

45. SANGUISORBA Linnaeus, Sp. Pl. 1: 116. 1753.

地榆属 di yu shu

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Poterium Linnaeus.

Herbs perennial. Rootstock robust, bearing many fusiform, cylindric roots in lower part. Stipules sheathing, adnate to petiole, petiole sheathing and imbricate at base; leaf blade imparipinnate; leaflets serrate at margin. Inflorescences terminal on elongate scapes, densely capitate or spicate, bracteate and bracteolate. Flowers bisexual, rarely unisexual (when plants monoecious). Hypanthium with a constricted throat. Sepals 4(–7), imbricate, petaloid, purple, red, pink, or white, rarely greenish. Petals absent. Disk lining hypanthium. Stamens usually 4, rarely more, inserted in throat of hypanthium; filaments free, rarely partly connate; anthers didymous. Carpel 1(or 2), included in hypanthium; ovule pendulous; style terminal, filiform; stigma penicillate. Achene dry, included in hardened, muricate or winged hypanthium. Cotyledons planoconvex. x = 7.

About 30 species: Asia, Europe, North America; seven species (one endemic) in China.

- 1a. Inflorescences flowering from base upward.
 - 2a. Leaflets of radical leaves usually truncate to subcordate at base; inflorescences usually nodding, thick; sepals white or pinkish; bracts longer than hypanthium in bud, densely hairy; filaments gradually dilated from base, broadest near middle, then gradually attenuate toward apex, narrower than anther, or sometimes little dilated 6. *S. alpina*
 - 2b. Leaflets of radical leaves cordate or deeply so at base; inflorescences usually erect, long, slender; sepals white; bracts nearly equaling hypanthium in bud, abaxially sparsely hairy or subglabrous, margin ciliate; filaments compressed-dilated from middle to apex, broadest at apex, nearly as broad as anther 7. *S. stipulata*
- 1b. Inflorescences flowering from apex downward.
 - 3a. Inflorescences capitate; sepals white.
 - 4a. Plants less than 35 cm tall; leaflets of radical leaves broadly ovate to suborbicular; flowers unisexual (females in center, males surrounding); style 0.5–1 × as long as sepals; fruiting hypanthium with 4 ribs 4. *S. filiformis*
 - 4b. Plants to 85 cm tall; leaflets of radical leaves ovate, elliptic, or long elliptic; flowers bisexual; style equaling sepals; fruiting hypanthium with 4 winged ribs 5. *S. diandra*
 - 3b. Inflorescences ellipsoid, cylindric, or elongate; sepals purple, red, pink, or white.
 - 5a. Filaments filiform, subequaling sepals 1. *S. officinalis*
 - 5b. Filaments compressed-dilated, 0.5–2 × as long as sepals.
 - 6a. Leaflets of radical leaves linear-lanceolate, base subcordate or rounded to obliquely broadly cuneate, margin acutely incised serrate 2. *S. tenuifolia*
 - 6b. Leaflets of radical leaves ovate, elliptic, or oblong, base cordate, margin coarsely obtusely serrate 3. *S. applanata*

1. *Sanguisorba officinalis* Linnaeus, Sp. Pl. 1: 116. 1753.

地榆 di yu

Herbs perennial, 30–120 cm tall. Rootstock brown or purple-brown, robust, usually fusiform, rarely terete, cross section yellow-white or purple. Stems erect, angular, glabrous, or base pilose or sparsely glandular hairy. Radical leaves: stipules brown, membranous, glabrous or abaxially sparsely glandular hairy; petiole long, glabrous or sparsely glandular, base sheathing and imbricate, sometimes sparsely glandular hairy; leaf blade with 4–6 pairs of leaflets; leaflets petiolulate, green on both surfaces, ovate, oblong-ovate, fasciated oblong, or fasciated lanceolate, 1–7 × 0.5–3 cm, base cordate to broadly cuneate, margin coarsely obtusely or rarely acutely serrate, both surfaces glabrous or abaxially sparsely pilose; cauline leaves: stipules large, semiovate, herbaceous, margin acutely serrate; leaflets shortly petiolulate or sessile, oblong to oblong-lanceolate, base subcordate to rounded, apex acute. Inflorescences erect, spicate, ellipsoid, cylindric, or ovoid, usually 1–6 × 0.5–1 cm, flowering from apex to base; rachis glabrous or occasionally sparsely glandular hairy; bracts lanceolate, shorter than or nearly equaling sepals, membranous, abaxially pilose, apex acu-

minate to caudate. Sepals 4, purple, red, pink, or white, elliptic to broadly ovate, abaxially pilose, with faint longitudinal midvein, usually with shortly acute apex. Stamens 4; filaments filiform, 0.5–1 × as long as sepals, exerted beyond them or not. Ovary glabrous or puberulous; stigma dilated, discoid, margin fimbriate-papillate. Fruiting hypanthium longitudinally 4-ribbed. Fl. and fr. Jul–Nov.

Thinned forests, forest margins, thickets, meadows, grasslands, grassy mountain slopes, damp places in ravines, stream banks; near sea level to 3000 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Asia, Europe].

This species is used medicinally.

- 1a. Filaments 0.5–1 × as long as sepals, exerted beyond them 1e. var. *longifila*
- 1b. Filaments nearly equaling sepals.
 - 2a. Leaflets of radical leaves fasciated oblong to fasciated lanceolate, base subcordate or rounded to broadly cuneate 1d. var. *longifolia*

- 2b. Leaflets of radical leaves ovate or oblong-ovate, base cordate to subcordate.
- 3a. Sepals pink or white 1c. var. *carnea*
- 3b. Sepals purple, red, or tinged purple.
 - 4a. Leaflets glabrous on both surfaces, base of petiole or stem sometimes sparsely glandular hairy 1a. var. *officinalis*
 - 4b. Leaflets abaxially sparsely pilose, base of petiole or stem sparsely glandular hairy 1b. var. *glandulosa*

1a. *Sanguisorba officinalis* var. *officinalis*

地榆(原变种) di yu (yuan bian zhong)

Poterium officinale (Linnaeus) A. Gray; *Sanguisorba montana* Jordan; *S. officinalis* var. *longa* Kitagawa; *S. officinalis* var. *montana* (Jordan) Focke; *S. officinalis* var. *microcephala* Kitagawa; *S. officinalis* var. *polygama* (Nylander) Sergievskaja; *S. polygama* Nylander.

Base of petiole or stem sometimes sparsely glandular hairy; leaflets of radical leaves ovate or oblong-ovate, glabrous on both surfaces, base cordate to subcordate. Sepals purple, red, or tinged purple. Filaments nearly equaling sepals. Fl. and fr. Jul–Oct.

Thinned forests, thickets, meadows, grasslands, grassy mountain slopes; near sea level to 3000 m. Anhui, Gansu, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang [Asia, Europe].

1b. *Sanguisorba officinalis* var. *glandulosa* (Komarov) Vorschilov, Fl. Far East URSS 265. 1966.

腺地榆 xian di yu

Sanguisorba glandulosa Komarov, Bot. Mater. Gerb. Glavn. Bot. Sada SSSR 6: 10. 1926.

Base of petiole or stem sparsely glandular hairy; leaflets of radical leaves ovate or oblong-ovate, abaxially sparsely pilose, base cordate to subcordate. Sepals purple, red, or tinged purple. Filaments nearly equaling sepals. Fl. and fr. Jul–Sep.

Forest margins, damp places in ravines; 600–1900 m. Gansu, Heilongjiang, Shaanxi [Mongolia, E Russia].

1c. *Sanguisorba officinalis* var. *carnea* (Fischer ex Link) Regel ex Maximowicz, Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Pétersbourg 9: 154. 1877.

粉花地榆 fen hua di yu

Sanguisorba carnea Fischer ex Link, Enum. Hort. Berol. Alt. 1: 144. 1821.

Leaflets of radical leaves ovate or oblong-ovate, base cordate to subcordate. Sepals pink or white. Filaments nearly equaling sepals.

Heilongjiang, Jilin [Korea].

1d. *Sanguisorba officinalis* var. *longifolia* (Bertoloni) T. T. Yu & C. L. Li, Acta Phytotax. Sin. 17(1): 9. 1979.

长叶地榆 chang ye di yu

Sanguisorba longifolia Bertoloni, Mem. Reale Accad. Sci. Ist. Bologna 12: 234. 1861; *Poterium longifolium* (Bertoloni) J. D. Hooker; *S. formosana* Hayata; *S. officinalis* subsp. *longifolia* (Bertoloni) K. M. Purohit & Panigrahi; *S. rectispicata* Kitagawa.

Leaflets of radical leaves fasciated oblong to fasciated lanceolate, base subcordate or rounded to broadly cuneate. Filaments nearly equaling sepals. Fl. and fr. Aug–Nov.

Thinned forests, thickets, damp meadows, grassy mountain slopes, stream banks; 100–3000 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Korea, Mongolia, Russia].

1e. *Sanguisorba officinalis* var. *longifila* (Kitagawa) T. T. Yu & C. L. Li, Acta Phytotax. Sin. 17(1): 10. 1979.

长蕊地榆 chang rui di yu

Sanguisorba rectispicata var. *longifila* Kitagawa, Bot. Mag. (Tokyo) 50: 136. 1936; *S. longifolia* var. *longifila* (Kitagawa) Kitagawa.

Leaflets of radical leaves fasciated oblong to fasciated lanceolate. Filaments 0.5–1 × as long as sepals, exerted beyond them. Fl. and fr. Aug–Sep.

• Damp meadows, ditch banks; 100–1300 m. Heilongjiang, Nei Mongol.

2. *Sanguisorba tenuifolia* Fischer ex Link, Enum. Hort. Berol. Alt. 1: 144. 1821.

细叶地榆 xi ye di yu

Herbs perennial, to 1.5 m tall. Rootstock branched, robust, with many long, slender roots. Stems angular, glabrous. Radical leaves: stipules brown, membranous, abaxially glabrous; petiole glabrous; leaf blade with 7–9 pairs of leaflets; leaflets petiolulate, green on both surfaces, fasciated or fasciated lanceolate, 5–7 × 1.5–1.7 cm, both surfaces glabrous, base subcordate to obliquely truncate or rounded, margin acutely incised serrate, apex rounded to acute; cauline leaves: stipules green, falcate, herbaceous, margin incised serrate; leaf blade resembling that of radical leaves but leaflets fewer and narrower higher up stem. Inflorescences usually nodding, spicate, long cylindrical, 2–7 × 0.5–0.8 cm; peduncle subglabrous; bracts lanceolate, shorter than sepals, abaxially and at margin densely hairy. Sepals red, whitish red, or white, long elliptic, abaxially glabrous. Stamens 4; filaments compressed-dilated, 0.5–2 × as long as sepals, apex narrower than or nearly as broad as anther. Ovary glabrous or pubescent near base; stigma dilated, discoidal. Fruiting hypanthium longitudinally 4-ribbed, glabrous. Fl. and fr. Jul–Sep.

Forests, forest margins, meadows, grassy mountain slopes, damp places; 200–1700 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia].

- 1a. Sepals red, sometimes whitish red; filaments 0.5–1 × as long as sepals 2a. var. *tenuifolia*
- 1b. Sepals white; filaments 1–2 × as long as sepals 2b. var. *alba*

2a. *Sanguisorba tenuifolia* var. *tenuifolia*

细叶地榆(原变种) xi ye di yu (yuan bian zhong)

Sanguisorba tenuifolia var. *purpurea* Trautvetter & C. A. Meyer; *S. affinis* C. A. Meyer ex Regel & Tiling; *Poterium tenuifolium* (Fischer ex Link) Franchet & Savatier.

Sepals red, sometimes whitish red. Filaments 0.5–1 × as long as sepals. Fl. and fr. Aug–Sep.

Forest margins, meadows, grassy mountain slopes; 300–1500 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia].

2b. *Sanguisorba tenuifolia* var. *alba* Trautvetter & C. A. Meyer in Middendorff, Reise Sibir. 1(3): 35. 1856.

小白花地榆 xiao bai hua di yu

Sanguisorba parviflora (Maximowicz) Takeda; *S. tenuifolia* var. *parviflora* Maximowicz.

Sepals white. Filaments 1–2 × as long as sepals. Fl. and fr. Jul–Sep.

Forests, forest margins, meadows, damp places; 200–1700 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia].

3. *Sanguisorba applanata* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 17(1): 11. 1979.

宽蕊地榆 kuan rui di yu

Herbs perennial, 75–120 cm tall. Rootstock robust, terete. Stems subglabrous. Lower cauline leaves: stipules semiorbicular, margin incised serrate; petiole sparsely pilose; leaf blade with 3–5 pairs of leaflets; petiolules 0.5–2.5 cm; leaflets green on both surfaces, ovate, elliptic, or oblong, 1.5–5 × 1–4 cm, both surfaces glabrous or abaxially densely villous, base cordate, margin coarsely dentate, apex rounded, rarely truncate; upper cauline leaves: leaflets narrowly oblong, base truncate to broadly cuneate. Inflorescences spicate, long cylindric, 4–7.5 × 0.6–1 cm; bracts elliptic-ovate, abaxially pubescent. Sepals pale pink or white, elliptic. Stamens 4; filaments gradually compressed-dilated distally, ca. 2 × as long as sepals, as broad as anther. Style filiform; stigma dilated, discoidal, papillate. Fl. and fr. Jul–Oct.

• Thinned forests, marshy banks of ravines and streams; 100–500 m. Hebei, Jiangsu, Shandong.

- 1a. Stipules and leaflets glabrous on both surfaces; sepals pale pink or white 3a. var. *applanata*
- 1b. Stipules and leaflets abaxially densely villous; sepals pale pink 3b. var. *villosa*

3a. *Sanguisorba applanata* var. *applanata*

宽蕊地榆(原变种) kuan rui di yu (yuan bian zhong)

Stipules and leaflets glabrous on both surfaces. Sepals pale pink or white. Fl. and fr. Jul–Oct.

• Thinned forests, marshy banks of ravines and streams; 100–500 m. Hebei, Jiangsu, Shandong.

3b. *Sanguisorba applanata* var. *villosa* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 17(1): 11. 1979.

柔毛宽蕊地榆 rou mao kuan rui di yu

Stipules and leaflets abaxially densely villous. Sepals pale pink. Fl. Aug.

• Shandong.

4. *Sanguisorba filiformis* (J. D. Hooker) Handel-Mazzetti, Symb. Sin. 7: 524. 1933.

虫莲 chong liang

Poterium filiforme J. D. Hooker, Fl. Brit. India 2: 362. 1878.

Herbs perennial, monoecious, 8–35 cm tall. Rootstock brown, terete. Stems slender, glabrous. Radical leaves: stipules brown, membranous, abaxially glabrous; petiole glabrous; leaf blade with 3–5 pairs of leaflets; leaflets shortly petiolulate, rarely subsessile, broadly ovate or suborbicular, 0.4–1.5 cm, both surfaces glabrous, base subcordate to rounded, margin obtusely serrate, apex rounded, rarely truncate; cauline leaves: stipules green, herbaceous, margin entire or serrate; leaf blade resembling that of radical leaves but leaflets fewer higher up stem. Inflorescences capitate, subglobose, 3–7 mm in diam., with male flowers surrounding females; bracts ovate, minute, membranous, glabrous, margin entire or sparsely ciliate. Sepals 4, white, narrowly elliptic to long obovate, abaxially glabrous. Stamens 7 or 8; filaments filiform, nearly 2 × as long as sepals. Style filiform, 0.5–1.5 × as long as sepals; stigma dilated, papillate. Fruiting hypanthium longitudinally 4-ribbed; sepals deciduous when mature. Fl. and fr. Jun–Sep.

Meadows on mountain slopes, marshes; 1200–4500 m. Sichuan, Xizang, Yunnan [Bhutan, Sikkim].

This species is used medicinally.

5. *Sanguisorba diandra* (J. D. Hooker) Nordborg, Opera Bot. 11(2): 60. 1966.

疏花地榆 shu hua di yu

Poterium diandrum J. D. Hooker, Fl. Brit. India 2: 362. 1878; *Sanguisorba dissita* T. T. Yu & C. L. Li.

Herbs perennial, 40–85 cm tall. Rootstock stout, terete. Stems glandular pubescent or glabrescent. Radical leaves: petiole glandular pubescent or glabrescent; leaf blade with 5–8 pairs of leaflets; petiolules 0.5–2 cm; leaflets alternate or subopposite, abaxially tinged green, adaxially green, ovate, elliptic, or long elliptic, 1–3 × 0.8–2.5 cm, abaxially sparsely pilose, adaxially glabrous, base cordate to truncate, margin obtusely or acutely incised serrate, apex rounded; middle cauline leaves: stipules falcate, margin incised serrate. Inflorescences capitate, lax after anthesis; bracts lanceolate, margin ciliate; flowers long pedicellate at base of inflorescence, gradually becoming subsessile toward apex. Hypanthium abaxially pilose. Sepals 4, tinged green. Stamens 2; filaments filiform, nearly equaling sepals. Style slender; stigma dilated, papillate, much branched. Fruiting hypanthium hardened, with 4 longitudinal, winged ribs; sepals persistent; style deciduous. Fl. and fr. Jun–Aug.

Forest margins, thickets, meadows on mountain slopes; 3200–3900 m. Xizang [Bhutan, ?N India (Uttar Pradesh), Nepal, Sikkim].

6. *Sanguisorba alpina* Bunge in Ledebour, Fl. Altaic. 1: 142. 1829.

高山地榆 gao shan di yu

Sanguisorba linostemon Handel-Mazzetti.

Herbs perennial, 30–80 cm tall. Rootstock robust, terete. Stems glabrous or subglabrous. Radical leaves: stipules yellow-brown, membranous, glabrous; petiole glabrous; leaf blade with 4–7(–9) pairs of leaflets; leaflets petiolulate, green on both surfaces, elliptic or long elliptic, rarely ovate, 1.5–7 × 1–4 cm, both surfaces glabrous, base subcordate to truncate, margin acutely incised serrate, apex rounded or subrounded; cauline leaves: stipules green, ovate or falcate-semiorbicular, leathery, margin sharply incised serrate; leaf blade resembling that of radical leaves but leaflets fewer higher up stem with base rounded to broadly cuneate. Inflorescence nodding, spicate, cylindrical, rarely ellipsoid, usually 1–4 × 0.6–1.2 cm, elongated to 5 cm after anthesis, flowering from base to apex; peduncle usually pilose, later glabrescent; bracts tinged yellow-brown, ovate-lanceolate or spatulate-lanceolate, longer than flower buds before anthesis, 1–2 × as long as sepals, abaxially and at margin densely pubescent. Sepals white or slightly pinkish, ovate. Stamens 4; filaments gradually dilated from base, broadest near middle, then gradually attenuate toward apex, 2–3 × as long as sepals, narrower than anther, or sometimes little dilated. Fruiting hypanthium pilose; sepals persistent. Fl. and fr. Jul–Aug.

Forest margins, mountain slopes, ravines, marshes; 1200–2700 m. Gansu, N Ningxia (Helan Shan), Xinjiang [Korea, Mongolia, Russia].

7. *Sanguisorba stipulata* Rafinesque, Herb. Raf. 47. 1833.

大白花地榆 da bai hua di yu

Poterium sitchense (C. A. Meyer) S. Watson; *Sanguisorba canadensis* Torrey & A. Gray subsp. *latifolia* (Hooker) Calder; *S. canadensis* var. *latifolia* Hooker; *S. canadensis* var. *sitchensis* (C. A. Meyer) Koidzumi; *S. latifolia* (Hooker) Coville; *S. sitchensis* C. A. Meyer; *S. stipulata* var. *latifolia* (Hooker) H. Hara.

Herbs perennial, 35–80 cm tall. Rootstock robust, deep, long. Stems glabrous. Radical leaves: stipules yellow-brown, membranous, glabrous; petiole angular, glabrous; leaf blade with 4–6 pairs of leaflets; leaflets petiolulate, green on both surfaces, abaxially more deeply so, elliptic or ovate-elliptic, both surfaces glabrous, base cordate to deeply so, rarely slightly so, margin coarsely acutely incised serrate, apex rounded; cauline leaves 2–4; stipules green, ovate, herbaceous, margin incised serrate; leaf blade resembling that of radical leaves but leaflets fewer higher up stem. Inflorescence erect, spicate; peduncle glabrous; bracts narrowly fasciated, nearly equaling sepals, glabrous or abaxially pilose. Sepals 4, elliptic-ovate, glabrous. Stamens 4; filaments compressed-dilated from middle to apex, broadest at apex, 2–3 × as long as sepal, nearly as broad as anther. Fruiting hypanthium pilose; sepals persistent. Fl. and fr. Jul–Sep.

Thinned forests, forest margins, mountains, ravines, marshy places; 1400–2300 m. Jilin, Liaoning [Japan, Korea, Russia; North America].

This species is used medicinally.

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