

8. PHYSALIASTRUM Makino, Bot. Mag. (Tokyo) 28: 20. 1914.

散血丹属 san xue dan shu

Archiphysalis Kuang.

Shrubs or perennial or perhaps annual herbs; pubescence of simple hairs. Stems dichotomously branched. Leaves simple, petiolate. Inflorescences in branch forks, occasionally axillary, solitary or sometimes 2- or 3-flowered clusters; peduncle short or obsolete. Flowers mostly actinomorphic, 5-merous, long pedicellate, nodding. Calyx short campanulate or conical, lobed to halfway, lobes equal or not. Corolla broadly campanulate to rotate, lobed to halfway; lobes wide spreading, densely villous near base of tube, sometimes spotted. Nectaries sometimes present. Stamens inserted in corolla tube; filaments pubescent or glabrous; anthers dehiscing longitudinally. Disc rudimentary or absent. Ovary 2-locular; ovules numerous. Fruiting calyx becoming enlarged, applied to berry or inflated, mostly open at apex; veins obscure or thickened into angles or ribs, mostly muricate or bristly with soft emergences that appear deltate and scalelike when dry, these sometimes localized on angles. Fruit a juicy or fleshy berry enveloped in calyx. Seeds numerous, reniform-discoïd, minutely pitted; embryo curved, subperipheral.

About nine species: Asia, seven species in China.

The genus *Archiphysalis*, which was recognized in FRPS, was placed into synonymy under *Physaliastrum* by D'Arcy & Zhang, Novon 2: 124–128. 1992. Many species were formerly known as *Chamaesaracha* A. Gray and *Leucophysalis* Rydberg, but these genera now include only New World taxa.

- 1a. Veins of fruiting calyx thickened into ribs or angles, these sometimes with dentate emergences, area between veins smooth.
 - 2a. Fruiting calyx with evenly thickened ribs or angles, especially basally, lacking emergences 6. *P. sinense*
 - 2b. Fruiting calyx with unevenly thickened, winglike ribs, these with teeth or emergences that dry deltate 7. *P. chamaesarachoides*
- 1b. Veins of fruiting calyx obscure, evenly muricate with bristly emergences that dry deltate and scalelike.
 - 3a. Corolla with an evident nectary; fruiting calyx about as long as berry, apex open 5. *P. echinatum*
 - 3b. Corolla without a nectary; fruiting calyx longer than berry, apex slightly contracted.
 - 4a. Flowering calyx 5-dentate, lobes equal, broadly deltate 1. *P. yunnanense*
 - 4b. Flowering calyx 5-divided halfway, lobes unequal, narrowly deltate or oblong.
 - 5a. Corolla 1×1 cm; stamens more than half as long as corolla, filaments glabrous 4. *P. sinicum*
 - 5b. Corolla 1.5–2×1.5–2 cm; stamens half as long as corolla, filaments glabrous or pubescent.
 - 6a. Calyx lobes subequal; filaments sparsely pubescent 2. *P. heterophyllum*
 - 6b. Calyx lobes very unequal, longest 1 as long as corolla; filaments glabrous 3. *P. kweichouense*

1. *Physaliastrum yunnanense* Kuang & A. M. Lu, Acta Phytotax. Sin. 10: 348. 1965.

云南散血丹 yun nan san xue dan

Plants 60–100 cm tall. Roots stout, ca. 2.5 cm in diam. Stems erect, woody at base, mostly unbranched. Petiole 1–3 cm; leaf blade elliptic, 5–15×2–8 cm, base obtuse or cuneate, sometimes oblique, apex acute or short acuminate; veins arcuate ascending, sparsely pubescent with minute hairs, glabrescent. Inflorescences solitary or paired flowers. Pedicel 1–2.5 cm. Calyx tubular, short campanulate, 1/4 to 1/3 as long as corolla, ca. 4×6 mm, 5-dentate; lobes erect, equal, deltate, densely villous abaxially, ciliate. Corolla white, campanulate, 1–1.7×1–1.7 cm; lobes deltate, 5–7 mm, pubescent abaxially. Stamens ca. 6 mm; filaments ca. 4 mm, glabrous; anthers 1.8–2 mm. Ovary conical. Fruiting pedicel 3–5 cm, glabrous. Fruiting calyx ovoid-globose, slightly exceeding berry, closely and entirely enveloping it, sometimes slightly open at apex; lobes very short, persistent. Berry globose, ca. 1.5×1.7 cm. Seeds ca. 3×2.5 mm. Fl. May–Jun, fr. Jul–Aug.

• Forests; 1800–2600 m. Yunnan (Fengqing Xian, Yangbi Xian).

2. *Physaliastrum heterophyllum* (Hemsley) Migo, J. Shanghai Sci. Inst. Sect. 3, 4: 171. 1939.

江南散血丹 jiang nan san xue dan

Chamaesaracha heterophylla Hemsley, J. Linn. Soc., Bot. 26: 174. 1890; *Leucophysalis heterophylla* (Hemsley) Averett.

Plants 30–60 cm tall. Roots numerous, clustered, fleshy and fibrous often together. Stems erect. Petiole 2–4 cm; leaf blade elliptic, ovate, or lanceolate, 7–19×3–9 cm, sparsely pubescent, base oblique, apex short acuminate or acute. Pedicel 1–2.2 cm, glabrescent. Calyx short campanulate, 1/3 as long as corolla, 5–11×6–10 mm, divided to halfway or slightly 5-parted; lobes erect, narrowly deltate or lanceolate, acuminate at apex, ± less unequal, pubescent and villous abaxially, ciliate. Corolla white, pale yellow, or yellowish green, broadly campanulate, 1.2–2×1.5–2.8 cm; lobes short deltate, pubescent abaxially, ciliate. Nectary absent. Stamens half as long as corolla; filaments 4–5 mm, sparsely pubescent; anthers 2–3 mm. Fruiting pedicel 2–3.5 cm, thickened upwards. Fruiting calyx subglobose, closely enveloping and longer than berry, 2–2.5×3–5 cm, base rounded, apex abruptly contracted, open. Berry 1.5–2 cm. Fl. May–Aug, fr. Jul–Sep.

• Slopes, humid places in forests; 500–1100 m. Anhui, Fujian, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Yunnan, Zhejiang.

3. *Physaliastrum kweichouense* Kuang & A. M. Lu, Acta Phytotax. Sin. 10: 351. 1965.

散血丹 san xue dan

Plants ca. 33 cm tall. Roots numerous, fleshy, clustered. Stems slender, pubescent. Petiole 0.5–2.5 cm; leaf blade ovate to elliptic, 6–10×3–6 cm, pubescent adaxially and along veins abaxially, base oblique, decurrent, margin entire, apex acute or acuminate. Pedicel 1–1.5 cm, pubescent, nodding. Calyx campanulate, 1–1.3 cm, tube ca. 6×7 mm, divided nearly halfway; lobes unequal, 4–9 mm, longest broadly linear, equalling corolla, shortest narrowly deltate, ciliate. Corolla campanulate, ca. 2×2 cm; lobes short deltate, ciliate. Stamens 6–7 mm; filaments 5–6 mm, glabrous; anthers ca. 2 mm. Stigma 2-lobed. Fruit unknown. Fl. May-Jul.

• Ditches; 800 m. Guizhou (Kaili Xian), Hubei (Xuanen Xian), Hunan (Sangzhi Xian).

4. *Physaliastrum sinicum* Kuang & A. M. Lu, *Acta Phytotax. Sin.* 10: 352. 1965.

华北散血丹 hua bei san xue dan

Plants 30–50 cm tall. Roots numerous, clustered. Stems pubescent, glabrescent. Petiole 0.5–2.5 cm; leaf blade usually broadly ovate, 5–13×4–7 cm, pubescent, base cuneate, apex acute. Inflorescences usually paired flowers in leaf axils, branch forks, or branch axils. Pedicel 1–1.5 cm, densely pubescent, nodding. Calyx short campanulate, half as long as corolla, ca. 7×7 mm, divided halfway; lobes erect, unequal, longest oblong, shorter ones narrowly deltate or lanceolate, ciliate. Corolla white, campanulate, ca. 1×1 cm; lobes broadly deltate, ciliate. Stamens more than half corolla length; filaments ca. 4 mm, glabrous; anthers ca. 2 mm. Fruiting pedicel 2–2.5 cm. Fruiting calyx ovoid-globose, ca. 2.5×1.8 cm, enveloping and longer than berry, open at apex; lobes 0.7–1.4 cm. Berry globose, ca. 1.6 cm in diam. Seeds subdiscoïd. Fl. May-Jun, fr. Jul-Aug.

• Slopes, thickets in valleys; 1200–1400 m. Hebei (Neiqiu Xian), Shanxi (Lingchuan Xian).

5. *Physaliastrum echinatum* (Yatabe) Makino, *Bot. Mag. (Tokyo)* 28: 21. 1914.

日本散血丹 ri ben san xue dan

Chamaesaracha echinata Yatabe, *Bot. Mag. (Tokyo)* 5: 355. 1891.

Plants 50–70 cm tall, sparsely pubescent or villous. Petiole 0.5–2.5 cm; leaf blade ovate to broadly ovate, 4–12×3–6 cm, pubescent, ciliate, base cuneate, decurrent, apex acute. Inflorescences usually 2- or 3-flowered clusters in leaf axils or branch forks. Pedicel 2–4 cm, nodding. Calyx short campanulate, 3–5 mm in diam., pubescent and villous with scalelike abaxial emergences; lobes short deltate, equal, 0.5–1.5 mm. Corolla campanulate, ca. 1 cm in diam.; lobes pubescent, ciliate, with 5 pairs of nectaries adaxially near middle part of tube. Stamens included, slightly shorter than corolla tube; filaments pubescent, ca. 6 mm; anthers 1.8–2 mm. Fruiting calyx subglobose, nearly as long as berry, open at apex, thick, muricate. Berry globose, ca. 1 cm in diam., enveloped in fruiting calyx, only apex exposed. Seeds subdiscoïd. Fl. Jun-Aug, fr. Jul-Sep.

Grassy slopes, forests; low elevations. Hebei, Heilongjiang, Jilin, Liaoning, Shandong, Zhejiang [Japan, Korea, Russia].

This species was treated in FRPS as *Physaliastrum japonicum* (Franchet & Savatier) Honda, which is a different species.

6. *Physaliastrum sinense* (Hemsley) D'Arcy & Z. Y. Zhang, *Novon* 2: 127. 1992.

地海椒 di hai jiao

Chamaesaracha sinensis Hemsley, *J. Linn. Soc., Bot.* 26: 174. 1890; *Archiphysalis sinensis* (Hemsley) Kuang; *Physalis sinensis* (Hemsley) Averett.

Herbs perennial, 1–2 m tall, glabrous. Petiole 0.5–2.5 cm; leaf blade ovate or ovate-lanceolate, 3–7×2–4 cm, sometimes with scattered pubescence adaxially, glabrous abaxially, sometimes ciliate, base obtuse or acuminate, sometimes oblique, margin entire, sinuate, or with a few teeth, apex acuminate. Flowers in clusters of 2 or 3; pedicel 2–2.5 cm. Calyx ca. 4×3 mm; teeth short deltate, apex obtuse, ciliate. Corolla white, with green spots at throat, ca. 1□×1 cm, divided to halfway; lobes narrowly ovate, densely pubescent adaxially, ciliate. Stamens ca. 8 mm. Ovary ca. 2 mm. Fruiting calyx oblate, 1.5×1.8–2 cm, faintly 10-angular, 10-ribbed, contracted and open at apex. Berry yellow-green. Seeds pale yellow. Fl. Jun-Aug, fr. Sep-Oct.

• Forests, slopes; 300–1400 m. Anhui (Qimen Xian), Guizhou (Dejiang, Yongjiang Xians), W Hubei, E and W Sichuan.

7. *Physaliastrum chamaesarachoides* (Makino) Makino, *J. Jap. Bot.* 5: 24. 1928.

广西地海椒 guang xi di hai jiao

Physalis chamaesarachoides Makino, *Bot. Mag. (Tokyo)* 22: 34. 1908; *Archiphysalis chamaesarachoides* (Makino) Kuang; *A. kwangsiensis* Kuang; *P. linii* Y. C. Liu & C. H. Ou.

Shrubs or herbs, erect, large, perhaps annual, sparsely pubescent, glabrescent. Stems and branches thick, much reflexed. Petiole 1–3 cm; leaf blade ovate or broadly elliptic, 3–14×2–6 cm, glabrescent, base rounded or broadly cuneate, decurrent, sometimes oblique, margin with a few coarse teeth, rarely entire, apex short acuminate. Pedicel 5–10 mm. Calyx broadly campanulate, 2–3 mm, basally rounded; lobes deltate, ca. 0.5 mm, ciliate, abaxially spiny. Corolla white, with 5 2-part markings abaxially, campanulate-rotate; lobes ovate, slightly longer than tube, 2–3 mm, spreading, ciliolate. Stamens inserted in tube, erect, included or slightly exerted, 6–7 mm; filaments 5–6 mm; anther ovoid, ca. 1 mm. Ovary ovoid, glabrous. Style erect, as long as stamens. Fruiting pedicel 1.5–1.8 cm, nodding; fruiting calyx much inflated, globose-ovoid, ca. 1.8×1.5 cm, with longitudinal winglike ribs and prominent deltate teeth on ribs. Berry globose, much smaller than fruiting calyx, 8–12×8–10 mm. Seeds pale yellow, discoïd, ca. 1 mm in diam. Fl. Jul-Sep, fr. Aug-Nov.

Forests; 300–1000 m. Anhui (Qimen Xian, Yi Xian), Fujian (Dehua Xian), Guangxi (He Xian), Guizhou (Jiangkou Xian), Jiangxi (Dexing Xian), Taiwan [Japan].

