

23. PANAX Linnaeus, Sp. Pl. 2: 1058. 1753.

人参属 ren shen shu

Herbs, perennial, with stout rootstock, hermaphroditic or perhaps andromonoecious, unarmed. Stem simple, with scales at base. Leaves palmately compound, in whorls of 3–5; leaflets entire to serrate or dentate or pinnately lobed. Inflorescence a solitary, terminal umbel. Pedicels articulate below bisexual flowers, inarticulate below male flowers. Calyx shortly 5-toothed. Petals 5, imbricate. Stamens 5. Ovary 2- or 3(–5)-carpellate; styles distinct or basally united, as many as carpels. Fruit a drupe, globose, sometimes slightly compressed or triangular. Seeds laterally compressed, as many as carpels; endosperm smooth.

About eight species: E Asia, Himalayan region, Indochina, North America; seven species (one introduced) in China.

We were unable to treat *Panax wangianus* S. C. Sun (Icon. Pl. Omei. 2(1): 194. 1946 [“*wangianum*”]; *P. pseudoginseng* Wallich var. *wangianus* (S. C. Sun) G. Hoo & C. J. Tseng), described from Sichuan, because we were unable to consult the type material.

- 1a. Rootstock usually horizontal, flagellate or moniliform; seeds ovoid, 3–5 × 2–4 mm 1. *P. japonicus*
- 1b. Rootstock fusiform or tuberous; seeds globose-nephroid or compressed-globose, 5–8 mm in diam.
 - 2a. Leaflets 2-pinnatifid, adaxially setose on veins; styles 2, usually united into a column; seeds subglobose 2. *P. stipuleanatus*
 - 2b. Leaflets not 2-pinnatifid; styles 2(or 3), divided at least apically.
 - 3a. Rootstock tuberous, resembling that of species of *Zingiber*; leaflets sessile or subsessile; seeds triangular-subglobose 3. *P. zingiberensis*
 - 3b. Rootstock fusiform; leaflets usually petiolulate; seeds ovoid-globose or laterally compressed.
 - 4a. Seeds ovoid-globose, slightly 3-ridged, not laterally compressed, thickness 5–6 mm; leaflets obovate or obovate-oblong; umbels 80–100(or more)-flowered; styles united at least to middle 4. *P. notoginseng*
 - 4b. Seeds laterally compressed, thickness 2–2.5 mm; leaflets elliptic or oblong, or if obovate then apically acuminate; umbels 20–50-flowered; styles 2, free to base.
 - 5a. Leaflets 1.5–2 mm, adaxially setose on veins, apically long caudate-acuminate; bases of petioles and of petiolules with numerous lanceolate, stipulelike appendages; pedicels longer, glabrous; rootstock fleshy, 2–5-fascicled 5. *P. pseudoginseng*
 - 5b. Leaflets ca. 1 mm, glabrous or adaxially sparsely setose, apically shortly acuminate, margin serrate; bases of petiole and petiolules without stipulelike appendages or with only hairlike appendages; pedicels rough; rootstock usually 1- or 2-fascicled.
 - 6a. Peduncle longer than petiole; leaflets sparsely minutely setose on veins, margin densely serrulate 6. *P. ginseng*
 - 6b. Peduncle not exceeding petiole; leaflets sparsely setose on veins or glabrous, margin coarsely serrate or dentate 7. *P. quinquefolius*

1. *Panax japonicus* (T. Nees) C. A. Meyer, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 1: 340. 1843.

竹节参 zhu jie shen

Herbs, 50–80(–100) cm tall. Rootstock horizontal, flagellate or moniliform. Stem straight, glabrous. Leaves 3–5, verticillate at apex of stem, palmately compound; petiole base without stipule or stipulelike appendages; leaflets 5, obovate-elliptic to narrowly elliptic, 5–18 × 2–6.5 cm, membranous, both surfaces sparsely setose on veins, base broadly cuneate to subrounded, margin serrulate or biserrate, apex acuminate or long acuminate. Inflorescence a solitary, terminal umbel 50–80(or more)-flowered; peduncle 12–21 cm, glabrous or slightly pubescent; pedicels 7–12 mm. Filaments shorter than petals. Ovary 2–5-carpellate; styles 2–5, united to middle. Fruit red, subglobose, 5–7 mm in diam.; seeds 2–5, white, triangular-ovoid, 3–5 × 2–4 mm. Fl. May–Jun, fr. Jul–Sep.

Forests, forests in valleys; 1200–3600 m. S Anhui, N Fujian, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [Bhutan, N India, Japan, Korea, Myanmar, Nepal, NE Thailand, Vietnam].

All four varieties are used medicinally.

- 1a. Rootstock flagellate, resembling rhizome of bamboo.
 - 2a. Leaflets obovate-elliptic to oblong, 2.5–3 × as long as wide, apex long acuminate 1a. var. *japonicus*
 - 2b. Leaflets narrowly lanceolate, ca. 5 × as long as wide, apex long caudate-acuminate 1b. var. *angustifolius*
- 1b. Rootstock moniliform or moniliform-mounded.
 - 3a. Rootstock moniliform; leaflets obovate-elliptic to elliptic, not pinnatifid 1c. var. *major*
 - 3b. Rootstock moniliform-mounded, rarely like knot of bamboo; leaflets 2-pinnatifid 1d. var. *bipinnatifidus*

1a. *Panax japonicus* var. *japonicus*

竹节参(原变种) zhu jie shen (yuan bian zhong)

Panax schin-seng T. Nees var. *japonicus* T. Nees, Pl. Medecin. Suppl. [under *Panax schin-seng*]. 1833; *Aralia quinquefolia* (Linnaeus) Decaisne & Planchon var. *repens* (Maximowicz) Burkill; *P. pseudoginseng* Wallich subsp. *japonicus* (T. Nees) H. Hara; *P. pseudoginseng* var. *japonicus* (T. Nees) G. Hoo & C. J. Tseng; *P. repens* Maximowicz.

Rootstock flagellate, like rhizome of bamboo. Leaflets not 2-pinnatifid, obovate-elliptic to oblong, 2.5–3 × as long as wide, apex long acuminate. Fl. May–Jun, fr. Jul–Sep.

Forests; 1200–3600 m. S Anhui, N Fujian, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang [Japan, Korea, Vietnam].

“*Panax quinquefolius* var. *japonicus*” (Siebold, Verh. Batav. Genootsch. Kunsten 12: 45. 1830) belongs here but is a nomen nudum.

1b. *Panax japonicus* var. *angustifolius* (Burkill) C. C. Cheng & Chu, Acta Pharm. Sin. 9: 538. 1962.

狭叶竹节参 xia ye zhu jie shen

Aralia quinquefolia var. *angustifolia* Burkill, Bull. Misc. Inform. Kew 1902: 7. 1902; *P. pseudoginseng* var. *angustifolius* (Burkill) H. L. Li.

Rootstock flagellate. Leaflets not 2-pinnatifid, narrowly lanceolate, ca. 5 × as long as wide, apex long caudate-acuminate.

Forests; 1600–3600 m. Guizhou, Sichuan, Yunnan [Bhutan, NE India, Nepal, NE Thailand].

1c. *Panax japonicus* var. *major* (Burkill) C. Y. Wu & K. M. Feng, Acta Phytotax. Sin. 13(2): 43. 1975.

珠子参 zhu zi shen

Aralia quinquefolia var. *major* Burkill, Bull. Misc. Inform. Kew 1902: 7. 1902; *Panax major* (Burkill) K. C. Ting ex C. Pei & Y. L. Chou; *P. pseudoginseng* var. *major* (Burkill) H. L. Li.

Rootstock moniliform. Leaflets not 2-pinnatifid, obovate-elliptic to elliptic, apex acuminate, rarely long acuminate.

Forests; 1700–3600 m. Gansu, Guizhou, Henan, Hubei, Shanxi, Sichuan, Xizang, Yunnan [N Myanmar, Nepal, N Vietnam].

1d. *Panax japonicus* var. *bipinnatifidus* (Seemann) C. Y. Wu & K. M. Feng, Acta Phytotax. Sin. 13(2): 43. 1975.

疙瘩七 ge da qi

Panax bipinnatifidus Seemann, J. Bot. 6: 54. 1868; *Aralia bipinnatifida* (Seemann) C. B. Clarke; *A. quinquefolia* var. *elegantior* Burkill; *P. pseudoginseng* var. *bipinnatifidus* (Seemann) H. L. Li; *P. pseudoginseng* var. *elegantior* (Burkill) G. Hoo & C. J. Tseng.

Rootstock moniliform-mounded, rarely like knot of bamboo. Leaflets 2-pinnatifid.

Forests in valleys; 1800–3400 m. Gansu, Hubei, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, N India, Myanmar, Nepal].

2. *Panax stipuleanatus* C. T. Tsai & K. M. Feng, Acta Phytotax. Sin. 13(2): 44. 1975.

屏边三七 ping bian san qi

Herbs, perennial, 45–55 cm tall. Rootstock fusiform. Leaves 3, verticillate at apex of stem, palmately compound; petiole base without stipule or stipulelike appendages; leaflets 5(–7), 2-pinnatifid, 6–12 × 2.5–6 cm, membranous, adaxially setose on veins, base broadly cuneate or subrounded, margin serrate, setose, apex caudate-acuminate. Inflorescence a solitary, terminal umbel 50–80-flowered; peduncle 8–10 cm, glabrous. Filaments ca. as long as petals or slightly longer. Ovary 2-carpellate; styles 2, usually united into a column. Fruit red, subglobose or globose-nephroid, ca. 8 mm in diam.; seeds 2, subglobose. Fl. May–Jun, fr. Jul–Aug.

Forests in valleys; 1100–1700 m. SE Yunnan [N Vietnam].

This species is used medicinally.

3. *Panax zingiberensis* C. Y. Wu & K. M. Feng, Acta Phytotax. Sin. 13(2): 42. 1975.

姜状三七 jiang zhuang san qi

Herbs, perennial, 20–60 cm tall. Rootstock fleshy, horizontal, resembling that of species of *Zingiber*. Leaves 3–7, verticillate at apex of stem, palmately compound; petiole base without stipule or stipulelike appendages; leaflets 3–5, sessile or subsessile, elliptic to obovate-oblong, 6–18 × 3–6 cm, membranous, both surfaces setose on veins, base cuneate, margin serrate or slightly biserrate, setose, apex acuminate to long acuminate. Inflorescence a solitary, terminal umbel; peduncle 24–26 cm, pubescent. Filaments longer than petals. Ovary 2-carpellate; styles 2, united to middle. Fruit red, globose-nephroid; seeds 2, triangular-subglobose. Fl. Jul–Aug, fr. Aug–Oct.

Broad-leaved evergreen forests. SE Yunnan [N Vietnam].

This species is used medicinally.

4. *Panax notoginseng* (Burkill) F. H. Chen ex C. Chow & W. G. Huang, Acta Phytotax. Sin. 13(2): 41. 1975.

三七 san qi

Aralia quinquefolia (Linnaeus) Decaisne & Planchon var. *notoginseng* Burkill, Bull. Misc. Inform. Kew 1902: 7. 1902; *Panax pseudoginseng* Wallich var. *notoginseng* (Burkill) G. Hoo & C. J. Tseng.

Herbs, perennial, 20–60 cm tall. Rootstock fleshy, roots 1 to numerous, fusiform. Leaves 3–6, verticillate at apex of stem, palmately compound; petiole base without stipule or stipulelike appendages; leaflets obovate or obovate-oblong, 3.5–13 × 1.5–7 cm, membranous, both surfaces sparsely setose on veins, base oblique, margin biserrate, setose, apex acuminate or long acuminate. Inflorescence a solitary, terminal umbel 80–100 (or more)-flowered; peduncle 7–25 cm, glabrous or sparsely pubescent; pedicels 1–2 cm, slender, slightly pubescent. Filaments ca. as long as petals. Ovary 2-carpellate; styles 2, united at least to middle, divergent in fruit. Fruit red, compressed globose-nephroid, ca. 1 cm in diam.; seeds 2, triangular-ovoid, slightly 3-ridged, thickness 5–6 mm. Fl. Jul–Aug, fr. Aug–Oct. $2n = 24$.

Forests; 1200–1800 m. SE Yunnan; cultivated in Fujian, SW Guangxi, Jiangxi, Zhejiang [N Vietnam].

This species is used medicinally.

5. *Panax pseudoginseng* Wallich, Trans. Med. Soc. Calcutta 4: 117. 1829 [*“pseudo-ginseng”*].

假人参 jia ren shen

Aralia pseudoginseng (Wallich) Bentham ex C. B. Clarke; *A. quinquefolia* (Linnaeus) Decaisne & Planchon var. *pseudoginseng* (Wallich) Burkill.

Herbs, perennial, ca. 50 cm tall. Rootstock short, with 2–5 fleshy roots, fusiform, 2–4 cm, ca. 1 cm in diam. Leaves usually 4, verticillate at apex of stem, palmately compound; bases of petiole and petiolules with numerous lanceolate, stipulelike appendages; leaflets 3 or 4, obovate-elliptic to obovate-oblong, 9–10 × 3.5–4 cm (lateral ones smaller), membranous, abaxially glabrous, adaxially setose on veins (trichomes 1.5–2 mm), base attenuate, margin biserrate, apex long caudate-acuminate. Inflorescence a solitary, terminal umbel 20–50-flowered; peduncle ca. 12 cm; pedicels ca. 1 cm, glabrous. Ovary 2-carpellate; styles 2 divided, reflexed.

Forests; 2400–4200 m. S Xizang [?Bhutan, ?N India, Nepal].

This species is used medicinally.

6. *Panax ginseng* C. A. Meyer, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 1: 340. 1843.

人参 ren shen

Aralia ginseng (C. A. Meyer) Baillon; *A. quinquefolia* (Linnaeus) Decaisne & Planchon var. *ginseng* (C. A. Meyer) Anon-

ymous; *Panax quinquefolius* Linnaeus var. *ginseng* (C. A. Meyer) Regel & Maack; *P. schin-seng* T. Nees.

Herbs, perennial, 30–60 cm tall. Rootstock usually with 1- or 2-fascicled roots, fusiform or cylindrical. Leaves 3–6, verticillate at apex of stem, palmately compound; petiole base without stipule or stipulelike appendages; leaflets 3–5, membranous, abaxially glabrous, adaxially sparsely setose (trichomes ca. 1 mm), base broadly cuneate, margin densely serrulate, apex long acuminate; central leaflet elliptic to oblong-elliptic, 8–12 × 3–5 cm; lateral leaflets ovate to rhombic-ovate, 2–4 × 1.5–3 cm. Inflorescence a solitary, terminal umbel 30–50-flowered; peduncle 15–30 cm, usually longer than petiole; pedicels 0.8–1.5 cm. Ovary 2-carpellate; styles 2, distinct. Fruit red, compressed-globose, 4–5 × 6–7 mm; seeds nephroid, white. $2n = 48^*$.

Mixed forests, deciduous broad-leaved forests. E Heilongjiang, E Jilin, E Liaoning; recently cultivated in Hebei and Shanxi [Korea, E Russia].

This species is used medicinally.

7. *Panax quinquefolius* Linnaeus, Sp. Pl. 2: 1058. 1753 [*“quinquefolium”*].

西洋参 xi yang shen

Aralia quinquefolia (Linnaeus) Decaisne & Planchon.

Herbs, perennial, 20–50 cm tall. Rootstock spindle-shaped. Leaves palmately compound; bases of petiole and petiolules with numerous lanceolate, stipulelike appendages; leaflets oblong-obovate, 8–14 × (2–)2.5–8 cm, membranous, sparsely setose on veins or glabrous adaxially, margin coarsely serrate or dentate, apex abruptly or boldly acuminate. Inflorescence a solitary, terminal umbel 6–20-flowered; peduncle not exceeding petioles. Ovary 2-carpellate; styles 2. Fruit bright red, ca. 1.2 cm in diam. $2n = 48^*$.

Recently widely cultivated. Guizhou, Heilongjiang, Jiangsu, Jiangxi, Jilin, Liaoning [native to Canada and the United States].

This species is used medicinally.