

2. AESCULUS Linnaeus, Sp. Pl. 1: 344. 1753.

七叶树属 *qi ye shu shu*

Xia Nianhe (夏念和); Nicholas J. Turland

Actinotinus Oliver, p.p.; *Hippocastanum* Miller; *Pavia* Miller.

Trees or shrubs, deciduous. Winter buds large, viscid resinous or not, with several pairs of imbricate scales; scales abaxially glabrous or sparsely puberulent. Leaf blade 5–11-foliolate; leaflet blades without scattered, conspicuous glands, margin crenate to serrate or compoundly so. Thyrses cylindrical or conic; branches simple; bracts absent. Flowers often large and showy. Sepals connate to form a tubular to campanulate calyx tube. Petals often unequal, base clawed, limb obovate, oblong, oblanceolate, or spatulate. Ovary without a gynophore; style long, slender; stigma depressed globose, entire or obscurely lobed. Capsule depressed globose to pyriform, without a long gynophore, often 1-seeded; pericarp usually smooth, often dotted, rarely verrucose or prickly. Seeds depressed globose to pyriform, large (2–7 cm); testa brown; hilum large, pale, occupying 1/3–1/2 of seed. $x = 20$.

Twelve species: mainly in North America (United States, Baja California in Mexico) and Asia from the Himalayas to Japan (Afghanistan, Bangladesh, Bhutan, China, India, Japan, Kashmir, Laos, Myanmar, Nepal, Pakistan, Thailand, Vietnam), one species in SE Europe (Albania, Bulgaria, Greece, former Yugoslavia); four species (one endemic, two introduced) in China.

Fang (Acta Sci. Nat. Univ. Szechuan. 1960(3): 77–125. 1962) published a revision of the Hippocastanaceae in China, including 12 new species, for which six of the names were not validly published, either because no Latin description was provided, no type was indicated, or more than one type was indicated. Fang later (in FRPS) identified three of these entities as species of Araliaceae: “*Aesculus chingsiensis*” as *Acanthopanax evodiifolius* Franchet, “*Aesculus chinpingensis*” as *Brassaiopsis glomerulata* (Blume) Regel, and “*Aesculus kwangsiensis*” as *Schefflera octophylla* (Loureiro) Harms.

The W Himalayan *Aesculus indica* (Wallich ex Cambessèdes) Hooker (Bot. Mag. 85: t. 5117. 1859; *Pavia indica* Wallich ex Cambessèdes in Jacquemont, Voy. Inde 4(Bot.): 31. 1841) is distributed from NE Afghanistan, through N Pakistan, Kashmir, and N India, to C Nepal, and might yet be found in adjacent parts of Xizang in China.

The leaves, flowers, and large seeds contain the poisonous compound aesculin.

- 1a. Capsule dotted but smooth; thyrses cylindrical, often long, 15–45 cm; leaflets usually petiolulate, petiolules to 2.5(–3) cm.
 - 2a. Petals white with yellow spots, subequal, oblong-obovate to oblong-oblanceolate, 8–14 × 3–5 mm; anthers 1–1.5 mm; petiolules 0.5–2.5(–3) cm, leaflet blades adaxially matt mid-green, 8–25(–30) cm 1. *A. chinensis*
 - 2b. Petals white or pale yellow with purple or brown spots, unequal, 2 spatulate to oblong and 2 oblong-obovate or obovate, 13–22 × 3–7 mm; anthers 1.5–3 mm; petiolules nearly absent to 1.5 cm, leaflet blades adaxially glossy dark green, (7–)12–35(–42) cm 2. *A. assamica*
- 1b. Capsule prickly or verrucose; thyrses conic or cylindrical-conic, 15–30(–45) cm; leaflets sessile or subsessile.
 - 3a. Capsule broadly obovoid or pyriform, verrucose; leaflets abaxially slightly glaucous, margin crenate with crenations crenulate 3. *A. turbinata*
 - 3b. Capsule subglobose, prickly; leaflets abaxially green, margin serrate with teeth serrulate 4. *A. hippocastanum*

1. *Aesculus chinensis* Bunge, Enum. Pl. China Bor. 10. 1833.

七叶树 *qi ye shu*

Trees to 25 m tall, to 2.5 m d.b.h. Branchlets glabrous or puberulent to densely villous when young. Petiole 7–15 cm, grayish puberulent or glabrous; leaf blade 5–7(–9)-foliolate; petiolules 0.5–2.5(–3) cm, grayish puberulent or glabrous; leaflet blades oblong-lanceolate, oblong, oblong-oblanceolate, or oblong-obovate, 8–25(–30) × 3–8.5(–10.5) cm, abaxially glabrous, grayish tomentose on veins (sometimes only when young), or ± uniformly grayish tomentose or villous, base cuneate to broadly so, rounded, or slightly cordate, margin serrulate or crenulate-serrulate, apex abruptly acuminate; lateral veins in 13–25 pairs. Inflorescence puberulent or glabrous; peduncle 5–10 cm; thyrses cylindrical, 15–35 cm, 2.5–12(–14) cm wide at base; branches 2–4(–6) cm, 5–10-flowered; pedicels 2–8 mm. Flowers fragrant. Calyx 3–7 mm, abaxially puberulent or glabrous. Petals 4, white, with yellow spots, subequal, oblong-obovate to oblong-oblanceolate, 8–14 × 3–5 mm, abaxially puberulent. Stamens 6 or 7, 18–30 mm; filament glabrous; anther

1–1.5 mm. Style glabrous or villous except at apex. Capsule yellowish brown, ovoid, globose, obovoid, or pyriform, 3–4.5 cm, densely dotted but smooth; pericarp 1–6 mm thick after drying. Seeds 1 or 2, brown, globose or subglobose, 2–3.5 cm in diam.; hilum white, occupying less than 1/3 to ca. 1/2 of seed. Fl. Apr–Jun, fr. Sep–Oct.

• Broad-leaved forests, near streams in tall shady forests, woods, thickets, mountain and hill slopes, ravines, roadsides, also cultivated; below 2000(–2300) m. Native in Chongqing, S Gansu, N Guangdong, Guizhou, SW Henan, W Hubei, Hunan, W Jiangxi, S Shaanxi, Sichuan, and NE Yunnan; cultivated in Hebei, N Henan, S Jiangsu, S Shaanxi, S Shanxi, and N Zhejiang.

Typical *Aesculus chinensis*, described from Beijing, is planted, especially in temple grounds and by houses, and is not known with certainty in a wild state. Cultivated plants from S Jiangsu and N Zhejiang were described as *A. chekiangensis* (reduced to varietal rank under *A. chinensis* in FRPS), but they are scarcely distinguishable from plants in the Beijing region and in fact have some features that were thought to distinguish *A. wilsonii*, namely a thinner pericarp and a smaller hilum. *Aesculus wilsonii* was described from wild plants in

Chongqing, W Hubei, and Sichuan, and in its typical form differs from *A. chinensis* in the above features and in having leaves abaxially pubescent (vs. ± glabrous) with a more rounded base (vs. cuneate). Within the range of *A. wilsonii* occur numerous intermediates with *A. chinensis*, as was noted by Hardin (Brittonia 12: 34. 1960), who hypothesized that the latter species might only be a cultivated form of the former. The comment in FRPS about native plants of *A. chinensis* existing in the Qin Ling mountain range (S Shaanxi) was possibly based on a comment by Rehder (in Sargent, Pl. Wilson 1: 500. 1913), which was questioned by Hardin (loc. cit.), who noted that the specimens he examined from Shaanxi “represent a form of *A. wilsonii*.” Indeed, among the intermediates mentioned above are the same gathering seen by Hardin and another from Mianxian in SW Shaanxi. While extreme forms can easily be assigned to either *A. chinensis* or *A. wilsonii*, the existence of so many intermediates makes it impossible to delimit species and difficult even to justify infraspecific taxa. We have therefore decided to recognize one variable species, *A. chinensis*, but nevertheless to retain a separate status for the wild plants, as var. *wilsonii*.

- 1a. Leaflet blades abaxially glabrous, or grayish tomentose on veins when young, base cuneate to broadly so 1a. var. *chinensis*
 1b. Leaflet blades abaxially ± uniformly grayish tomentose or villous, or grayish tomentose on veins (sometimes only when young), base broadly cuneate to rounded or slightly cordate 1b. var. *wilsonii*

1a. *Aesculus chinensis* var. *chinensis*

七叶树(原变种) *qi ye shu* (*yuan bian zhong*)

Aesculus chekiangensis Hu & W. P. Fang; *A. chinensis* var. *chekiangensis* (Hu & W. P. Fang) W. P. Fang.

Leaflet blades abaxially glabrous, or grayish tomentose on veins when young, base cuneate to broadly so.

• Cultivated, especially in temple grounds and by houses; below 800 m. Hebei, N Henan, S Jiangsu, S Shaanxi, S Shanxi, N Zhejiang.

1b. *Aesculus chinensis* var. *wilsonii* (Rehder) Turland & N. H. Xia, Novon 15: 489. 2005.

天师栗 *tian shi li*

Aesculus wilsonii Rehder in Sargent, Pl. Wilson. 1: 498. 1913; *Actinotinus sinensis* Oliver, p.p.

Leaflet blades abaxially ± uniformly grayish tomentose or villous, or grayish tomentose on veins (sometimes only when young), base broadly cuneate to rounded or slightly cordate.

• Broad-leaved forests, near streams in tall shady forests, woods, thickets, mountain and hill slopes, ravines, roadsides, also cultivated; 600–2000(–2300) m. Chongqing, S Gansu (Kangxian), N Guangdong, Guizhou, SW Henan, W Hubei, Hunan, W Jiangxi, S Shaanxi, Sichuan, NE Yunnan.

Actinotinus was described with a single species, *A. sinensis* (Oliver, Hooker’s Icon. Pl. 18: t. 1740. 1888). It was based on a mixed gathering (Hubei: Badong, *A. Henry 4058*, holotype, K) comprising an inflorescence of a species of *Viburnum* inserted on the terminal bud of a leafy shoot of *Aesculus chinensis* var. *wilsonii*.

2. *Aesculus assamica* Griffith, Not. Pl. Asiat. 4: 540. 1854 [“*assamicus*”].

长柄七叶树 *chang bing qi ye shu*

Aesculus chuniana Hu & W. P. Fang; *A. lantsangensis* Hu & W. P. Fang; *A. megaphylla* Hu & W. P. Fang; *A. polyneura* Hu & W. P. Fang; *A. polyneura* var. *dongchuanensis* X. W. Li & W. Y. Yin; *A. punduana* Wallich ex Hiern, nom. illeg. superfl.; *A. rupicola* Hu & W. P. Fang.

Trees to 32 m tall, to 0.6 m d.b.h. Branchlets glabrous, subglabrous, or puberulent when young. Petiole 8–30 cm, glabrous, subglabrous, or puberulent; leaf blade 5–9-foliolate; petiolules 0.3–1.5 cm (leaflets rarely sessile), glabrous, subglabrous, or sparsely puberulent and dark glandular when young; leaflet blades oblong-lanceolate to oblong-oblongeolate, rarely lanceolate to oblanceolate or narrowly so, (7–)12–35(–42) × (3–)5–18 cm, abaxially glabrous, or puberulent or pilose on veins when young, base cuneate or broadly so or rounded, margin crenulate to serrulate, apex acuminate to caudate; lateral veins in 17–30 pairs. Inflorescence pale yellow puberulent; peduncle 7–13 cm; thyse cylindric, (22–)27–45 cm, 5–14 cm wide at base; branches 2–7 cm, 3–11-flowered; pedicels 3–7 mm. Flowers fragrant. Calyx 4–8 mm, abaxially gray or pale yellowish gray puberulent or finely gray velutinous. Petals 4, white or pale yellow, with purple or brown spots, sometimes orange toward base or claw reddish, unequal, 2 spatulate to oblong and 2 oblong-obovate or obovate, 13–22 × 3–7 mm, abaxially gray puberulent or velutinous. Stamens 5–7, 18–40 mm; filament glabrous; anther 1.5–3 mm. Style glabrous, subglabrous, sparsely puberulent, or tomentose. Capsule yellowish brown, ovoid to obovoid, subglobose, or depressed globose, 4.5–5 × 3–7.5 cm, dotted but smooth; pericarp 1.5–2 mm thick after drying. Seed usually 1, brown, globose, subglobose, or depressed globose, 3–7 cm in diam.; hilum white, occupying ca. 1/2 (rarely ca. 1/3) of seed. Fl. (Jan–)Feb–May, fr. Jun–Nov.

Wet forests, broad-leaved forests, semi-evergreen or mixed deciduous/evergreen broad-leaved forests in limestone hills or mountains, subtropical hill forests, mountain forests, open forests, rocks in forests; 100–2000 m. W Guangxi, S Guizhou (Pingtang), SE Xizang, Yunnan [Bangladesh, Bhutan, NE India, Laos, Myanmar, Thailand, N Vietnam].

Aesculus assamica is a widespread species in the tropical and subtropical monsoon forest zone from NE India (Sikkim) eastward to S China (Guangxi) and N Vietnam. Here belong most of the new species described by Fang (Acta Sci. Nat. Univ. Szechuan. 1960(3): 77–125. 1962), namely *A. chuniana*, *A. lantsangensis*, *A. megaphylla*, *A. polyneura* (including the more recently described var. *dongchuanensis*), and *A. rupicola*, as well as “*A. tsiangii*” and “*A. wangii*,” which were not validly published because in both cases two specimens were indicated as types (consequently “*A. wangii* var. *rupicola*,” in FRPS, was not validly published either). These entities differ from each other in only insignificant details and clearly fall within the range of variation of *A. assamica*. “*Aesculus coriaceifolia*,” also described by Fang (loc. cit.) but not validly published because no Latin description was given and no type was indicated, was already referred to *A. assamica* by Fang (in FRPS).

“*Aesculus khassiyana*” (Das & Majumdar, Bull. Bot. Surv. India 3: 95. 1961), accepted instead of *A. assamica* by Wu (Index Fl. Yunnan. 1: 842. 1984), was not validly published because its supposed basionym, “*Pavia khassiyana*” (Voigt, Hort. Suburb. Calcutt. 97. 1845), is a nomen nudum.

3. *Aesculus turbinata* Blume, Rumphia 3: 195. 1847.

日本七叶树 ri ben qi ye shu

Aesculus turbinata f. *pubescens* (Rehder) Ohwi ex Yas. Endo; *A. turbinata* var. *pubescens* Rehder.

Trees to 30 m tall, to 2 m d.b.h. Branchlets pubescent when young. Petiole 7.5–25 cm, glabrous or pubescent; leaf blade 5–7-foliolate; leaflets sessile, abaxially slightly glaucous, oblanceolate, 15–35 × 5–15 cm, abaxially glabrous except villous in axils of lateral veins, or pubescent and more densely so on veins, base cuneate, margin shallowly crenate with crenations crenulate, apex abruptly acuminate; lateral veins in 18–26 pairs. Inflorescence glabrous or pubescent; peduncle 2–4 cm; thyse conic or cylindric-conic, 12–25(–45) cm, 6–11 cm wide at base; branches up to 5 cm, 5–10-flowered; pedicels 3–4 mm. Calyx 3–5 mm, abaxially pubescent. Petals 4(or 5), white or pale yellow, with red spots and a yellow (later red) claw, unequal, 2 oblong and 2 oblong-obovate, 7–11 × 3–7 mm, abaxially pubescent. Stamens 6–10, 10–18 mm; filament sparsely villous; anther 1–1.5 mm. Style tomentose, sparsely so

near apex. Capsule dark brown, broadly obovoid or pyriform, 2.5–5 cm in diam., verrucose; verrucae low, suborbicular, unequal, 0.5–2 mm in diam.; pericarp 3–6 mm thick after drying. Seed usually 1, reddish brown, ± globose, 2–3 cm; hilum pale brown, occupying ca. 1/2 of seed. Fl. May–Jul, fr. Sep. $2n = 40$.

Introduced to China, cultivated in parks; 100–200 m. Shandong (Qingdao), Shanghai [native to Japan].

Aesculus turbinata is cultivated as an ornamental and for its timber. It has been confused in China with *A. chinensis*, but it differs in several characters, including its sessile (vs. petiolulate) leaflets, crenulate (vs. serrulate) leaflet margin, conic or cylindric-conic (vs. cylindric) thyse, and verrucose (vs. dotted but smooth) capsule.

4. *Aesculus hippocastanum* Linnaeus, Sp. Pl. 1: 344. 1753.

欧洲七叶树 ou zhou qi ye shu

Hippocastanum vulgare Gaertner.

Trees to 30 m tall, to 2(–5) m d.b.h. Branchlets brown villous when young. Petiole 8–20 cm, glabrous; leaf blade 5–7-foliolate; leaflets sessile, abaxially green, oblanceolate, 10–25 × 5–12 cm, abaxially glabrous or with sparse whitish hairs, ferruginous tomentose (often densely so) at base and in axils of lateral veins, base cuneate, margin crenate-serrate with teeth crenulate-serrulate, apex acuminate to subcaudate; lateral veins in 18–25 pairs. Inflorescence glabrous or matted ferruginous villous and shortly whitish tomentose (whitish hairs mostly on pedicels); peduncle 2.5–5 cm; thyse conic or cylindric-conic, 10–30 cm, 6–10 cm wide at base; branches 2.5–5 cm, 4–12-flowered; pedicels 3–6 mm. Calyx 5–6 mm, abaxially tomentose. Petals 4 or 5, white, with red spots and a yellow (later brown) claw, equal, ca. 11 mm, abaxially sparsely whitish tomentose or glabrous. Stamens 5–8, 10–20 mm; filament villous; anther 1–1.3 mm. Style glabrous except at base. Capsule brown, globose or subglobose, 2.5–4 × 2.5–6 cm excluding prickles, prickly; prickles subulate, slightly curved, to 10 mm; pericarp 3–5 mm thick after drying. Seeds 1–3(–6), glossy chestnut brown, subglobose, 2–4 cm; hilum pale brown, occupying 1/3–1/2 of seed. Fl. May–Jun, fr. Sep.

Introduced to China, cultivated. Shandong (Qingdao), Shanghai [native to SE Europe (Albania, Bulgaria, Greece, Former Yugoslavia); widely introduced elsewhere].

This species is easily recognized by its prickly capsule.

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