

2. SAMBUCUS Linnaeus, Sp. Pl. 1: 269. 1753.

接骨木属 jie gu mu shu

Yang Qiner (杨亲二); David E. Boufford

Shrubs, small trees, or perennial herbs, gynodioecious or hermaphroditic, deciduous, whole plant sometimes with extrafloral nectariferous glands. Branches smooth, striate, or warty, with stout pith. Leaves with or without stipules, imparipinnate, or incompletely bipinnate, rarely laciniate; leaflets serrate or divided, opposite or alternate. Inflorescences terminal, flat or convex corymbs or panicles, pedunculate or sessile. Flowers actinomorphic or sometimes dimorphic, sometimes with glandular nectaries, articulate with pedicel; bracts mostly absent; bracteoles 1 or absent. Calyx tube: limb 3–5-parted; corolla rotate, white, lobes 3–5. Stamens 5, inserted at base of corolla; filaments erect, filiform; anthers 2-celled, oblong, cells free, attached at middle. Ovary locules 3–5, ovules 1 per locule; style cushionlike; stigmas 3 or 5. Fruit berrylike, 3–5-seeded; seeds triquetrous or ellipsoid; embryo ca. as long as seed.

About ten species: temperate to subtropical regions and tropical mountains; four species (one endemic) in China.

See Bolli, Diss. Bot. 223: 1–227. 1994; Eriksson and Donoghue, Syst. Bot. 22: 555–573. 1997.

Sambucus nigra Linnaeus (Sp. Pl. 1: 269. 1753) is occasionally cultivated in China.

In some species, the vegetative parts of the plant when bruised and the flowers have a fetid odor.

- 1a. Perennial herbs or shrubs; lenticels absent or inconspicuous; young branches striate; inflorescences flat topped, umbellate cymes.
 - 2a. All flowers hermaphroditic, rotate; lenticels inconspicuous or absent; lateral leaflets without glandular teeth; terminal leaflet narrowly cuneate, often decurrent and connected to next lower leaflet pair; pith of roots red or white; pyrenes rugose or smooth 1. *S. adnata*
 - 2b. Some flowers sterile, urceolate; lenticels inconspicuous; lateral leaflets with 2–4 glandular teeth below middle and at base; terminal leaflet rounded to cuneate at base, not or only slightly decurrent; pith of roots white; pyrenes tuberculate 2. *S. javanica*
- 1b. Shrubs or small trees; lenticels conspicuous; young branches rounded; inflorescences and infructescences pyramidal paniculate cymes.
 - 3a. Petiolules, foliar axis, and abaxial surface of leaflets glabrous 3. *S. williamsii*
 - 3b. Petiolules, foliar axis, and veins at base of abaxial surface of leaflets hairy 4. *S. sibirica*

1. *Sambucus adnata* Wallich ex Candolle, Prodr. 4: 322. 1830.

血满草 xue man cao

Sambucus schweriniana Rehder.

Herbs, suffrutescent, or low shrubs, 1–2 m tall, rhizomatous. Pith of roots and rhizomes white or red. Stem herbaceous, obviously striate; pith white or red; lenticels absent. Leaves imparipinnate; stipules bladelike or linear; leaflets 3–5 pairs, narrowly elliptic to narrowly ovate or lanceolate, 4–15 × 1.5–2.5 cm, abaxially sparsely pubescent, more densely pubescent on veins, base obtuse and oblique, margin serrate, apex acuminate; terminal pair of leaflets often connate at base along rachis, sometimes connected also with terminal leaflet, remaining leaflets alternate or sometimes subopposite; stipules of leaflets reduced to urceolate glands. Inflorescences terminal, pedunculate, with 3–5 rays, umbellate cymes, 12–15 cm broad and tall, with dense yellow pubescence when young and ± glandular hairy. Flowers all normal, not reduced to glands, 4–5 mm in diam.; calyx urceolate, pubescent; corolla white; filaments dilated at base, anthers yellow; ovary locules 3; styles short or nearly absent; stigma 3-lobed. Fruit orange or red, becoming black on drying, globose, 3–4 mm in diam.; pyrenes ovoid, ca. 2 × 1.5 mm, rugose or smooth. Fl. May–Jul(–Sep), fr. Sep–Oct. *2n* = 36*.

Forests, thickets, streamsides, moist shaded mountain slopes, alpine grasslands; 1600–3600 m. Gansu, Guizhou, Hubei, Ningxia, Qing-

hai, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, India (Darjeeling, Sikkim)].

2. *Sambucus javanica* Blume, Bijdr. 657. 1825.

接骨草 jie gu cao

Ebulus chinensis (Lindley) Nakai; *E. formosana* (Nakai) Nakai; *Sambucus argyi* H. Léveillé; *S. chinensis* Lindley; *S. chinensis* var. *formosana* (Nakai) H. Hara; *S. chinensis* var. *pinnatilobata* G. W. Hu; *S. formosana* Nakai; *S. formosana* var. *arborescens* Kanehira & Sasaki; *S. henriana* Samutina; *S. hookeri* Rehder; *S. javanica* var. *argyi* (H. Léveillé) Rehder; *S. javanica* subsp. *chinensis* (Lindley) Fukuoka.

Herbs, suffrutescent, or low shrubs, 1–2 m tall. Stem obviously striate; pith white; lenticels inconspicuous. Leaves imparipinnate; stipules leaflike or sometimes reduced to blue glands; lateral leaflets 2 or 3 pairs, alternate or opposite, narrowly ovate, 6–13 × 2–3 cm, adaxially sparsely pubescent when young, base obtuse and oblique, margin serrulate, often with 1 to several glandular teeth from below middle nearly to base, apex long acuminate; terminal leaflet ovate or obovate, base cuneate, sometimes connected with next lower leaflets, basal pair of leaflets shortly petiolulate; stipules of leaflets absent. Inflorescences terminal, compound umbellate cymes, lax, pedunculate, with leaflike bracts at base of peduncle, with 3–5 slender rays, with sparse yellow pubescence. Some flowers modified into persistent urceolate nectaries. Flowers: calyx tube

urceolate, lobes triangular; corolla white, connate at base; anthers yellow or purple; ovary locules 3; styles short or nearly absent; stigma 3-lobed. Fruit red, subglobose, 3–4 mm in diam.; pyrenes 3 or 4, ovoid, ca. 2.5 mm, verrucate. Fl. Apr–May(–Aug), fr. Aug–Sep.

Mountain slopes, forests, streamsides, grasslands; 300–2600 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

Sambucus javanica often has abundant extrafloral nectaries on the petioles, branchlets, young stems, peduncle, and inflorescence branches.

3. *Sambucus williamsii* Hance, Ann. Sci. Nat., Bot., sér. 5, 5: 217. 1866.

接骨木 jie gu mu

Sambucus barbinervis Nakai; *S. buergeriana* (Nakai) Blume ex Nakai; *S. buergeriana* f. *cordifoliata* Skvortsov & W. Wang; *S. foetidissima* Nakai; *S. junnanica* J. J. Vassiljev; *S. latipinna* Nakai var. *pendula* Skvortsov; *S. manshurica* Kitagawa; *S. peninsularis* Kitagawa; *S. potaninii* J. J. Vassiljev; *S. racemosa* Linnaeus subsp. *manshurica* (Kitagawa) Voroschilov; *S. sieboldiana* (Miquel) Blume ex Schwerin var. *buergeriana* Nakai.

Shrubs or small trees, 5–6 m tall. Old branches reddish brown, with conspicuous, narrowly elliptic lenticels; pith brownish. Leaves imparipinnate; leaflets (1 or)2- or 3(–5)-jugate; lateral leaflets ovate-orbicular or narrowly elliptic to oblong-ob lanceolate, 5–15 × 1.2–7 cm, base cuneate or rounded, sometimes cordate, asymmetrical, margin irregularly serrate, sometimes with 1 to several glandular teeth at base or below middle, apex acute to acuminate or caudate; lowest pair of leaflets sessile or petiole to ca. 0.5 cm; terminal leaflet ovate or obovate, adaxially sparsely pubescent when young, glabrescent, petiolule ca. 2 cm, base cuneate, apex acuminate or caudate; stipules narrowly linear or reduced to bluish protrusions. Inflorescences terminal cymose panicles, 5–11 × 4–14 cm, pedunculate, sometimes sparsely pubescent, soon glabrescent. Flowers appearing simultaneously with leaves, dense; calyx tube urceolate, ca. 1 mm, lobes triangular-lanceolate, slightly shorter than tube; corolla pinkish in bud, white or yellowish when open; tube short; lobes oblong or narrowly ovate-orbicular, ca. 2 mm; stamens spreading, ca. as long as corolla lobes; filaments slightly dilated at base; anthers yellow; ovary 3-loculed; styles short; stigmas 3-lobed. Fruit red, rarely bluish or purplish black, ovoid or subglobose, 3–5 mm in diam.; pyrenes 2 or 3, ovoid to ellipsoid, 2.5–3.5 mm, slightly rugose. Fl. Apr–May, fr. Sep–Oct. $2n = 36^*$.

• Mountain slopes, scrub, streamsides, roadsides, beside houses; 500–1600 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang.

Sambucus williamsii was treated as a synonym of a highly variable, circumboreal *S. racemosa* Linnaeus by Bolli (Diss. Bot. 223: 187–197. 1994). The black fruit and dark green leaves (Bolli, loc. cit.) distinguish *S. williamsii* and *S. melanocarpa* A. Gray of W North America from other members of the *S. racemosa* complex. *Sambucus williamsii* also has a more pronounced fetid odor. Because of the high degree of

variation and the pronouncement by Bolli (loc. cit.) that the variation within his circumscription of *S. racemosa* should be further evaluated in a geographic context through field, cytological, and biochemical methods, for the time being, we prefer to maintain *S. williamsii*, and, with less certainty, the following species, *S. sibirica*, as distinct.

4. *Sambucus sibirica* Nakai, Bot. Mag. (Tokyo) 40: 478. 1926.

西伯利亚接骨木 xi bo li ya jie gu mu

Sambucus buergeriana (Nakai) Blume ex Nakai var. *miquelii* Nakai; *S. racemosa* Linnaeus subsp. *sibirica* (Nakai) H. Hara; *S. williamsii* Hance var. *miquelii* (Nakai) Y. C. Tang ex J. Q. Hu.

Shrubs, 2–4 m tall, densely branched. Bark reddish brown, longitudinally sulcate, with elliptic lenticels; pith brownish; young branches yellowish white hirsute, sometimes papillose. Leaflets 2-jugate, abaxially pale, adaxially green, ovate-lanceolate to lanceolate, 5–14 × 1.6–5.5 cm, midvein long hirsute, base cordate and oblique, margin irregularly acutely toothed, apex long acuminate; petiolule and leaf rachis yellow hirsute; stipules glandular. Inflorescence an erect cymose panicle, 3.5–5 cm; peduncle papillose. Flowers opening with leaves; calyx tube urceolate, ca. 1 mm, lobes triangular-lanceolate, slightly shorter than tube; corolla greenish or yellowish, lobes oblong; stamens yellowish brown; anthers yellow; ovary 3-loculed; styles short; stigmas 3-lobed. Fruit red, ovoid or subglobose, 3–5 mm in diam.; pyrenes 2 or 3, ovoid to ellipsoid, 2.5–3.5 mm, slightly rugose. Fr. Jul–Aug. $2n = 18, 36, 38^*$.

Rocky mountain slopes, rock crevices along rivers. Heilongjiang, Jilin, Liaoning, Xinjiang [Mongolia, Russia].

Sambucus sibirica should perhaps be included within *S. williamsii*. The differences separating them, i.e., young branches, petiolule, and leaf rachis slightly pubescent vs. glabrous in *S. williamsii*, are minor.

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