

1. **CALTHA** Linnaeus, Sp. Pl. 1: 558. 1753.

驴蹄草属 *lu ti cao shu*

Li Liangqian (李良千); Michio Tamura

Herbs perennial, glabrous, with fibrous roots. Stems simple or several branched. Leaves basal, or both basal and cauline, sometimes distal cauline ones palmately lobed, orbicular, reniform, or ovate, base cordate, margin dentate or entire; petioles sheathed at base. Flower solitary, terminal, or 2 or more in a simple or complex monochasium opening nearly flat. Sepals 5 or more, petaloid, yellow, rarely white or red, obovate or elliptic, caducous. Petals absent. Stamens numerous; anthers elliptic to oblong; filaments linear. Follicles 5–40, sessile, sometimes stipitate, with branching transverse veins, styles distinct or nearly absent; ovules several to many. Seeds several in a follicle, ellipsoid-globose, smooth.

About 15 species: temperate and cold-temperate regions of N and S hemispheres; four species (one endemic) in China.

1a. Stigmas nearly sessile; seeds less than 1 mm; sepals white or pinkish, ca. 3 mm; follicles (10–)20–30 4. *C. natans*

1b. Styles distinct; seeds 1–2.5 mm; sepals yellow, rarely red, more than 7 mm; follicles 5–12.

2a. Follicles shortly stipitate 3. *C. scaposa*

2b. Follicles sessile.

3a. Leaves both basal and cauline; flowers usually (2 or)3–5 or more in a complex monochasium 1. *C. palustris*

3b. Leaves all basal; flower solitary, terminal 2. *C. sinogracilis*

1. **Caltha palustris** Linnaeus, Sp. Pl. 1: 558. 1753.

驴蹄草 *lu ti cao*

Plants with numerous fleshy roots. Stems 10–120 cm tall at fruiting, (1.5–)3–12 mm in diam., branched, rarely simple, basal leaves 3–7, long petiolate; petiole (4–)7–24 cm; leaf blade orbicular to orbicular-reniform or cordate, (1.2–)2.5–5 × (2–)3–9 cm, base deeply cordate, margin densely denticulate, apex rounded. Cauline leaves usually diminishing upward, rarely equal to basal leaves in size, orbicular-reniform or triangular-cordate, shortly petiolate or uppermost ones sessile. Monochasium often solitary, (2 or)3–5-flowered; pedicels more than 1.5 cm at fruiting. Flowers 2–3 cm in diam. Sepals 5, yellow, obovate to narrowly obovate, 1–1.8(–2.5) × 0.6–1.2(–1.5) cm, apex rounded. Stamens 4.5–7(–9) mm; anthers sessile, oblong, 1–1.6 mm. Follicles (5–)7–25, ca. 1 cm × 3 mm; persistent style 1–3 mm. Seeds black, rarely pale greenish brown, narrowly ovoid, 1.5–2 mm. Fl. May–Sep. $2n = 16, 32, 55–57, 60, 64, 80$.

Mountain regions, grassy slopes, valleys, marshlands, forests, by streams, in water; 600–4000 m. S and SW Gansu, Guizhou, Hebei, Heilongjiang, W Henan, Jilin, Liaoning, Nei Mongol, Shanxi, Sichuan, Xinjiang, E and SE Xizang, C and NW Yunnan, Zhejiang [most temperate regions of N hemisphere].

1a. Uppermost cauline leaves and bracts palmatipartite 1e. var. *umbrosa*

1b. Uppermost cauline leaves and bracts undivided.

2a. Stems to 120 cm tall, ca. 12 mm in diam. at fruiting; cauline leaves below inflorescence subequal to basal leaves in size 1f. var. *barthei*

2b. Stems to 50 cm tall, ca. 6 mm in diam. at fruiting; leaves below inflorescence usually smaller than basal leaves.

3a. Stem decumbent after anthesis; leaf blades broadly triangular-reniform, broadly cordate at base,

margin

dentate basally, repand or subentire apically 1c. var. *sibirica*

3b. Stem erect; leaf blades orbicular-reniform or suborbicular, rarely triangular-reniform, usually deeply cordate at base, margin dentate throughout.

4a. Styles 2–3 mm 1d. var. *himalaica*

4b. Styles 1(–1.5) mm.

5a. Leaves herbaceous or subpapery; pedicels 2–10 cm 1a. var. *palustris*

5b. Leaves thin herbaceous or membranous; pedicels to 14 cm . 1b. var. *membranacea*

1a. **Caltha palustris** var. **palustris**

驴蹄草(原变种) *lu ti cao (yuan bian zhong)*

?*Caltha palustris* var. *orientalisinensis* X. H. Guo.

Stems usually erect, hollow, to 50 cm tall, ca. 6 mm in diam. at fruiting. Leaf blade orbicular-reniform or suborbicular, rarely triangular-reniform, herbaceous or subpapery, base usually deeply cordate, margin dentate. Pedicels more than 2 cm, to 15 cm at fruiting.

Mountain regions, wet places, grassy slopes, valleys, marshlands, forests; 600–4000 m. S Gansu, Guizhou, Hebei, W Henan, Nei Mongol, Shanxi, Sichuan, Xinjiang, E Xizang, NW Yunnan, Zhejiang [temperate to cold regions of northern hemisphere].

1b. **Caltha palustris** var. **membranacea** Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 15: 62. 1842.

膜叶驴蹄草 *mo ye lu ti cao*

Caltha membranacea (Turczaninow) Schipczinsky; *C. membranacea* var. *grandiflora* S. H. Li & Y. H. Huang.

Stems erect, hollow, to 50 cm tall, ca. 6 mm in diam. at fruiting. Leaf blade orbicular-reniform or suborbicular, rarely triangular-reniform, thinly herbaceous or membranous, base usually deeply cordate, margin

dentate. Pedicels to 5 cm, to 14 cm at fruiting. $2n = 32, 64$.

Wet places in valleys, forests. Heilongjiang, Jilin, Liaoning [Korea, Mongolia, Russia (E Siberia)].

Alexander N. Luferov (pers. comm.) suggests that this taxon should be treated at the rank of species.

1c. *Caltha palustris* var. *sibirica* Regel, Bull. Soc. Imp. Naturalistes Moscou 34: 53. 1861.

三角叶驴蹄草 san jiao ye lu ti cao

Caltha palustris subsp. *sibirica* (Regel) Hultén; *C. sibirica* (Regel) Tolmatchev.

Stems decumbent at anthesis, solid, to 50 cm tall, ca. 6 mm in diam. at fruiting. Leaves below inflorescence usually smaller than basal leaves. Leaf blades broadly triangular-reniform, base broadly cordate, margin dentate basally, repand or subentire apically. $2n = 56–80$.

Marshes, wet places in valleys, in water. Heilongjiang, Jilin, Liaoning, Nei Mongol [Korea, Mongolia, Russia (Far East)].

1d. *Caltha palustris* var. *himalaica* Tamura, Acta Phytotax. Geobot. 19: 76. 1962.

长柱驴蹄草 chang zhu lu ti cao

Stems erect, solid, to 50 cm tall, ca. 6 mm in diam. at fruiting. Leaves below inflorescence usually smaller than basal leaves. Leaf blades orbicular-reniform or suborbicular, rarely triangular-reniform, base usually deeply cordate, margin dentate throughout. Styles 2–3 mm.

Mountain regions, wet places; 2800–3100 m. SE Xizang [Bhutan, Nepal].

1e. *Caltha palustris* var. *umbrosa* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 264. 1912.

掌裂驴蹄草 zhang lie lu ti cao

Caltha palustris var. *sibirica* Regel subvar. *palmata* Takeda.

Stems erect. Uppermost cauline leaves and bracts palmatipartite.

• Grassy valley areas; ca. 2900 m. SW Sichuan, C and NW Yunnan.

1f. *Caltha palustris* var. *barthelii* Hance, Ann. Sci. Nat., Bot. Ser. 5, 5: 205. 1866.

空茎驴蹄草 kong jing lu ti cao

Caltha fistulosa Schipczinsky; *C. fistulosa* f. *atrorubra* W. T. Wang; *C. palustris* var. *barthelii* f. *atrorubra* (W. T. Wang) W. T. Wang; *C. palustris* var. *multiflora* Komarov ex Schipczinsky.

Stems erect, hollow, to 1.2 m tall, ca. 1.2 cm in diam. at fruiting. Cauline leaves below inflorescence subequal to basal leaves in size. $2n = 32, 60$.

By streams; 1000–3800 m. SW Gansu, S and W Sichuan, E Xizang, NW Yunnan [Japan, Russia (Far East)].

2. *Caltha sinogracilis* W. T. Wang in W. T. Wang & P. K. Hsiao, Acta Phytotax. Sin., Addit. 1: 50. 1965.

细茎驴蹄草 xi jing lu ti cao

Caltha gracilis Handel-Mazzetti (1923), not Nakai (1922); *C. rubriflora* B. L. Burt & Lauener; *C. sinogracilis* f. *rubriflora* (B. L. Burt & Lauener) W. T. Wang.

Plants small, glabrous. Stems more than 4 cm tall, to 10 cm at fruiting, ca. 1 mm in diam., simple to 7-branched. Leaves all basal, long petiolate; petiole 3–5 cm; leaf blade orbicular-reniform or reniform-cordate, 1–1.7 × 1.2–3.5 cm, herbaceous, base deeply cordate, margin crenate or dentate basally, apex rounded. Flower solitary, terminal, ca. 2 cm in diam. Pedicels 3–4 cm. Sepals 5, yellow, rarely red, narrowly elliptic, ca. 1.4 cm × 4.5 mm, apex rounded. Stamens ca. 3 mm; anthers oblong, ca. 1 mm. Follicles 5–10, sessile; persistent style ca. 0.8 mm. Seeds dark brown, narrowly ellipsoid-globose, ca. 1.5 mm.

• Grasslands, by streams; 3200–4100 m. SE Xizang, NW Yunnan.

3. *Caltha scaposa* J. D. Hooker & Thomson, Fl. Ind. 1: 40. 1855.

花葶驴蹄草 hua ting lu ti cao

Caltha palustris Linnaeus var. *scaposa* (J. D. Hooker & Thomson) Maximowicz; *C. scaposa* var. *parnassioides* Ulbrich; *C. scaposa* var. *smithii* Ulbrich.

Plants small. Stems simple or branched, more than 3.5 cm tall, to 24 cm at fruiting, 1–2 mm in diam. Basal leaves 3–10, long petiolate; petiole 2.5–10(–15) cm, base with membranous sheath; leaf blade cordate-ovate or triangular-ovate, sometimes reniform, 1–3(–3.7) × 1.2–2.8(–4) cm, base deeply cordate, margin entire or repand, sometimes sparsely denticulate, apex rounded. Cauline leaves shortly petiolate or sometimes sessile, small. Flower solitary, terminal, or 2 in monochasium. Pedicels more than 3 cm, to 20 cm at fruiting. Sepals 5(–7), yellow, obovate, elliptic or ovate, 0.9–1.5(–1.9) × 0.7–1.4 cm, apex rounded. Stamens 3.5–7(–10) mm; anthers oblong. Follicles (5–)6–8(–11), 1–1.6 cm × 2.5–3 mm, shortly stipitate; persistent style ca. 1 mm. Seeds black. Fl. Jun–Sep, fr. Jul.

Alpine meadows, wet places in valleys; 2800–4100 m. S Gansu, S Qinghai, W Sichuan, SE Xizang, NW Yunnan [Bhutan, N India, Nepal, Sikkim].

4. *Caltha natans* Pallas, Reise Russ. Reich. 3: 284. 1766.

白花驴蹄草 bai hua lu ti cao

Thacla natans (Pallas) Deyl & Sojak.

Plants submerged or creeping. Stems 20–50 cm tall, 2–4 mm in diam., branched. Cauline leaves long petiolate; petiole 2.5–7 cm, sheathed at base; leaf blade cordate-reniform or cordate, 1–2 × 1.5–2.4 cm, base deeply cordate-reniform or cordate, margin entire or repand or crenulate below middle, apex rounded. Monochasium terminal, (2- or)3–5-flowered. Pedicels 2–4 cm. Flowers small, ca. 5 mm in diam. Sepals 5, white or pinkish, obovate, ca. 3 × 2 mm, apex rounded. Stamens ca. 2 mm; anthers elliptic, ca. 0.5 mm. Follicles (10–)20–30, ca. 5 mm, sessile; stigmas nearly sessile. Seeds black, ellipsoid-globose, less than 1 mm. Fl. Jul. $2n = 16, 32$.

Wet meadows, marshes, in water. Heilongjiang, NE Nei Mongol [Mongolia, Russia (Siberia); North America].

Flora of China 6: 135–136. 2001.