wall.

Small shrub, 1 m tall; leaves opposite, lanceolate or elliptic, 15-30 cm long; flowers in nodding heads, with red bracts; corolla tubular, white, 2-2.5 cm long; drupe purple to black. Common in woods; Gardens' Jungle, Tanglin, Chua Chu Kang (*Goodenough 2796*), Tampinis.

Cler. indicum (L.) Ktze (= *C. siphonanthus* R. Br.)

Shrub; leaves narrowly oblong, 10-12 cm long, in whorls; corolla white, night-blooming, fragrant; fruit purplish with red calyx. Native of SE. Asia, cultivated for its fragrant flowers.

Cler. inerme (L.) Gaertn.

Small shrub, about 1 m tall; leaves elliptic, narrowed at both ends; 4-8 cm long; flowers in axillary small cymes; corolla cylindric, white, 2-2.5 cm long; stamens exsert, dark purple. Common near the sea in tidal mud; Rochore, Changi (*Hullett 625*), Seletar, Pulau Ubin.

Cler. laevifolium Bl. (= *C. disparifolium* Bl.)

Shrub or small slender tree, 5-7 m tall; leaves oblong or lanceolate-elliptic, 5-15 cm long; flowers in slender cymes; corolla pale yellow; fruit black with red calyx. Common in woods; Tanglin, Gardens' Jungle, Bukit Timah, Changi. Vern. Guriam padang.

Cler. nutans Jack (= *C. penduliflorum* Wall.)

Shrub, less than 1 m tall; leaves ovate-lanceolate, pointed, 12-20 cm long; panicles pendent; corolla funnel-shaped, white, 1-1.5 cm long. Native of N. Malaya, occasionally cultivated.

Cler. paniculatum L.

Shrub, 3-4 m tall; leaves heart-shaped, shallowly 3-5 lobed, 15-20 cm long; flowers in large terminal panicles; corolla scarlet, 2-3 cm long. Native of Continental Asia, cultivated for the showy inflorescences.

Cler. philippinum Schauer. (= *C. fragrans* Willd.)

Erect shrub, with root-suckers; leaves broadly ovate, hairy, 8-20 cm long; flowers in dense corymbs; corolla white, 2-3 cm long. Native to Java, cultivated as ornamental. There is a double-flowered variety, var. *pleniflorum* Schauer.

Cler. phylloomega Steud. var. **myrmecophilum** (Ridl.) Moldenke (= *C. myrmecophilum* Ridl.)

Slender shrub, usually unbranched; stem and petioles hollow and tenanted by ants; leaves oblong or lanceolate, 15-30 cm long; panicles large, terminal; corolla cylindric, 1-1.5 cm long, 5-lobed, orange-red; stamens long exsert, dark pink. In muddy wet spots in forests, formerly found at Chua Chu Kang (*Ridley 6700*) and on Pulau Damar.

Cler. thomsonae Balf.f.

Climber; leaves ovate to heart-shaped, 8-12 cm long; calyx white; corolla red (thus 'Bleeding Heart'). Native of W. Africa, often cultivated.

Cler. villosum Bl.

Shrubs, 2-3 m tall, hairy; leaves ovate-cordate, 10-20 cm long; flowers in terminal panicles; corolla white, the tube less than 1 cm long; fruit black, with enlarged white calyx. In waste land, Chua Chu Kang (*Goodenough* 2795).

Congea velutina Wight

A climber, all parts covered with greyish woolly hairs; leaves ovate-elliptic, thick, shortly pointed, 3-15 cm long; panicles much branched, formed by 5-7-small-flowered heads; flowers pink, inconspicuous, the 3-4 bracts subtending the flower-heads spatula-shaped, 2-3.5 cm long, lilac. Native to India and Malaya, cultivated as ornamental.

Duranta repens L.

Creeping shrub with slender, drooping branches; leaves opposite or in whorls, ovate, 3-8 cm long; racemes terminal and axillary, forming panicles; corolla tubular, light blue or white, less than 1 cm long; globose, drupe bright (thus 'Golden Dewdrop'), less than 1 cm across. Native of tropical America, cultivated or escaped. 金露花.

Gmelina asiatica L.

Small bushy tree or climber, with axillary spines; leaves simple, opposite, obovate or rhomboid, 2-4 cm long, often 3-lobed, glaucous beneath; flowers in cymose-racemes on a terminal panicle; corolla obliquely funnel-shaped, yellow, 3-4 cm long; drupe pear-shaped, 2-3 cm across. On waste grounds; Geylang.

Gmel. elliptica. J. E. Sm. (= *G. villosa* Roxb.)

Spiny shrub: leaves ovate, acute, 2.5-7 cm long, densely hairy underneath; corolla yellow; drupe subglobose, 2-2.5 cm across, yellow. Formerly collected at Chua Chu Kang and Geylang. Vern. Bulang.

Gmel. philippinensis Cham. (= *G. hystrix* Schultes)

Scandent shrub, spiny; leaves elliptic, blunt, 8-10 cm long; flowers in pendent clusters, 6-8 cm long, with dark red, ovate bracts; corolla yellow. Tanglin, Gardens' Jungle. Fruit used in local medicine.

Holmskioldia sanguinea Retz.

Shrub, less than 3 m tall; leaves opposite, ovate, pointed, 2.5-8 cm long; flowers in small clusters, both axillary and on branch tips; calyx red or orange, saucer-shaped; corolla funnel-shaped, curved, 5-lobed, 2-2.5 cm long, red (thus 'Cup-and-saucer Plant'). Native of Himalayan region, occasionally planted.

Lantana camara L. (incl. *L. aculeata* L.)

A shrub, branches prickly (var. *aculeata* Mold.) or unarmed; leaves opposite, rarely 3 in a whorl, ovate, 5-12 cm long, pungent-scented; flowers in head-like dense spikes; corolla salver-shaped, curved, 1-1.2 cm long, orange, pink, red, or variegated; drupe bluish. Native to tropical America, originally a garden plant, later growing wild in waste places, several cultivated varieties with an array of flower colours. 馬櫻丹.

Peronema canescens Jack

Small tree, to 14 m tall, with 4-angled branches; leaves opposite, pinnate, 30-90 cm long; leaflets 4-10 pairs, with or without a terminal leaflet, sessile, 10-30 cm

long; terminal panicles 30-60 cm long; corolla small (0.3 cm wide), 2-lipped, greenish white; capsule round, 3 mm broad. In secondary forests, formerly found in Bukit Mandai, now occasionally cultivated.

Petrea volubilis L.

Woody climber; leaves opposite, oval, pointed, 5-15 cm long, thick and downy; racemes hanging from branch tips; calyx 5-lobed, accrescent and persistent, spreading, reaching 3-4 cm across, bluish; corolla funnel-shaped, violet. Native to tropical America often planted in gardens.

Phyla nodiflora (L) Greene (= *Lippia nodiflora* A. Rich.)

Creeping perennial herb, rooting from the nodes, densely covered with greyish soft hairs; leaves opposite, obovate, 2-5 cm long; dense spikes erect, axillary, with prominent bracts; corolla small (2-3 mm long), white and then lilac with a dark eye. In dry sandy waste places.

Premna corymbosa Rottl. & Willd. (= *P. angustior* Ridl., *P. integrifolia* L.)

Low shrub, sometimes creeping; leaves simple, oblong-ovate, 3-10 cm long; panicles corymbose, terminal; corolla small (2-3 mm wide), white, 2-lipped; drupe ovoid, black. On sandy places near the sea. Changi (*Ridley* 2785), Loyang, Chua Chu Kang.

Prem. foetida Reinw. ex Bl.

Large shrub, to 6 m tall, hairy; leaves ovate, acute, 8-15 cm long; corymbs 8-12 cm long and wide; corolla greenish white. In damp low-lying ground, leaves served as a pot herb; Tanglin, Thomson Road (*Hullett* 395).

Prem. parasitica Bl. (= *P. trichostoma* Miq.)

Large climbing shrub, glabrous; leaves oblong-obovate to nearly orbicular, nerves 5-6 pairs; corymbs 10-12 cm across. In woods; Chua Chu Kang (*Ridley* 6828).

Prem. punctulata Clarke

Scandent shrub; leaves elliptic or broadly oblong, rigid, nerves 4-5 pairs, sparsely hairy, 10-15 cm long; corymbs pubescent, branched. Once found in the former Economic Gardens in 1915 (*Ridley*) where it has since disappeared.

Prem. ridleyi K. & G.

Climbing shrub; leaves ovate, or oblong, blunt, subleathery, 4-8 cm long; corymbs 5-12 cm across. Climbing on trees in woods, only one plant was found in the Gardens' Jungle in 1896 (*Ridley* 6826, photo).

Sphenodesma pentandra Jack

Climbing shrub, pubescent; leaves lanceolate or ovate, acute, 5-15 cm long; raceme-like inflorescences consisting of many pairs of heads; heads small, 5-7-flowered, surrounded by 6 large, oblong, 2-3 cm long bracts; corolla bluish. On edge of woods; Seletar, Changi. Vern. Akar sulang.

Stachytarpheta indica (L.) Vahl

Erect herb, to 1 m tall; leaves opposite, bright green, elliptic oblong, 4-11 cm long, margin toothed, the teeth of very different sizes, secondary veins inconspi-

cuous beneath; spikes 15-40 cm long; corolla bright violet, sometimes pale violet or white. Common on seashores.

Stachy. jamaicensis (L.) Vahl

Herb or shrubby, 2 m tall, glabrous; leaves dark green, ovate or oval, 3-8 cm long, toothed, the teeth more or less of same size, secondary veins prominent beneath; terminal spikes 10-20 cm long; corolla tubular, blue, less than 1 cm long. Native to tropical America, a common weed on waste ground.

Stachy. mutabilis (Jack.) Vahl

Differs from *S. jamaicensis* in being hairy throughout, in having a thicker spike, and larger, crimson to pink flowers. Also from tropical America; an ornamental and a garden escape.

Tectona grandis L.f.

Large deciduous tree to 50 m tall; leaves opposite or in threes, oval, 30-60 cm long; panicles large, terminal, 30-90 cm long; flowers small; calyx bell-shaped, much enlarged in fruit; corolla funnel-shaped, white or reddish, 1 cm across; drupe globose, 1-1.5 cm across. Native of monsoon forests of E. India to Thailand and Java, valued for its durable wood (teak), occasionally planted.

Teijsmanniodendron coriaceum (Clarke) Kosterm. (= *Vitex coriacea* Clarke)

Tree; leaves 3-foliolate; leaflets leathery, oblong to elliptic, 7-12 cm long, stalks swollen at the base; flowers in paniculate cymes; corolla violet, 2-lipped; drupe globose to oblong, 1-seeded. In forests; Bukit Timah, Gardens' Jungle.

Teijsm. pteropodum (Miq.) Bakh. (= *Vitex pteropoda* Miq.)

Small tree; leaves palmately compound, petiole 10-15 cm long, broadly winged; leaflets 5-7, elliptic to oblong, 10-50 cm long; panicles terminal; corolla purplish; drupe ovoid. In swampy forests; formerly found at Chua Chu Kang, Pulau Damar.

Verbena hybrida Voss.

Annual herb; leaves oblong, blunt-toothed, 4-8 cm long; flowers in broad heads; corolla red, pink or yellow or variegated, often with a white eye. A hybrid of *V. peruviana* Druce with other S. American species, sometimes cultivated.

Verb. tenuisecta Briq. (= *V. tenera* Spreng.)

Perennial herb; stems creeping; leaves 1.5-2.5 cm long, twice pinnatifid, segments linear; flowers in dense heads; corolla violet, blue or white. An ornamental, native to S. America.

Vitex negundo L.

Shrub; leaves palmate; leaflets 3-5, elliptic, the mid-leaflet distinctly stalked; flowers in terminal panicles; corolla pale to deep blue, with a yellow curved mark on lower lip. A medicinal plant for various ailments; in wasteland, probably introduced. 黃荊.

Vit. pinnata L. (= *V. pubescens* Vahl)

Hairy tree to 10 m tall; leaves palmately compound; leaflets usually 5, almost sessile, the mid-leaflet the largest, about 7.5-20 cm long; panicles terminal;

corolla violet blue; fruit globose, black, flattened. Common in open wasteland and in secondary forests.

Vitex trifolia L.

White hairy shrub; branches drooping; leaves 3-foliolate, rarely simple (var. *repens*); leaflets 3-7.5 cm long, mid-leaflet almost sessile; corolla pale blue; fruit oblong. In gardens and villages near the sea; Pasir Panjang, Pulau Ubin.

Vit. vestita Wall. ex Schau.

Small tree; branches pubescent; leaves 3-foliolate; leaflets elliptic, long-acuminate, 8-18 cm long, mid-leaflet the largest; corolla cylindrical, 1-1.5 cm long, 2-lipped, yellow. In inland forests; Bukit Timah, Jurong.

142. LABIATAE

Key to the genera

1. Flowers mostly in dense axillary (sometimes also terminal) clusters
 2. Leaves finely dissected into lobes and narrow segments *Leonurus*
 2. Leaves entire or toothed, not dissected
 3. Calyx 6-10-toothed
 4. Corolla 2-2.5 cm long, orange or red *Leonotis*
 4. Corolla less than 1.5 cm long, white or bluish *Leucas*
 3. Calyx 4-5-toothed
 5. Flowers in dense ball-like heads or in clusters; corolla 2-lipped, the upper lip bent downwards; weeds *Hyptis*
 5. Flowers in axillary clusters; corolla subequally 4-lobed; cultivated *Mentha*
1. Flowers generally in terminal spike- or raceme-like inflorescences, simple or branched
 6. Spike-like inflorescence densely packed with very tiny (less than 3 mm long), bluish flowers *Pogostemon*
 6. Spike- or raceme-like inflorescence clearly in whorls; flowers larger (over 5 mm long, usually much longer)
 7. Calyx nearly regular, 5-lobed; weeds *Anisomeles*
 7. Calyx irregular, generally 2-lipped; generally cultivated
 8. Stamens 2, anther-cells widely separated on a long slender connective *Salvia*
 8. Stamens 4, anther-cells parallel, not separated,
 9. Stamens coiled in bud, projecting 1.5-2 cm beyond the corolla *Orthosiphon*
 9. Stamens not as above
 10. Lower corolla-lip nearly flat; plants strongly aromatic *Ocimum*
 10. Lower corolla-lip boat-shaped; plant not or only faintly aromatic *Plectranthus* (incl. *Coleus*)

Anisomeles indica (L.) OK. (= *A. ovata* R. Br.)

Herb or shrubby, to 1.5 m high, more or less hairy; leaves ovate, 4.5-6 cm long; flowers in dense false whorls in a spurious spike; corolla tubular, 2-lipped, 7-8 mm long, white or violet. In open and waste places, formerly found at Tanglin (*Ridley 2692*), now probably extinct.

Hyptis brevipes Poit.

Erect herb, to 1 m high; leaves narrowly lanceolate to oblong-ovate, 4-8 cm long; flowers in spurious heads, 1-1.2 cm across in fruit; corolla white, 4-5 mm long, 2-lipped. Native to S. America, more or less established.

Hypt. capitata Jacq.

Annual herb, 1-1.5 m high; leaves lanceolate or rhomboid elliptic, 6-12 cm long; flowers in axillary globular spurious heads, 1.5-2 cm across in fruit; corolla 5-6

mm long, white. Native to S. America, a weed in waste places.

Hypt. suaveolens (L.) Poit.

Branched herb, to 1.5 m high, strongly aromatic; leaves ovate to broadly obovate, 3-5 cm long, pubescent; flowers in 2-5 flowered cymes, on one side of a spurious raceme; corolla blue, tubular, 6-8 mm long. Introduced from S. America, one time very common in waste grounds.

Leonotis nepetaefolia (L.) R. Br.

Erect herb, to 2 m tall; leaves oblong to ovate, 4-12 cm long, toothed; flowers in dense axillary spurious whorls; corolla bright orange or red, 2-2.5 cm long. Native of tropical Africa, occasionally escaped from cultivation, a weed.

Leonurus sibiricus L.

Herb, to 1.5 m tall, leaves linear to ovate, palmate-pinnately dissected, 4-7 cm long, flowers in dense axillary spurious whorls; corolla white, about 1 cm long, 2 lipped. A native of E. Asia; cultivated as an ornamental or for medicinal purposes, occasionally found in wasteland. Vern. Seranting, 益母草.

Leucas lavandulifolia J. E. Sm. (= *L. linifolia* Spreng.)

Annual herb, less than 1 m tall; leaves linear, to lanceolate, 4-6 cm long; flowers in terminal and axillary leafy false whorls, often congested towards apex and forming clusters; calyx oblique, 10-toothed; corolla tubular, 1 cm long, 2-lipped. In open places, rare. Mt Faber (*Ridley* 3888).

Leucas zeylanica (L.) R. Br.

Annual, to 60 cm high, hairy; leaves lanceolate, 4-5.5 cm long; flowers in terminal spurious whorls, usually 6-8 whorls forming a globular head, 1.5-2 cm across; corolla white, tubular, 8-10 mm long, 2-lipped. In open grassland. Pasir Panjang (*Mat. s.n.* in 1894). Vern. Ketumbit.

Mentha arvensis L.

Aromatic perennial, often prostrate, variously pubescent; leaves ovate, 2-4.5 cm long, weakly toothed. A native of the northern hemisphere, a small-leaved form sometimes cultivated in pots, no flowers have been observed. Another related species, *M. spicata* L., an erect or ascending herb of 0.5-1 m tall, with dense axillary clusters of small pinkish flowers, of the northern temperate countries, is occasionally planted. Vern. Pokok kepari, 薄荷.

Ocimum americanum L. (= *O. canum* Sims)

Aromatic herb, erect, 30-50 cm high; leaves lanceolate to elliptic, 2.5-5 cm long; false whorls in spurious racemes, usually branched, 7-15 cm long; pedicels much shorter than calyx, 2 lower calyx-teeth slightly longer than the upper one; corolla white, 4-6 mm long. In settled areas, sometimes cultivated.

Ocim. basilicum L.

Like *O. americanum*, except flowers are larger (corolla 7-12 mm long, white or pinkish). Often cultivated. Vern. Basil, Selaseh.

Ocim. tenuiflorum L.

Like *O. americanum*, except the two lower calyx-teeth equalling the upper tooth and less aromatic. A pantropical weed occasionally found in waste places or in settled areas.

Orthosiphon aristatus (Bl.) Miq. (= *O. stamineus* Benth.)

Slender ascending herb. 30-60 cm high; leaves ovate or rhomboid, 3-9 cm long; terminal spurious racemes 10-15 cm long; corolla pinkish or white, tubular, 10-12 mm long, 2-lipped; stamens coiled in bud, projecting about 2 cm beyond the corolla throat. Native to SE. Asia, sometimes cultivated as an ornamental or medicinal plant. Vern. Kumis kuching 猫鬚草.

Plectranthus scutellarioides (L.) R. Br. (= *Coleus atropurpureus* Benth., *C. blumei* Benth.)

Branched herb, erect or ascending; leaves very variable in size, shape and colouring, generally ovate in outline, 4-7 cm long, toothed; usually in 6-flowered cymes, forming spurious racemes or panicles; corolla boat-shaped, 8-13 mm long, bright purple. Formerly occurred in open places (Jurong, Ridley *s.n.* in 1890), now in cultivation only.

Plectr. rotundifolius (Poir.) Spreng. (= *Coleus tuberosus* Benth., *C. parviflorus* Benth.)

Herb. pubescent; lower stem creeping; older roots often swollen into dark brown tubers, 2-4 cm long; leaves thick, juicy, ovate or suborbicular, 2-5 cm long. Native of India, sometimes cultivated for the edible roots.

Pogostemon auricularius (L.) Hassk. (= *Dysophylla auricularia* (L.) Benth.)

Annual herb, 30-70 cm high, pubescent; leaves narrowly ovate, 4-6 cm long; flowers in dense spurious terminal spikes, hairy; corolla very small, 2-2.5 mm long. Formerly common in open wet spots, Tanglin, Changi (Hullett 375); now probably extinct. Vern. Ekor kuching.

Salvia coccinea Juss. ex Murr.

Slender herb, to 1 m high, hairy or not; leaves ovate or deltoid-ovate, 2.5-3.5 cm long; false racemes terminal, branched or not; flowers 6-10 in a false whorl; corolla bright scarlet, 2-2.5 cm long, the tube straight, 2-lipped. Native of tropical America, sometimes cultivated from imported seeds. 一串紅.