Trees, shrubs, or woody lianas, evergreen or deciduous, rarely subherbaceous. Indumentum of simple hairs, glandular hairs, or multicellular hairs secreting calcium oxalate and forming scales or present beneath cuticle and making leaf blade surface verruculose and sometimes translucent dotted. Leaves opposite, subopposite, whorled, spiraled, or alternate, usually petiolate, estipulate; petiole sometimes persistent and thornlike; leaf blade simple, margin entire or subentire, sometimes toothed, glands often present between crenations of proximal margin and at base or on petiole. Inflorescences terminal, axillary, or extra-axillary, spikes, branched spikes, racemes, panicles, or sometimes capitula, bracteate. Flowers usually regular, rarely slightly zygomorphic, usually bisexual, sometimes bisexual and male flowers present in same inflorescence. Receptacle surrounding and adnate to ovary and extended into a short or long calyx tube dilated distally (together termed “calyx tube” in this treatment); lobes 4 or 5(–8), valvate in bud, persistent or deciduous, sometimes almost absent. Petals 4 or 5, inserted near mouth of calyx tube, imbricate or valvate in bud, conspicuous or not, or absent. Stamens usually 2 × as many as calyx lobes in 2 series, inserted inside distal part of calyx tube, included in or exserted from calyx tube; filaments incurved in bud; anthers dorsifixed, usually versatile, dehiscing longitudinally. Disk usually present, intrastaminal, hairy or glabrous. Ovary inferior, 1-loculed; ovules 2(–6), pendulous, anatropous, usually only 1 developing; style 1, simple, usually free from distal part of calyx tube, subulate to filiform; stigma capitate or inconspicuous. Fruit a pseudocarp, very variable in shape and size, fleshy or dry, 1-seeded, usually indehiscent, often longitudinally 2–5-winged, -ridged, or -angled; endocarp not or at least partly sclerenchymatous. Cotyledons convolute, folded, or twisted. Endosperm absent.

About 20 genera and ca. 500 species: widespread in tropics and subtropics; six genera and 20 species (one endemic) in China.

Tan et al. (J. Plant. Res. 115: 475–481. 2002) inferred a phylogeny of the Chinese genera from nuclear, plastid, and spacer sequences based on 16 species in 19 samples. The mangrove genera *Lumnitzera* and *Laguncularia* Gaertner were placed as sister taxa in a clade sister to the other genera in China plus *Conocarpus* Linnaeus. The latter group comprised two clades: one with *Conocarpus* sister to an unresolved grouping of *Terminalia* and *Anogeissus*; the other with *Getonia* sister to *Quisqualis* and *Combretum*.

In this treatment, measurements of calyx tube length include the stipe (if any), the part surrounding the ovary, the tube above the ovary, and the lobes. Measurements of fruit include any ridges or wings.


1a. Trees or non-climbing shrubs.

2a. Petals present; calyx tube bearing 2 bracteoles; leaf blade cuneate, somewhat fleshy ........................................... 1. *Lumnitzera*

2b. Petals absent; calyx tube without bracteoles; leaf blade oblong, elliptic, obovate, or orbicular, not fleshy.

3a. Inflorescences spikes or racemes, sometimes panicles; middle part of calyx tube not persistent ....................... 2. *Terminalia*

3b. Inflorescences pedunculate capitula; middle part of calyx tube persistent and beaklike at apex of fruit .......... 3. *Anogeissus*

1b. Woody lianas, or if non-climbing shrubs then leaf blade not cuneate and petals present although sometimes inconspicuous.

4a. Calyx lobes persistent, expanded, and winglike in fruit; petals absent ............................................................ 4. *Getonia*

4b. Calyx lobes not persistent; petals present although sometimes inconspicuous.

5a. Calyx tube (1.7–)5–9 cm; stamens not or scarcely exserted from calyx tube; style partly adnate to inside of calyx tube ............................................................ 5. *Quisqualis*

5b. Calyx tube usually shorter than 2 cm; stamens usually exserted from calyx tube; style not adnate to inside of calyx tube ............................................. 6. *Combretum*


Trees small or shrubs, evergreen. Leaves spiraled, densely crowded at apices of branchlets; leaf blade spatulate to narrowly oblongate, gradually narrowed into a short petiole, somewhat fleshy, glossy and glabrous when mature; lateral veins inconspicuous or obscure. Inflorescences axillary or terminal, short, several-flowered spikes or racemes. Calyx tube cylindric or cylindric-ellipsoid, not differentiated into proximal and distal parts, bearing 2 deltoid bracteoles minutely glandular pilose at margin; lobes 5, persistent, deltoid or broadly triangular, margin minutely glandular pilose. Petals 5, red or white, rarely pink [or yellow]. Stamens 5–10. Style persistent. Fruit fusiform or ellipsoid, obtusely angled, dry, ± woody, nearly smooth or longitudinally wrinkled, apex bearing persistent calyx lobes and style.

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2 Missouri Botanical Garden, P.O. Box 299, Saint Louis, Missouri 63166–0299, U.S.A.
The species of this genus are trees of mangrove forests, banks of tidal creeks, and borders of coastal fishponds.

1a. Petals bright red; inflorescences terminal; stamens ca. 2 × as long as petals; fruit fusiform, stipe ca. 5 mm .......................... 1. Littorea

1b. Petals white; inflorescences axillary; stamens shorter than or equaling petals; fruit ellipsoid or ovoid, stipe ca. 1 mm ................................................................................................................................................................................... 2. Racemosa


Red榄李 hong lan li

Pyrrhanthus littorea Jack, Malayan Misc. 2(7): 57. 1822; Bruguiera littorea (Jack) Steudel; Laguncularia cocinea Gaudichaud-Beaupré; L. purpurea Gaudichaud-Beaupré; Lumnitzera cocinea (Gaudichaud-Beaupré) Wight & Arnott, nom. superfl.; L. purpurea (Gaudichaud-Beaupré) C. Presl; Petaloma cocinea (Gaudichaud-Beaupré) Blanco.

Trees to 7–25 m tall; trunk to 0.5 m d.b.h. Bark dark blackish brown, deeply longitudinally fissured. Branchlets reddish or green when young, glabrous. Leaf blade dark green adaxially, oblong-oblong-elliptic, 2–5 × 1–2 cm, apex obtuse or shortly mucronate. Petals bright red, oblong-elliptic, 5–6 mm, apex obtuse. Style ca. 4 mm. Fruit blackish brown, fusiform, 2.5–3 cm × 4–5 mm excluding stipe, longitudinally striate; stipe ca. 5 mm. Fr. Nov–Dec, May, fr. Jun–Aug.

Open remnant mangrove forests along sea shores. S Hainan (Lingshui, Xianian) [Cambodia, Indonesia, China, Thailand, Vietnam; N Australia, Pacific islands].

This species was listed as endangered in China by Ko (in Fu & Jin, China Pl. Red Data Book 1: 224–225. 1992).


栀李 lan li

Adamaram Adanson; Badamia Gaertner; Buceras P. Browne; Buchia Linnaeus, nom. cons.; Myrobalamus Gaertner; Pentaptera Roxburgh.

Trees, often very large and buttressed, rarely shrubs. Branches often in tiers. Leaves spiraled, alternate or opposite, or opposite, often crowded into pseudowhorls at apices of branchlets; leaf blade oblong, elliptic, obovate, or orbicular, hairy or glabrous, often minutely verrucose and translucent dotted (from calcium oxalate crystals), often with domatia, often with 2 or more glands at or above leaf blade base or on petiole. Inflorescences axillary or terminal spikes or racemes, sometimes panicled, with bisexual flowers toward base of inflorescence and male flowers toward apex. Calyx tube proximally broadly cylindrical to ellipsoid or ovoid, distally cupular or sometimes scarcely developed; lobes 4 or 5, deltoid or ovate. Petals absent. Stamens 8 or 10. Fruit variable in size and shape, often fleshy and drupelike, sometimes dry and leathery or corky, often longitudinally 2–5-winged, or -ridged, sometimes weakly so; endocarp usually at least partly sclerenchymatous.

About 150 species: tropics of Africa, America, and Asia, extending to S Africa, Australia, and Pacific islands; six species in China.

The following species have been recorded as cultivated in China. Two species have fruit with 5 broad wings: Terminalia alata Heyne ex Roth

Forest, mixed forests, woods, sparse woods, thickets, mountains, seashores, dry sandy seashores; sea level to 500 m. Hainan [Cambodia, Laos, Malaysia (NW Peninsular Malaysia and Lankawi Islands), ?Myanmar, Thailand, Vietnam].

*Terminalia hainanensis*, described from Hainan, and *T. nigrovenulosa* (S Vietnam), *T. obliqua* (Thailand), *T. triptera* Stapf (Malaysia: Lankawi Islands), and *T. tripteroides* (Thailand) are all clearly the same species. This was already realized by Lecompte (in Aubréville, Fl. Cambodia Laos Vietnam 10: 92. 1969). The name *T. nigrovenulosa* has priority.


Trees evergreen, to 35 m tall; trunk to 2.8 m d.b.h., with large buttresses. Branchlets cylindric, together with petioles glabrous, minutely brownish hirsute when young, or rarely densely brownish long stiff hirsute. Leaves opposite; petiole 0.5–1.5 cm, stout, with 2 stalked glands at apex; leaf blade oblong-elliptic or oblong-lanceolate, 10–25(–30) × 4–10(–15) cm, 2–4 × as long as wide, thickly papery, sparsely brownish hirsute abaxially and on veins adaxially when young, glabrescent or later glabrous, or rarely appressed yellowish brown sericeous when young, later sparsely (except on veins) hairy abaxially and subglabrous adaxially, base obtuse, margin entire or slightly undulate, rarely conspicuously toothed, apex with short, oblique tip; midvein yellow adaxially; lateral veins in 15–35 pairs. Inflorescences terminal or axillary, simple or compound, long, slender spikes, many clustered at branchlet apex and forming a large panicle 18–30(–50) cm; axes densely yellow tomentose. Calyx tube distally cupular, 2.5–3 mm, abaxially tomentose on ovary, gla-

1a. Fruit 2- or 3-winged (or plants cultivated; fruit 5-winged: see *T. alata* and *T. arjuna* above).

2a. Fruit 3-winged, (1.5–)2–3.5 × (1–)1.5–2 cm, glabrous; glands absent at petiole apex or leaf blade base ... 1. *T. nigrovenulosa*

2b. Fruit 2- or 3-winged, 0.3–1 cm, sparsely pubescent to densely villous; 2 glands present at petiole apex or leaf blade base.

3a. Trees evergreen, to 35 m tall, often buttressed, to 2.8 m d.b.h.; leaf blade 10–25(–30) cm, 2–4 × as long as wide; fruit wider than long, 2-winged, sometimes also with 1 rudimentary wing between wings ................................................................. 2. *T. myriocarpa*

3b. Shrubs or trees deciduous, 0.6–10 m tall; leaf blade 1.5–6.5(–11) cm, 1–2 × as long as wide; fruit longer than wide, 3-winged ................................................................. 3. *T. franchetii*

1b. Fruit 2- or 5-ridged, sometimes weakly so, sometimes narrowly 2-winged (and then fruit 3–5.5 cm: *T. catappa*).

4a. Leaves spaced along branchlets, leaf blade elliptic; fruit obtusely 5-ridged, glabrous ........................................... 4. *T. chebula*

4b. Leaves crowded into pseudowhorls at apices of branchlets, leaf blade obolate to oblanceolate; fruit 5-ridged and then velutinous or sericeous, or 2-ridged or -winged and then glabrous.

5a. Fruit subglobose to broadly ellipsoid or ovoid, weakly to strongly 5-ridged, 2–3 cm, densely and finely velutinous or sericeous; leaf blade obolate, base obtuse-rounded or attenuate, lateral veins in 5–8 pairs; petiole 3–9 cm ................................................................................................................................................... 5. *T. bellirica*

5b. Fruit ellipsoid, slightly to strongly compressed, strongly 2-ridged to narrowly 2-winged, 3–5.5 cm, glabrous; leaf blade obolate to oblanceolate, narrowed in proximal half toward a narrow, cordate or truncate base, lateral veins in 10–12 pairs; petiole 0.5–2 cm (or plants cultivated; fruit ca. 1.6 cm: see *T. muelleri* above) ................................................................................................................................................... 6. *T. catappa*
brous on cupular part, adaxially tomentose; lobes 5. Stamens 10, exserted, 2–3 mm. Fruit not stipitate, yellowish when dry, 2-winged, 0.3–0.6 × 0.8–1.2 cm (broader than long); wings opposite, oblong, equal, membranous, sparsely pubescent, glabrescent, sometimes with 1 rudimentary wing seated between them. Fl. Aug–Sep, fr. Oct–Jan.

Forests, streamsides in mountain valleys, one of the upper-layer canopy trees in primary forests; 600–2100(–2500) m. Guangdong (probably planted), SW Guangxi, SE Xizang, C and S Yunnan [Bangladesh, Bhutan, NE India, Indonesia (N Sumatra), Laos, Malaysia, Nepal, Thailand, N Vietnam].

This species was listed as vulnerable in China by Liu (in Fu & Jin, China Fl. Red Data Book 1: 226–227. 1992).

1a. Margin of leaf blade entire or slightly undulate; branchlets and petioles glabrous, or minutely brownish hirsute when young; leaf blade sparsely brownish hirsute abaxially and on veins adaxially when young, glabrescent or later glabrous ............... 2a. var. myriocarpa

1b. Margin of leaf blade conspicuously toothed; branchlets and petioles densely brownish long stiff hirsute; leaf blade appressed yellowish brown sericeous when young, later sparsely (except on veins) hairy

2a. Terminalia myriocarpa var. myriocarpa

千果榄仁 (原变种) qian guo lan ren (yuan bian zhong)

Myrobalanus myriocarpa (Van Heurck & Müller Argoviensis) Kuntze.

Branchlets and petioles glabrous, or minutely brownish hirsute when young. Leaf blade sparsely brownish hirsute abaxially and on veins adaxially when young, glabrescent or later glabrous, margin entire or slightly undulate.

Forests, one of the upper-layer canopy trees in primary forests; 600–1500(–2500) m. Guangdong (Zhongshan, probably planted), SW Guangxi (Longzhou), Guangxi (Longzhou), SE Xizang (Mêdog), C and S Yunnan [Bangladesh, Bhutan, NE India, Indonesia (N Sumatra), Laos, Malaysia, N Myanmar, Nepal, Thailand, N Vietnam].

The name "Terminalia saja" (Steudel, Nomencl. Bot., ed. 2, 2: 669. 1841) is a nomen nudum. Steudel cited the synonym "Pentaptera saja" (Wallich, Numer. List no. 3983. 1831), but that name also is a nomen nudum.

2b. Terminalia myriocarpa var. hisruta Craib, Fl. Siam. 1: 606. 1931.

硬毛千果榄仁 ying mao qian guo lan ren

Branchlets and petioles densely brownish long stiff hirsute. Leaf blade appressed yellowish brown sericeous when young, later sparsely (except on veins) hairy abaxially and subglabrous adaxially, margin conspicuously toothed. Fr. Oct.

Forests, streamside in mountain valleys; 1000–2100 m. W Yunnan (Lushui) [N Thailand].

This variety is maintained here as separate from typical Terminalia myriocarpa not merely as a hairy variant, but also because of the conspicuously toothed leaf blade margin.


滇榄仁 dian lan ren

Shrubs or trees deciduous, 0.6–10 m tall. Bark longitudinally striate when old. Branches slender, golden velvety, or with pilose hairs gradually deciduous when old. Leaves alternate; petiole 0.4–1.5 cm, densely or sparsely brownish yellow tomentose or glabrous, with 2 glands at apex; leaf blade oblong to elliptic, ovate or broadly so, or obovate, 1.5–6.5(–11) × 1.2–4.5(–6.5) cm, 1–2 × as long as wide, papery, abaxially densely yellow or brown appressed sericeous, glabrescent, glabrous except hairy on veins and margin, or if sparsely hairy then not appressed sericeous, adaxially tomentose to ± glabrous, or both surfaces glabrous, base cordate, truncate, rounded, obtuse, or cuneate, apex retuse, rounded, or obtuse, mucronate; lateral veins in 5–15 pairs. Inflorescences axillary or terminal, simple spikes, 2.5–10(–12) cm; axis hairy. Calyx tube distally cupular or salverform, 4–5 mm, abaxially villose, or densely yellowish long hairy on ovary and with fewer hairs on cupular part, adaxially hairy or yellow pappose; lobes 5. Stamens 10, exserted, 4–5 mm. Fruit usually not stipitate, obovoid or broadly cylindric, deltoid in transverse section, 3-winged, 0.5–1 × 0.3–0.7 cm, yellowish brown (rarely white) tomentose or villose, usually densely so, or shortly and rather sparsely whitish pubescent, base obtuse, apex acute or acuminate; stipe rarely present (? in Thailand only) and then to 6 mm. Fl. Apr–Jul, fr. May–Dec.

Mixed forests, scattered forests, dry scrub forests, thickets, open thickets, thicket margins, scrub, open stony hills, slopes, dry river valleys, stony river deposits, cliff ledges, open dry places; (1000–)1100–3700 m. NW Guangxi, WE Sichuan, SE Xizang, Yunnan [N Thailand].

3a. Terminalia franchetii var. franchetii

滇榄仁 (原变种) dian lan ren (yuan bian zhong)

*Terminalia triptera* Franchet, J. Bot. (Morot) 10: 291. 1896, not Stapf (1895); *T. dukouensis* W. P. Fang & P. C. Kao; *T. franchetii* var. *gabra* Exell; *T. franchetii* var. membranifolia A. C. Chao; *T. franchetii* var. *tomentosa* Nanakorn; *T. micans* Handel-Mazzetti, nom. illeg. superfl.

Trees or shrubs 1.5–10 m tall. Leaf blade 5–6.5(–11) × 2.5–4.5(–6.5) cm, abaxially densely yellow or brown appressed sericeous, glabrescent, glabrous except hairy on veins and margin, or if sparsely hairy then not appressed sericeous, adaxially tomentose to ± glabrous. Spikes 4–10(–12) cm. Fl. Apr–Jul, fr. May–Dec.

Mixed forests, scattered forests, thickets, thicket margins, dry scrub, open scrub, open stony hills, slopes, dry river valleys, open dry places; (1000–)1100–3700 m. NW Guangxi (Longlin), SW Sichuan, Yunnan [N Thailand].
As circumscribed here, *Terminalia franchetii* var. *franchetii* displays considerable variation in the size of the leaf blades and the density and distribution of their indumentum. For example, plants from S Yunnan with larger, less hairy leaf blades have been called *T. franchetii* var. *membranifolia*, and plants from the Jinsha Jiang in SW Sichuan and NW Yunnan with glabrous to sparsely hairy leaf blades have been called *T. franchetii* var. *glabra*. Plants from Dukou in S Sichuan with hairy leaves at the large end of the size range were named *T. dukouensis*, and plants from N Thailand with hairy leaf blades and shortly stalked flowers and fruit were named *T. franchetii* var. *tomentosa*. However, apart from the minor detail of stalked flowers and fruit in the entity from Thailand, there seem to be no clear-cut discontinuities between typical *T. franchetii* and these variants, so they are not recognized as distinct taxa here. On the other hand, plants named *T. intricata* from the dry valley region where Sichuan, Xizang, and Yunnan meet appear to represent a distinct, xerophytic, local variant of *T. franchetii* and are accordingly recognized here at varietal rank.


Shrubs 0.6–5 m tall. Leaf blade 1.5–4 × 1.2–2.5 cm, both surfaces glabrous. Spikes 2.5–5 cm. Fl. May–Jun, fr. Jun–Nov.

- Dry scrub forests, thickets, open thickets, scrub on open rocky slopes, stony river deposits, cliff ledges, open dry places; 1900–3400 m. SW Sichuan (Dèrong, Xiangcheng), SE Xizang (Markam), NW Yunnan.


Branchlets and both surfaces of leaf blade glabrous, or tawny tomentose only when young.  

- Sparse forests, thickets, also cultivated on village commons; 800–1800 m. Native in W Yunnan; cultivated in Fujian, Guangdong, Guangxi (Nanning), and Taiwan (Nantou) [Bangladesh, Bhutan, Cambodia, India, Laos, Malaysia (introduced), Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

5. *Terminalia bellirica* (Gaertner) Roxburgh, Pl. Coromandel 2: 54. 1805 ["*bellirica*"].

### 5. *Terminalia bellirica* (Gaertner) Roxburgh, Pl. Coromandel 2: 54. 1805 ["*bellirica*"].


Tress deciduous, to 35 m tall; trunk to 1 m d.b.h., with large buttresses. Bark gray, longitudinally ridged. Branchlets with conspicuously, spirally ascending leaf scars. Leaves spiraled, crowded into pseudowhorls at apices of branchlets; petiole 3–9 cm, glabrous but ferruginous tomentose when young, especially at base, with 2 glands above middle; leaf blade glossy, ovate, 18–26 × 6–12 cm, both surfaces glabrous except ferruginous tomentose when young, base obtuse-rounded or attenuate, apex obtuse or mucronate; leaf blade in 5–8 pairs. Inflorescences axillary, simple spikes, 5–18 cm, often grouped at
branchlet apex and forming a panicle; axis densely ferruginous tomentose. Calyx tube distally shallowly cupular, 4–5 mm, abaxially tomentose, adaxially long villous; lobes 5. Stamens 10, exserted, 4–5 mm. Fruit shortly stipitate, subglobose to broadly ellipsoid or ovoid, weakly to strongly 5-ridged, 2–3 × 1.8–2.5 cm, densely and finely velutinous or sericeous; stipe ca. 2 mm. Fl. Mar–Apr, fr. May–Jul. 2n = 48.

Scattered forests, sunny mountain slopes, one of the upper layer trees of stream valleys and lower seasonal rain forests; 500–1400 m. S Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam; N Australia; introduced in E Africa].


Trees to 20 m tall; trunk to 2 m d.b.h. Bark brownish black, longitudinally peeling. Branches spreading, forming tiers. Branchlets densely brownish yellow tomentose near apex, densely covered with conspicuous leaf scars. Leaves alternate, crowded into pseudowhorls at apices of branchlets; petiole 0.5–2 cm, stout, tomentose; leaf blade obovate to oblanceolate, narrowed in proximal half, 12–30 × 8–15 cm, both surfaces glabrous or abaxially sparingly softly hairy when young, base narrow, cordate or truncate, apex obtuse or mucronate; lateral veins in 10–12 pairs. Inflorescences axillary, simple, long, slender spikes, 15–20 cm, numerous flowered; axis shortly white tomentose. Flowers fragrant. Calyx tube distally cupular, 7–8 mm, abaxially white tomentose, densely so on ovary, sparingly so on cupular part, adaxially glabrous; lobes 5. Stamens 10, exserted, 2–3 mm. Fruit not stipitate, red or blackish green when ripe, ellipsoid, slightly to strongly compressed, strongly 2-ridged to narrowly 2-winged (wings to 3 mm wide), 3.5–5.5 × 2–3.5 cm, glabrous; pericarp woody, rigid. Fl. Mar–Jun, Oct, fr. May, Jul–Sep.

Sandy seashores, beaches with humid climate, villages, grassy village commons, also cultivated as a roadside tree. Guangdong, Hainan, Taiwan (including Lan Yu), SE Yunnan [Bangladesh, Cambodia, India (including Andaman and Nicobar Islands), Indonesia, Malaysia, Myanmar, New Guinea, Philippines, Thailand, Vietnam; N Australia, Indian Ocean islands, Madagascar, Pacific islands; planted throughout the tropics as a shade tree].

The fruit is edible.


(Property information provided by an expert in botany.)

Getonia floribunda

_Calycopteris_ Poiret, nom. illeg. superfl.

Lianas woody. Leaves opposite or subopposite; leaf blade elliptic or lanceolate to ovate. Inflorescences axillary, simple or branched spikes crowded toward branchlet apex and forming a large, often dense, bracteate panicle. Calyx tube proximally ellipsoid, 5-ridged, distally campanulate; lobes 5, triangular-lanceolate at anthesis, persistent and much enlarged in fruit. Petals absent. Stamens 10. Fruit narrowly ovoid, dry, longitudinally 5-ridged; persistent calyx lobes spreading, winglike, elliptic to oblanceolate or narrowly so.

One species: Bangladesh, Cambodia, China, India, Laos, Malaysia, Myanmar, Singapore, Thailand, Vietnam.

The correct name for this genus is _Getonia_, not _Calycopteris_ as given in FRPS (53(1): 3. 1984). Lamarck (Tabl. Encycl. 1: t. 357. 1793) published a plate captioned “_Calycopteris_” comprising an illustration with analysis. Under Art. 42.1 of the Vienna Code a name of a genus and its single species may be simultaneously validly published with a descriptio generico-specifica, in place of which, before 1908, an illustration with analysis is acceptable (Art. 42.3 and 42.4). However, Art. 42 does not apply to the publication of a genus name alone, so Lamarck did not validly publish any names. The text corresponding to the plate was published later (Poiret, Tabl. Encycl. 2: 485. 1819), but, before that, Poiret (Encycl., Suppl. 2: 41. 1811) published a description of the genus and recombined _Getonia floribunda_ Roxburgh (1798) as its only species, _C. floribunda_. In citing _G. floribunda_, Poiret included the type of the then unispecific _Getonia_, so that _Calycopteris_ was nomenclaturally superfluous when published and is therefore illegitimate (Art. 52.1).


Getonia floribunda

_Calycopteris floribunda_ (Roxburgh) Lamarck ex Poiret; _C. nutans_ (Roxburgh) Kurz; _C. nutans_ var. _glabriscula_ Kurz; _C. nutans_ var. _roxburghii_ Kurz; _Combetrum sericeum_ (Walpers) Wallich ex C. B. Clarke (1878), not G. Don (1824); _Getonia nitida_ Roth; _G. nutans_ Roxburgh; _Poivrea sericea_ Walpers.

Lianas to 10 m or more tall. Branchlets densely pilose. Petiole 8–12 mm, densely pilose; leaf blade green adaxially, 5–15 × 3–7 cm, leathery, abaxially densely dark scaly and pilose, adaxially glabrescent but persistently pilose on midvein and lateral veins; lateral veins in 5–8(–10) pairs. Panicles to 30 cm or more; peduncle and rachis densely pilose; bracts 2–3 mm, densely pilose. Calyx tube 7–10 mm at anthesis, abaxially densely pilose; lobes 2–3.5 mm at anthesis, both surfaces densely pilose. Filaments 2–3 mm. Fruit 18–23 mm including calyx lobes, densely pilose; persistent calyx lobes 10–14 mm, longitudinally 3-veined with reticulate veins between, both surfaces pilose, especially on veins, or glabrescent, abaxially sparsely dark scaly. Fl. Mar–Apr, fr. May–Jun. _n_ = 26.

Monsoon forests, forest margins; 300–600 m. W Yunnan (Yingjiang) [Bangladesh, Cambodia, India, Laos, Malaysia, Myanmar, Singapore, Thailand, Vietnam].

This species was listed as endangered in China by Xu (in Fu & Jin, China Pl. Red Data Book 1: 222–223. 1992).


Quisqualis indica

Kleinaia Crantz (1766), not Miller (1754); Mekistus Loureiro ex B. A. Gomes; Sphalanthus Jack.

Lianas woody. Leaves opposite or subopposite; petiole persistent and thornlike; leaf blade ± elliptic, glabrous or hairy. Inflorescences terminal or axillary, simple or sometimes compound spikes. Calyx tube (1.7–)5–9 cm, ± uniformly narrowly tubular except funnelform at apex, deciduous above ovary, hairy or subglabrous; lobes 5, deltoid or triangular-lanceolate, small, apex sometimes cuspitate. Petals 5, white or red, larger (often much more so) than calyx lobes. Stamens 10, not or scarcely exerted from calyx tube. Style partly adnate to inside of calyx tube (in Chinese species). Fruit fusiform to subglobose or ovoid, longitudinally 5-ridged or -winged, dry, leathery.

About 17 species: tropical Africa, tropical Asia; two species in China.

Jongkind (Bull. Mus. Natl. Hist. Nat., B, Adansonia 12: 275–280. 1991) proposed uniting _Quisqualis_ with _Combetrum_ on the grounds that the two genera cannot be separated morphologically in a consistent manner. Tan et al. (loc. cit., see note under family heading) found _Quisqualis_ and _Combetrum_ to be monophyletic sister taxa, but noted that their sampling (two species of each genus in five samples) was insufficient to examine problems of generic circumscription.

1a. Calyx tube 5–9 cm; petals 10–24 mm, opening white, later turning yellowish abaxially and reddish adaxially; inflorescence lax; petiole without an inflated joint near base ................................. 1. _Q. indica_.

1b. Calyx tube 1.7–2.4 cm; petals ca. 3.5 mm, opening dark red or reddish; inflorescence dense; petiole with an inflated joint near base ................................................................. 2. _Q. conferta_.
Lianas to 8 m tall. Branchlets brownish yellow pubescent. Petiole 5–9 mm, without an inflated joint near base, densely brown pilose when young; leaf blade mostly oblong-elliptic or elliptic, 5–18 × 2.5–7 cm, abaxially sometimes brown pilose, adaxially glabrous except slightly brown pilose on midvein, finely white verruculose; rarely tomentose on both surfaces, base obtuse, apex acuminate to shortly caudate; lateral veins in 7 or 8 pairs. Inflorescences lax; bracts deciduous, filiform-linear to ovate, 3–12 mm, brown pilose. Flowers fragrant. Calyx tube 5–9 cm, yellow pilose; lobes deltoid, 2–3 mm, apex acute or shortly acuminate but not cuspidate. Petals opening white, later turning yellowish abaxially and reddish adaxially, obovate to oblanceolate, 10–24 × 4–10 mm, apex rounded to obtuse. Fruit red when young, greenish black or brown when ripe, fusiform or narrowly ovoid, sharply 5-ridged, 2.7–4 × 1.2–2.3 cm, glabrous, apex mucronate. Fl. Mar–Nov, fr. Jun–Nov.

Rain forests, low woods, thickets, hedges, mountains, dry hillsides, riversides, roadsides, wasteland, also cultivated; below 1500 m. Fujian, plants correspond with and size of its bracts. Most Chinese specimens with bracts still attached used medicinally to kill intestinal parasites.

This species is cultivated in China as an ornamental. The seeds are used medicinally to kill intestinal parasites.

*Quisqualis indica* is variable in its indumentum and in the shape and size of its bracts. Most Chinese specimens with bracts still attached have linear-abaxially to filiform-linear bracts. In this respect, these plants correspond with *Q. indica* var. *villosa*, as defined by Lecompte (in Aubrèville, Fl. Cambodge Laos Vietnam 10: 22–31. 1969), who described var. *indica* as having ovate to lanceolate bracts in FRPS (53:1): 17. 1984), var. *villosa* was said to have ovate leaf blades, tomentose on both surfaces (vs. elliptic or ovate, abaxially sometimes brown pilose, and adaxially glabrous in *var. indica*).

Four specimens from Guangdong (Deqing, Guangzhou, Nanhai, and Xingning), at least three of which are from cultivated plants, have a shorter calyx tube, 3–5 cm, and smaller petals, 8–9 × 3–4.5 mm, than is normal for *Quisqualis indica*. It is possible that these belong to *Q. indica* var. *pierrei* (Gagnepain) O. Lecompte (*Q. pierrei* Gagnepain), described from S Vietnam, which differs from *var. indica* in having smaller flowers of about these dimensions and, strikingly, in having fruit with 5 broad, papery wings 1–1.5 cm wide. However, because the specimens lack fruit, this determination is only tentative.


Branchlets brown pilose. Petiole 3–7 mm, with an inflated joint near base, brown pilose; leaf blade oblong, 5–13 × 2–5.5 cm, abaxially glabrous except sparsely pilose on midvein and with denser hairs in axils of lateral veins, adaxially glabrous and finely white verruculose, base rounded, apex acuminate. Inflorescences dense; bracts leaflike, lanceolate, 5–12 × 2–4 mm, brown pilose, becoming sparsely so. Calyx tube 1.7–2.4 cm, brown pilose; lobes triangular-lanceolate, ca. 2 mm, apex cuspidate, cusp filiform, 1–3 mm, often recurved. Petals opening dark red or reddish, oblong-elliptic, ca. 3.5 × 2 mm. Fruit glossy black when ripe, ovoid, conspicuously 5-ridged, ca. 2.5 cm, glabrous. Fl. Jan.

Dense forests, wetlands; 400–1100 m. Yunnan [Cambodia, Indonesia (Sumatra), Malaysia, Thailand, S Vietnam].

Records of *Quisqualis candata* Craib from Yunnan (e.g., in FRPS 53(1): 17. 1984) are based on misidentifications of *Q. conferta*. *Quisqualis candata* is endemic to Thailand and differs in having calyx lobes with an apical cusp not more than 1 mm and not recurved.

6. **COMBRETUM** Loefling, Iter Hispan. 308. 1758. nom. cons.

**凤车子属** *feng che zi shu*

*Cacoucia* Aublet; *Embryogonia* Blume; *Grislea* Linnaeus; *Poivrea* Commerson ex Candolle.

Lianas woody, or shrubs when lacking climbing support, rarely non-climbing shrubs, trees, or subherbaceous. Leaves opposite, whorled, or rarely alternate; petiole sometimes persistent and thornlike; leaf blade variable in shape, generally elliptic or oblong-elliptic to broadly ovate, hairy or glabrous, often conspicuously scaly, often with domatia. Inflorescences terminal, axillary, or extra-axillary, simple or branched spikes, racemes, or panicles. Calyx tube usually shorter than 2 cm, proximally ellipsoid or fusiform, slightly contracted above ovary, distally narrowly funnelform to saucer-shaped; lobes 4 or 5, rarely more, deltoid to subulate, sometimes almost absent. Petals 4 or 5, white, yellow, orange, red, or purple, small and inconspicuous or showy and exceeding calyx lobes. Stamens usually 8 or 10, usually exserted from calyx tube. Style not adnate to inside of calyx tube (in Chinese species). Fruit often shortly stiptitate, dry, rarely fleshy, longitudinally 4- or 5-winged, ridged, or -angled, broadly winged in Chinese species with wings equal, papery, transversely striate; endocarp not sclerenchymatous.

About 250 species: mostly in tropical and S Africa, also in tropics of America and Asia, and Madagascar; eight species (one endemic) in China.

*Cacoucia chinesis* A. Jussieu ex Candolle (Prodr. 3: 22. 1828) was said to have originated in China. The application of this name is unclear. The fruit was described as 5-angled.

*Combretum chinense* Roxburgh ex G. Don (Trans. Linn. Soc. London 15: 432. 1827) was said by its author to have originated from China. It was treated by Exell (in Steenis, Fl. Males., ser. 1, 4: 540. 1954), who apparently did not see the type, as a name of uncertain application. Nanakorn

Combretum insigne Van Heurck & Müller Argoviensis; Poivrea pilosa (Roxburgh) Wight & Arnott.

Lianas to 20 m tall. Bark grayish brown. Branchlets, petioles, and inflorescence rachis densely ferrugineous tomentose and white villous. Leaves opposite or subopposite; petiole 2–7 mm; leaf blade abaxially pale green, adaxially deep green, ovate-oblong, elliptic, or narrowly elliptic, 5–15 × 2–7 cm, abaxially glabrous or villous or villous on midvein, adaxially sparsely white verruculose; tomentose when young, glabrous or villous on midvein and lateral veins when mature, without tufts of hairs in axes of lateral veins, base obtuse, truncate, or shallowly cordate, apex mucronate or acuminate; lateral veins in 5–8(–10) pairs. Inflorescences terminal and axillary, densely compound spikes 3–10 cm, usually crowded at branchlet apex and forming a dense, leafy panicle. Combretum tube pale green, distally funnelform, 7–8 mm, abaxially ferrugineous tomentose and villous; lobes 5, erect, deltoid, 1–2 mm, apex acute. Petals 5, reddish, pink, or yellowish, rarely white, oblong or oblong-ob lanceolate, 4–5 mm, villous. Stamens 10, exerted, 7–8 mm, obviously exceeding petals. Fruit pink or vivid pink, glossy, ellipsoid or obvoid, 5-winged, 2.5–3.5 × 2.5 cm, densely villous when young, glabrescent when old, sparsely red scaly. Fl. Dec–Apr, fr. Feb–Mar.

Forests, sparse forests, thickets, sparse dry scrub, among shrubs on stream banks, ravines; 100–800 m. Hainan, S Yunnan [Bangladesh, Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

2. Combretum roxburghii Sprengel, Syst. Veg. 2: 331. 1825.

Combretum decandrum Roxburgh, Pl. Coromandel 1: 43. 1796, not Jacquin (1760); Pentaplera roxburghii Tulasne, nom. illeg. spurfl.; Poivrea roxburghii Candolle, nom. illeg. spurfl.

Lianas. Branchlets reddish villous when young. Leaves opposite; petiole 5–7 mm, with a tuft of hairs distally; leaf blade oblong-elliptic to obovate-oblong, 6–13(–15) × 3–6(–7) cm, both surfaces glabrous except abaxially very sparsely hairy, less sparsely so on veins, with or without tufts of hairs in axes of lateral veins, neither surface white verruculose, base obtuse or obtuse-rounded, apex obtuse, caudate; lateral veins in 6 or 7
pairs. Inflorescences terminal and axillary, laxly compound spikes 5–15 cm, usually grouped at branchlet apex and forming a ± lax, leafy panicle; bracts persistent at anthesis, lanceolate, 4–6 mm, tomentose. Calyx tube distally cupular, 3–5 mm, abaxially golden tomentose; lobes 5, broadly triangular, ca. 1 mm, apex aristate. Petals 5, obovate-oblong, ca. 2 mm, both surfaces yellow villous. Stamens 10, only slightly exserted, ca. 2 mm, not exceeding petals. Fruit glossy, cylindric, 5-winged, 2–3 × 0.8–1 cm, glabrous, apex acuminate.

Habitat and elevation not recorded. S Guangxi, SW Yunnan [Bangladesh, India, Laos, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

In botanical literature, this species has variously been called *Combretum decandrum*, by those presumably unaware of Jacquin’s earlier homonym for a New World species, or *C. roxburghii*, which was published by Sprengel (Syst. Veg. 2: 331. 1825) as a nomen novum for Roxburgh’s name.


盾鳞风车子 dun lin feng che zi

Lianas to 8 m tall; stems to 3 cm in diam. Surface scales obvious, white to ferruginous, peltate, ca. 0.2 mm in diam. Branchlets together with petioles glabrous and sparsely to densely scaly. Leaves opposite; petiole 5–12 mm; leaf blade lanceolate, ovate-lanceolate, or narrowly elliptic, 5–10 × 3–6(–7) mm, both surfaces glabrous, sparsely to densely scaly, abaxially more densely so, base obtuse-rounded, apex abruptly caudate, cauda with rounded or obtuse tip; lateral veins in 4–6 pairs. Inflorescences terminal and axillary, compound, spikes 4–12 cm, usually grouped at branchlet apex and forming a panicle; axes glabrous, densely scaly; distal, flower-bearing part of spikes very condensed, capitate, not longer than 0.5 cm, or broadly cylindric or cylindric, 1–5 cm; bracts caducous, linear, very small. Flowers fragrant. Calyx tube distally funnelform-cupular, 5–7 mm, abaxially glabrous, densely scaly, adaxially with a ring of dense, coarse hairs not or only slightly exserted; lobes 4, broadly triangular, 0.5–1 mm, apex obtuse. Petals 4, white, 1.5–2 mm, clawed; limb obovate, narrowly elliptic, or oblancocele. Stamens 8, exserted, ca. 4 mm. Fruit mid-brown, variable in shape and size, oblitate, suborbicular, broadly ovoid, obovoid, or pyriform, 4-winged, 1.3–4 × 1.3–3.5 cm, glabrous, sparsely to densely scaly. Fl. Mar–Apr, fr. Apr–Jul.

Forests, thickets; 500–1500 m. SW Guangdong, S Guangxi, Hainan, S Yunnan [Bangladesh, Bhutan, India, Indonesia, Malaysia, Thailand, Vietnam].


榄形风车子 lan xing feng che zi

Lianas to 2.5 m tall. Branchlets together with petioles glabrous and densely scaly. Leaves opposite; petiole 10–17 mm; leaf blade broadly elliptic, 7–13 × 5–8.5 cm, both surfaces glabrous, abaxially densely yellowish or brownish minutely scaly, adaxially white scaly and densely verruculose, base obtuse or subacute, apex obtuse and mucronate or shortly acuminate; lateral veins in 7 or 8 pairs. Inflorescences terminal and axillary, dichasially compound spikes 5–13 cm, usually grouped at branchlet apex and forming a panicle; axes densely villous, inconspicuously scaly; distal, flower-bearing part of spikes very condensed and forming obconic to hemispheric capitula; bracts caducous, linear, very small. Calyx tube distally funnelform, 11–13 mm, abaxially glabrous but yellow scaly at first, becoming smooth after anthesis, adaxially with a ring of dense, coarse hairs not exserted; lobes 4, reflexed, deltoid, ca. 2 mm, apex acute or shortly acuminate. Petals 4, white, obovate-elliptic or obovate, ca. 1.5 mm, apex obtuse-rounded or retuse. Stamens 8, exserted, 5–6 mm. Fruit subglobose, 4-winged, 2–3.5 × 2–2.5 cm, yellow or red scaly. Fl. Jul–Aug, fr. Aug.

Dense woods, dry thickets on sandy soil; 300–600 m. SW Guangxi (Longzhou), Hainan, Yunnan [Indonesia, Malaysia, Singapore, Thailand, Vietnam].

*Combretum oliviforme* was said to differ from *C. sundiacum* in having a distally cylindric-funnelform calyx tube and fusiform (vs. sub-
Combretum latifolium Blume, Bijdr. 641. 1826.

Combretum cyclophyllum Steudel; C. extensum Roxburgh ex G. Don; C. formosum Griffith (1854), not G. Don (1827); C. horsfieldii Miquel; C. leucanthemum Van Heurck & Müller Argoviensis; C. macrophyllum Roxburgh; C. micropetalum Llanos (1856), not Candolle (1828); C. platyphyllum Van Heurck & Müller Argoviensis; C. rotundifolium Roxburgh (1832), not Richard (1792); C. wightianum Wallich ex Wight & Arnott; Embryogonia latifolia (Blume) Blume.

Lianas large, to 30 m tall. Branchlets together with petioles usually glabrous, scaly. Leaves opposite; petiole 10–25 mm; leaf blade broadly elliptic or ovate-elliptic, 7–20 × 5–10(–13) cm, both surfaces glabrous, sparsely or not scaly, not white verruculose, base obtuse-rounded, apex obtuse or attenuate; lateral veins in 6–8 pairs, axils with small, rounded pits abaxially. Inflorescences axillary, compound, broadly cylindric, densely flowered spikes 6–10 cm, sometimes grouped at branchlet apex and forming a panicle; axes densely minutely tomentose; bracts weakly persistent at anthesis, filiform-linear, very small. Flowers very fragrant. Calyx tube in middle part funnelform, distally narrowly cupular, 5–7 mm, abaxially coarsely hairy and glossy yellow scaly, adaxially with a ring of dense, coarse hairs not or only slightly exserted; lobes 4, erect, deltoid or broadly triangular, 1–1.5 mm, apex acuminate. Petals 4, white or yellowish white, 1.5–2 mm, clawed; limb oblong-obovate, apex obtuse-rounded or slightly mucronate. Stamens 8, exserted, 4–4.5 mm. Fruit red or purple-red when mature, globose or oblate, 4-winged, 1.5–2.5 × 1.5–2.7 cm, glabrous, yellow or orange-yellow scaly. Fl. May–Sep, fr. Aug–Dec.

● Forests, woodlands, open thickets, valleys, river- and stream-sides, swamps, plains; near sea level to 800 m. Guangdong, Guangxi, S Hunan (Yizhang), S Jiangxi (Longnan).

Plants of Combretum alfredii with simple spikes in the leaf axils may be difficult to separate from C. wallichii. The name C. kwangsiense was given to plants from Guangxi with fruit at the small end of the range of variation.

The fruit is edible.


Lianas to 6 m tall. Bark longitudinally fibrous peeling, sparsely black lenticellate. Branchlets together with petioles puberulous and densely brown scaly, glabrescent. Leaves opposite or subopposite; petiole 4–10 mm; leaf blade variable in shape, oblong-elliptic, elliptic, broadly elliptic, ovate, obovate, or suborbicular, 4–15 × 2–7 cm, both surfaces glabrous at maturity except abaxially often with tufts of brown to white hairs in axils of lateral veins, or rarely abaxially persistently sparsely ferruginous pilose and densely so on veins, both surfaces usually not scaly but often densely green or white verruculose, base attenuate or obtuse-rounded, apex acuminate, or rounded or obtuse-rounded and mucronate; lateral veins in 5–9 pairs. Inflorescences terminal and axillary, simple, narrowly cylindric spikes 3–9 cm, sometimes grouped at branchlet apex and forming a panicle; axes puberulous, brown scaly; bracts caducous, linear or linear-lanceolate, 2.5–4.5 mm. Flowers strongly scented. Calyx tube in middle part broadly funnelform, distally broadly campanulate to salverform, 3.5–5 mm, adaxially glabrous and brown scaly, adaxially with a ring of exserted, dense, coarse hairs; lobes 4, erect, deltoid or broadly triangular, 1–1.5 mm, apex acuminate or shortly so. Petals 4, yellow to green, ca. 1.5 mm, clawed; limb oblanceolate. Stamens 8, exserted, ca. 5 mm. Fruit globose (e.g., drawing in Fl. Malay., ser. 1, 4: 543. 1954) and the holotype of C. oliviforme var. yaxianense was said to differ from C. oliviforme in its subglobose fruit. The holotype of var. yaxianense (Hainan: C. Wang 33616, IBSC) is a branch with mature fruit. There therefore seems no justification to separate any of the Chinese plants from C. sudaicium.


Müller Argoviensis; ex Hance, J. Bot. 9: 131. 1871 ["alfredi"].

The fruit is edible.

Combretum kwangsiense H. L. Li.

Lianas to 6 m tall. Bark grayish, young parts with scales. Branchlets together with petioles densely brownish yellow tomentose and orange-yellow scaly, glabrous when old. Leaves opposite or subopposite; petiole 7–15 mm; leaf blade usually elliptic or oblong-elliptic, 10–20(–25) × 4–11 cm, abaxially glabrous except for tufts of coarse hairs in axils of lateral veins, sometimes also coarsely hairy on veins, yellow-brown or orange-yellow scaly and green verruculose, adaxially glabrous and densely white verruculose, base cuneate, rarely obtuse-rounded, apex acuminate; lateral veins in 6–10 pairs. Inflorescences terminal and axillary, simple and compound, narrowly cylindric spikes 5–15 cm, often grouped at branchlet apex and forming a large panicle; axes brownish yellow tomentose and orange-yellow scaly; bracts persistent at anthesis, linear, ca. 1 mm. Flowers fragrant. Calyx tube in middle part funnelform, distally cupular, 5–7 mm, abaxially coarsely hairy and glossy yellow scaly, adaxially with a ring of dense, coarse hairs not or only slightly exserted; lobes 4, erect, deltoid or broadly triangular, 1–1.5 mm, apex acuminate. Petals 4, white or yellowish white, 1.5–2 mm, clawed; limb oblong-obovate, apex obtuse-rounded or slightly mucronate. Stamens 8, exserted, 4–4.5 mm. Fruit red or purple-red when mature, globose or oblate, 4-winged, 1.5–2.5 × 1.5–2.7 cm, glabrous, yellow or orange-yellow scaly. Fl. May–Sep, fr. Aug–Dec.

● Forests, woodlands, open thickets, valleys, river- and stream-sides, swamps, plains; near sea level to 800 m. Guangdong, Guangxi, S Hunan (Yizhang), S Jiangxi (Longnan).

Plants of Combretum alfredii with simple spikes in the leaf axils may be difficult to separate from C. wallichii. The name C. kwangsiense was given to plants from Guangxi with fruit at the small end of the range of variation.

The fruit is edible.


石风车子

Combretum kwangsiense H. L. Li.

Lianas to 6 m tall. Bark longitudinally fibrous peeling, sparsely black lenticellate. Branchlets together with petioles puberulous and densely brown scaly, glabrescent. Leaves opposite or subopposite; petiole 4–10 mm; leaf blade variable in shape, oblong-elliptic, elliptic, broadly elliptic, ovate, obovate, or suborbicular, 4–15 × 2–7 cm, both surfaces glabrous at maturity except abaxially often with tufts of brown to white hairs in axils of lateral veins, or rarely abaxially persistently sparsely ferruginous pilose and densely so on veins, both surfaces usually not scaly but often densely green or white verruculose, base attenuate or obtuse-rounded, apex acuminate, or rounded or obtuse-rounded and mucronate; lateral veins in 5–9 pairs. Inflorescences terminal and axillary, simple, narrowly cylindric spikes 3–9 cm, sometimes grouped at branchlet apex and forming a panicle; axes puberulous, brown scaly; bracts caducous, linear or linear-lanceolate, 2.5–4.5 mm. Flowers strongly scented. Calyx tube in middle part broadly funnelform, distally broadly campanulate to salverform, 3.5–5 mm, adaxially glabrous and brown scaly, adaxially with a ring of exserted, dense, coarse hairs; lobes 4, erect, deltoid or broadly triangular, 1–1.5 mm, apex acuminate or shortly so. Petals 4, yellow to green, ca. 1.5 mm, clawed; limb oblanceolate. Stamens 8, exserted, ca. 5 mm. Fruit
purple or red, glossy, ± globose, 4-winged, 1.7–3.3 × 1.8–3 cm, glabrous, white or golden scaly. Fl. Mar–Aug, fr. Jul–Nov.

Mixed forests, woods, thickets, scrub, mountain slopes and valleys, shaded limestone ravines, streambeds, roadsides; (500–)800–2200(–3200) m. Guangxi, Guizhou, Sichuan, Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, N Vietnam].

The record from N Vietnam (Cao Bang, in 1999) is apparently new and is based on P. K. Loc et al. CBL 1351 (MO).

Combretum wallichii var. pubinerve C. Y. Wu (Fl. Yunnan. 1: 90. 1977), described from W Yunnan (Lushui i), differs from typical C. wallichii in having a suborbicular leaf blade, abaxially sparsely ferruginous pilose at maturity, densely so on veins. Because the species is so variable in leaf blade shape, only the hairiness would reliably separate var. pubinerve, and that character does not seem sufficient to justify formal recognition of a variety.

Combretum auriculatum C. Y. Wu & T. Z. Hsu (in C. Y. Wu, Fl. Yunnan. 1: 90. 1977), described from SW Yunnan (Cangyuan), appears to be a form of C. wallichii with a ± oblanceolate leaf blade slightly auriculate-cordate at the base. The name is illegitimate because it is a later homonym of C. auriculatum Engler & Diels (in Engler, Monogr. Afric. Pflanzen-Fam. 3: 79. 1889), described from tropical Africa.

Gangopadhyay & Chakrabarty (J. Econ. Taxon. Bot. 17: 679–682. 1993) recognized six varieties within Combretum wallichii: the typical variety, three varieties from outside China, and two varieties based on C. griffithii and C. yunnanense. The last two taxa are indeed similar to C. wallichii but, in the present treatment, we prefer to maintain C. griffithii separately, including C. yunnanense within it as C. griffithii var. yunnanense.


西南风车子 xi nan feng che zi

Lianas woody, to 10 m tall. Branchlets glabrous or pilose, ferruginous scaly. Leaves opposite, subopposite, or alternate, rarely 3-whorled; petiole 6–13 mm, pilose and ferruginous scaly; leaf blade usually elliptic or oblong-elliptic, 6–15(–18) × 3–7(–9) cm, both surfaces glabrous, or pilose and glabrescent with age but remaining pilose on veins, ferruginous minutely scaly, more densely so abaxially, not verruculose, base obtuse-rounded or attenuate, apex acute or cuspidate to caudate-acuminate; lateral veins in 6–12 pairs. Inflorescences terminal and axillary, simple, narrow, cylindric spikes 4–10 cm, sometimes grouped at branchlet apex and forming a panicule; axes pilose and ferruginous scaly; bracts persistent at anthesis, filiform-linear, 3–7 mm, pilose. Calyx tube in middle part narrowly funnelform, distally cupular, 5.5–7 mm, abaxially glabrous, densely ferruginous scaly, adaxially with a ring of dense, coarse hairs not or only slightly exserted; lobes 4, erect, deltoid, ca. 1 mm, apex acute or subacutate. Petals 4, white to yellow or yellowish green, 2–2.5 cm, clawed; limb obovate or oblanceolate. Stamens 8, exerted, 3–5 mm. Fruit brown, globose, 4-winged, 2–3.5 × 2–4 cm, glabrous, densely white and/or brown minutely scaly. Fl. Apr–Jun, fr. Jul–Dec.

Forests, sparse forests, woods, thickets by streams, mountain slopes and valleys, ravines, riversides; 500–1600(–2000) m. S and W Yunnan [Bangladesh, Bhutan, India, Laos, Malaysia, Myanmar, Thailand, Vietnam].

1a. Both surfaces of leaf blade glabrous ....... 8a. var. griffithii
1b. Both surfaces of leaf blade pilose, glabrescent with age but remaining pilose on veins ....................... 8b. var. yunnanense

8a. Combretum griffithii var. griffithii

西南风车子 (原变种) xi nan feng che zi (yu an bian zhong)


Forest, sparse forests, mountain slopes and valleys; (600–)1100–1600 m. S Yunnan [Bangladesh, Bhutan, India, Laos, Malaysia, Myanmar, Thailand, Vietnam].

Combretum yuankiangense C. C. Huang & S. C. Huang ex T. Z. Hsu (in C. Y. Wu, Fl. Yunnan. 1: 93. 1977), described from S Yunnan (Yuanjiang) appears to be a form of C. griffithii var. griffithii. It has an axially sparsely scaly leaf blade (vs. densely so in typical C. griffithii var. griffithii), obtuse-rounded or retuse at the apex (vs. cuspidate or acuminate), and an ellipsoid fruit, 2–2.6 × 1.2–1.6 cm. The narrowness of the fruit may be a result of its having been immature when collected (cf. comments on C. oliviforme under C. sundacum above).

8a. Combretum griffithii var. yunnanense (Exell) Turland & C. Chen, comb. nov.

云南风车子 yun nan feng che zi

Basionym: Combretum yunnanense Exell, Sunyatsenia 1: 88. 1933; C. wallichii var. yunnanense (Exell) M. G. Gango padhyay & Chakrabarty.


Forest, sparse forests, woods, thickets by streams, mountain valleys, ravines, riversides; 500–1600(–2000) m. S and W Yunnan [Myanmar, Thailand].

Exell described Combretum yunnanense from Yunnan, based on A. Henry 11891A (BM, holotype; E, K, MO, isotypes), mentioning that the species also grows in “Burma and the Malay Peninsula.” Several additional gatherings from Yunnan were cited in the protologue, including A. Henry 12509A, A. Henry 125809A (A, BM, E, K, MO), which, with leaf blades glabrous on both surfaces, correspond with C. griffithii. Clearly C. yunnanense is very close morphologically to C. griffithii and occurs within the E part of the distribution of the latter species. It seems more appropriate, therefore, to treat C. yunnanense at varietal rank under C. griffithii.

When Exell (in Steenis, Fl. Males., ser. 1, 4: 540. 1954) gave a much broader distribution for Combretum yunnanense, as “Bengal?, Assam?, Yunnan, ... Sumatra, Malay Peninsula, and NW. Borneo,” his circumscription included the taxon later separated as C. chinense (see note under genus heading).