
鹿蹄草属 lu ti cao shu

Qin Haining (覃海宁); Peter F. Stevens

Amelia Alefeld; Brasilia Rafinesque; Erxlebienia Opiz ex Rydberg; Thelaia Alefeld.

Herbs suffruticose, evergreen, erect, glabrous. Rootstock long, slender, branched, with sparse fine roots. Aerial stem ascending, not branched, scaly at base. Leaves in a rosette at base of caudex, long petiolate; leaf blade abaxially light green, adaxially green, margin entire or serrate. Scapes long, slender, with scalelike bracts at base. Flowers many, nodding, in racemes. Calyx 5-lobed, persistent. Stamens glabrous; anthers opening by pores. Ovary depressed-globose; style exserted, usually curved distally and dilated apically into a ring; stigma capitulate, shortly 5-lobed. Capsules nodding, valves connected by fibers at valve margins. Seeds many, small, with thin testa prolonged at both ends. n = 23, 46.

Between 30 and 40 species: N temperate regions, extending south to Indonesia (N Sumatra); 26 species (15 endemic) in China.

Pyrola chouana Chang Y. Yang (Bull. Bot. Res., Harbin 5: 167. 1985) was described from N Xinjiang (Burqin). However, we have seen no specimens and are therefore unable to treat it in this account. Further revision is necessary.

1a. Leaves reniform to cordate-ovate, base cordate.

1b. Leaves not as above.

2a. Leaves cordate-ovate, adaxially green, abaxially purplish red, margin crenate; calyx lobes triangular; 
bracts ovate ................................................................. 3. P. atropurpurea

2b. Leaves reniform or reniform-orbicular, adaxially dark green, abaxially light green, margin sinuate; calyx lobes 
suborbicular; bracts narrowly lanceolate ................................................................. 19. P. renifolia

3a. Corolla purplish red or only brownish purple outside.

3b. Corolla white, green, yellow, or yellowish green, sometime pinkish red.

4a. Plants 8–10 cm tall; leaves 1.8–2.5 × 1.2–1.7 cm; anthers yellow .............................................. 13. P. markonica

4b. Plants taller than 15 cm; leaves 2.5 × 1.7 cm or more; anthers dark purple or red.

5a. Leaves oblong or oblong-ovate; scale-leaf at base of scape narrowly ensiform; sepals oblong, 2.5–3 mm; 
style not exserted ......................................................................................................... 6. P. corbieri

5b. Leaves suborbicular, ovate, or ovate-elliptic; scale-leaf at base of scape narrowly oblong or ovate-oblong; 
sepals triangular-lanceolate, 3.5–5 mm; style exserted ...................................................... 2. P. asarifolia

6a. Leaves only 1(or 2).

6b. Leaves more numerous.

7a. Plants 8–10 cm tall; leaves 1.8–2.5 × 1.2–1.7 cm; anthers yellow .............................................. 13. P. markonica

7b. Plants taller than 15 cm; leaves 2.5 × 1.7 cm or more; anthers dark purple or red.

8a. Leaves thickly leathery, rough, wrinkled.

8b. Leaves leathery, smooth, not wrinkled.

9a. Bracts broadest above middle; petals oblong, margin dentate, apex broadly rounded ..................... 26. P. xinjiangensis

9b. Bracts broadest at or below middle; petals ovate-lanceolate to ± triangular, margin entire, apex 
obtuse or acuminate.

10a. Margin of leaf blade sinuate; petals ovate-lanceolate or triangular-lanceolate, apex acuminate .......... 21. P. rugosa

10b. Margin of leaf blade crenate; petals triangular or triangular-ovate, apex obtuse, rarely acute .......... 10. P. forrestiana

11a. Sepals broadly triangular, ovate-triangular, or triangular-ovate.

11b. Sepals ovate to oblong or ligulate.

12a. Leaves 1–1.6 × 1–1.2 cm; petals triangular-ovate ................................................................. 5. P. chlorantha

12b. Leaves ca. 2 × 1.5 cm or more; petals broadly elliptic or ovate-triangular.

13a. Leaves elliptic or ovate-elliptic; style 6–7 mm ................................................................. 22. P. shanxiensis

13b. Leaves broadly elliptic or suborbicular to broadly ovate; style less than 4 mm.

14a. Margin of leaf blade sinuate; styles 3–3.5 mm, slightly curved towards apex ....................... 23. P. sororia

14b. Margin of leaf blade crenate; styles 2–2.2 mm, erect .................................................. 16. P. minor

15a. Styles less than 6 mm, not or slightly exserted.

15b. Styles ca. 6 mm or more.

17a. Raceme 1.5–2.8 cm, 3–5-flowered ................................................................................. 25. P. tschanbaishanica

17b. Raceme longer than 2.8 cm, 5– or more flowered.

18a. Sepals ligulate, apex mucronate, margin slightly sinuate ..................................................... 24. P. szechuanica

18b. Sepals usually ovate, apex acuminate, margin entire or nearly so.

19a. Leaves often with white stripes over veins adaxially.

花叶鹿蹄草  hua ye lu ti cao

Herbs to 20 cm tall. Leaves approximate to remote; petiole 3–4 cm; leaf blade deep green with pale veins adaxially, ovate or ovate-elliptic, 3–4 × 1.5–3 cm, leathery, base rounded, abruptly decurrent, margin with remote, minute teeth, apex acute, mucronulate. Scape ca. 10 cm; scales basal; raceme 1–4-flowered, 2–4 cm. Pedicel ca. 4 mm; bract linear, 8–10 mm. Flowers semipendent, 1.5–1.8 cm in diam. Sepals narrowly oblong, 5–6 × ca. 2.5 mm, apex obtuse. Petals white, obovate-orbicular, 7–7.5 × ca. 6 mm, apex rounded. Filaments complanate, yellow, 3–3.5 × 1–1.2 mm, tubules present. Style exserted, 8–10 mm, upper part curved, dilated at apex, without ring of lobes. Capsules 7–8 mm in diam. Fl. and fr. Jan.

- Middle elevations. Taiwan.


红花鹿蹄草  hong hua lu ti cao

*Pyrola rotundifolia* Linnaeus var. *incarnata* de Candolle, Prodr. 7: 773. 1839; *P. asarifolia* var. *incarnata* (de Candolle) Fernald; *P. incarnata* (de Candolle) Freyn; *P. incarnata* var. *ovatifolia* Y. Z. Zhao; *P. rotundifolia* subsp. *incarnata* (de Candolle) Krylov; *P. rotundifolia* var. *purpurea* Bunge.

Herbs 1–5 cm tall. Rhizome creeping, long, somewhat thick, 0.7–2 mm in diam., branched, with sparse fine roots. Stems ascending. Leaves appearing radical, 3–8, in 2 or 3 subverticils of 3 or 4 each; petiole 3–5 cm; leaf blade pale green abaxially, green and shiny adaxially, elliptic or ovate-elliptic, 2.5–5.5 × 1.5–5.5 cm, base rounded or scarcely cordate, rarely subacute, margin obscurely serrulate, apex rounded to obtuse. Scape erect, 10–25 cm tall, angled, glabrous, with 4 or 5 broadly lanceolate-elliptic membranous basal scales and 1–4 lanceolate scales near midle; raceme densely 7–15-flowered. Bracts broadly lanceolate, membranous, apex acuminate. Flowers drooping, zygomorphic. Sepals narrowly ovate to broadly lanceolate, ca. 2 × as long as wide, 1.7–4.7 × 1.1–2.3 mm, apex acute to acuminate. Petals rose, 5–9 × 3–6 mm. Filaments curved upward; anthers dark purple, gathered above style, 1.4–3 mm, tubules present, opening by narrow terminal pores. Style exserted, curved, 6–10 mm, dilated at apex into a ring; stigma with a collar and 5 erect cylindric lobes. Capsules 7–8 mm in diam. Fl. Jun, fr. Jul–Oct.

Dry deciduous broad-leaved and coniferous forests; sea level to 2500 m. Hebei, Heilongjiang, ?Henan, Jilin, Liaoning, E Nei Mongol, ?Ningxia, Shanxi, ?Sichuan, Xinjiang [Japan, N Korea, Mongolia, Russia].


紫背鹿蹄草  zi bei lu ti cao

*Pyrola atropurpurea* var. *gracilis* Andres; *P. gracilis* (Andres) Andres.

Herbs 7–18 cm tall. Rhizome slender, branched. Leaves 2–4, crowded at base of aerial shoots; leaf blade reddish purple abaxially, green adaxially, cordate-ovate, (1–)1.5–3 × (1–)1.2–3 cm, papery, base cordate, margin slightly crenulate, apex obtuse. Scape erect, slender, without scales or 1 or 2 scale-shaped leaves, green-brown, lanceolate, membranous; raceme 2–4(–5) mm, naked or with 1 or 2 minute lanceolate bracts, 2–4-flowered. Pedicel 3–5 mm; bracts ovate, ca. 2 mm. Flowers nodding, cup-shaped, 0.8–1.5 cm in diam. Sepals reddish purple, ovate-triangular, ca. 1.5 × 1.5 mm, apex obtuse. Petals white, oblong-obovate, 5–7 × 3–5 mm, apex obtuse. Filaments glabrous; anthers yellow, ca. 3 × 1.5 mm, tubules present. Style exserted, recurved, 9–11 mm, dilated at apex into ring; stigma thickened, with 5 round lobes. Capsules 5–6 mm in diam. Fl. Jun–Jul, fr. Aug–Sep.
4. Pyrola calliantha

Pyrola andrewsii Kříža; P. calliantha var. tibetana (Andres) Y. L. Chou; P. hopeiensis Nakai; P. rockii Kříža; P. rotundifolia Linnaeus subsp. chinensis (Andres) Andres; P. rotundifolia var. chinensis Andres; P. rotundifolia var. communis Andres; P. rotundifolia var. laurifolia Andres; P. rotundifolia var. sphaeroides Andres; P. rotundifolia subsp. tibetana Andres; P. rotundifolia var. tibetana Andres.

Herbs (10–)15–30 cm tall. Rhizome long, slender, branched, producing adventitious roots and aerial stems at nodes; caudex ribbed, 15–30 cm, with a basal rosette of crowded leaves and 1 or 2 bracts; bracts brownish, oblong-ovate, sheathing, scales. Petiole 2–5.5 cm; leaf blade purplish and often glaucous abaxially, green adaxially, elliptic or ovate, (2.5–)3.6 × 2–3.5 cm, leathery, base broadly cuneate or subcordate, margin entire or crenulate, apex obtuse or rounded. Scape with 1 or 2 ovate-lanceolate or lanceolate scalelike bracts sheathing at base; raceme 9–13-flowered, 12–16 cm. Pedicel 5–8(–10) mm; bracts ligulate, 6–7.5 mm. Flowers spreading or rarely nodding, rotate, 1.5–2 cm in diam. Sepals ligulate, (3.5–)7.5 × (1.5–)2.3 mm, margin entire, apex often acute. Petals pure white, obovate-elliptic or obovate, 6–10 × 5–8 mm. Filaments glabrous; anthers yellow, (2.1–)2.5–4 × 1–1.4 mm, tubules present. Style ± exerted, light red, 6–8(–10) mm, nearly erect or upper part slightly curved upward, dilated at apex into a ring. Capsule 7–9 mm in diam. Fl. Jun–Aug, fr. Aug–Sep.

5. Pyrola chlorantha

Pyrola solunica S. D. Zhao; P. virens Schweigg; Thelaia chlorantha (Swartz) Alefied.

Herbs 11–18 cm tall. Rhizome long, slender, branched. Aboveground stem very short. Leaves 2–4, basal; petiole 2–5 cm; leaf blade pale abaxially, dark green adaxially, rather dull, subcordate, 1.16 × 1–1.2 cm, leathery, base rounded to acute, margin minutely crenulate, apex rounded. Scape including inflorescence 10–20 cm high, usually with a solitary scale; raceme laxly 2–8-flowered, slightly nutant, nodding, 1.5–3.5 cm. Pedicel 4–5 mm; bracts lanceolate. Flowers cup-shaped, ca. 1 cm in diam. Sepals triangular-ovate, ca. as long as wide, 1–1.5 mm, basal widest 1–1.5 mm, apex ± acute or obtuse. Petals greenish white, ovate or elliptic, 5–6 mm. Filaments dilated at base; anthers yellow, oblong, mucronate at distal end; tubules curved, pores oblique. Style exerted, longer than petals, strongly bent, somewhat thickened upwards, dilated at apex into ring. Capsule ca. 6 mm in diam. Fl. Jun, fr. Aug.

Pyrola alba var. mongolica forests; below 1000 m. Nei Mongol [Mongolia].

6. Pyrola corbieri

Pyrola americana Swartz var. dahurica Andres. 

Herbs 11–33 cm tall. Rhizome ascending, slender, branched. Leaves 2–6, basal. Scales at stem base 1–3 mm wide, not or slightly sheathing. Petiole 1–3.5 cm; leaf blade dark green with pale veins adaxially, oblong or oblong-ovate, 3.5–7 × 1.5–3.5 cm, slightly leathery, base cuneate or attenuate, margin entire or slightly crenate, apex subacute. Scape 2 cm in diam., narrowly winged, scalelike leaves 1 or 2, brown, narrowly linear, 1–1.5 cm, base slightly amplexicaul, apex acuminate or acute; raceme 4–9-flowered, short, 1.5–2.5(–4) cm. Flowers nodding, broadly saucer-shaped, relatively large. Pedicel 5–8 mm, bract axillary, narrowly lanceolate, 5–8 mm, longer or ca. as long as pedicel, membranous, apex acuminate. Sepals purplish brown, oblong, ca. 4 × 1.5–2 mm, apex obtuse or acute. Petals white, obovate or orbicular, 5–7 × 4–5 mm. Filaments glabrous; anthers red, ca. 3 mm. Style included or slightly exerted, distinctly curved, dilated at apex into a ring. Capsule 6–8 mm in diam. Fl. Jul–Aug, fr. Sep–Oct.

Streamsides in Pinus forests; 2100–2700 m. Guangxi, Guizhou, Sichuan [Bhutan].

7. Pyrola dahurica

Pyrola americana Swartz var. dahurica Andres. 

Herbs 15–23 cm tall. Rhizome long, slender, branched. Leaves (2 or)3–6(–7), crowded at base of caudex; petioles 2.8–4.5 cm; leaf blade light green abaxially, green adaxially, subcordate or broadly ovate, (2.5–)3–5 × 2.5–4 cm, leathery, base broadly cuneate or orbicular, margin entire or slightly crenate, apex obtuse or rounded. Raceme 5–10-flowered, 4–8(–10) cm. Pedicel 4–5 mm; bracts ligulate or lanceolate, 4–5 mm. Flowers nodding, spreading, ca. 1 cm in diam. Sepals ligulate, rarely lanceolate, 3–4 × ca. 1.5 mm, margin remotely denticulate, apex often acute. Petals white, obovate, 5–7 × 4–5 mm, apex rounded. Filaments short, ca. 5 mm, glabrous; anthers yellow, 2.5–2.7 × 1–1.5 mm, tubules present. Style slightly exerted, 6–7 mm, upper part curved upward, dilated at apex into a ring, conspicuously so at least at fruiting. Capsule ca. 5 mm in diam. Fl. Jul, fr. Aug.

Coniferous forests, mixed forests, becoming dominant in herbaceous layer; 700–1800 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Mongolia].

8. Pyrola decorata

Pyrola americana Swartz var. dahurica Andres. 

Herbs 15–23 cm tall. Rhizome long, slender, branched. Leaves (2 or)3–6(–7), crowded at base of caudex; petioles 2.8–4.5 cm; leaf blade light green abaxially, green adaxially, subcordate or broadly ovate, (2.5–)3–5 × 2.5–4 cm, leathery, base broadly cuneate or orbicular, margin entire or slightly crenate, apex obtuse or rounded. Raceme 5–10-flowered, 4–8(–10) cm. Pedicel 4–5 mm; bracts ligulate or lanceolate, 4–5 mm. Flowers nodding, spreading, ca. 1 cm in diam. Sepals ligulate, rarely lanceolate, 3–4 × ca. 1.5 mm, margin remotely denticulate, apex often acute. Petals white, obovate, 5–7 × 4–5 mm, apex rounded. Filaments short, ca. 5 mm, glabrous; anthers yellow, 2.5–2.7 × 1–1.5 mm, tubules present. Style slightly exerted, 6–7 mm, upper part curved upward, dilated at apex into a ring, conspicuously so at least at fruiting. Capsule ca. 5 mm in diam. Fl. Jul, fr. Aug.

Coniferous forests, mixed forests, becoming dominant in herbaceous layer; 700–1800 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Mongolia].
corata var. alba (Andres) Y. L. Chou & R. C. Zhou; P. handeliana Andres; P. oreodoxa Andres.

Herbs 15–35 cm tall. Rootstock long, slender, branched. Leaves 3–6, crowded at base of caudex; petiole 2–3 cm; leaf blade light green and purplish axially, deep green with pale veins adaxially, oblanceolate or obovate-oblong, (3–)5–7 × 2.5–4 cm, thinly leathery, base cuneate, decurrent, margin with remote minute teeth, apex acute or mucronulate. Scape slender, with 1 or 2 scalelike leaves; raceme 4–10-flowered, 2.5–4 cm. Pedicel 5–9 mm; bract lanceolate, 5–9 mm, membranous. Flowers ± nodding, saucer-shaped, 1–1.5 cm in diam. Sepals ovate-oblong, 3–6 × 2–2.5 mm, apex acute. Petals light green to white, obovate-oblong, 6–8 × 5–7 mm, apex rounded. Filaments glabrous; anthers yellow, 3–4 × 1–1.5 mm, tubules present. Style exerted, 6–10 mm, curved, dilated at apex into a ring. Capsules 7–11 mm in diam. Fl. Jun–Jul, fr. Jul–Aug.

Pyrola asarifolia var. japonica (Klenze ex Alefeld) Miq.; P. incarnata (de Candolle) Freyn var. japonica (Klenze ex Alefeld) Koidzumi; P. japonica var. subaphylla (Maximowicz) Andres; P. japonica f. subaphylla (Maximowicz) Ohwi; P. rotundifolia Linnaeus var. albaflora Maximowicz; P. rotundifolia f. subaphylla (Maximowicz) Makino; P. subaphylla Maximowicz.

Herbs 5–30 cm tall. Rhizome descending and sometimes creeping, somewhat thick, 0.8–2 mm in diam., sparsely branched; roots somewhat thick, to 0.5 mm in diam. Stems ascending, sometimes branched. Leaves appearing radical, 3–6, in 1 or 2 subtverticils of 1–3 each; petiole 3–8 cm; leaf blade pale green or reddish axially, deep green with pale or white veins adaxially, elliptic, broadly elliptic, or obovate, rarely orbicular, (3–)4.7 × 2.5–4.5 cm, somewhat thick, base rounded, obtuse, or subacute, margin rather sparsely and obscurely serrulate, apex rounded to obtuse. Scape erect, (6–)11.5–30 cm tall, with 3–6 scales near base; scales narrowly lanceolate or oblanceolate, costate, up to 2 leaflike scales and sometimes 1 smaller, lanceolate scale near middle; raceme rather sparsely 5–12-flowered, 6–10 cm. Pedicel with bracts broadly linear to lanceolate, 5–8 mm, apex long acuminate. Flowers drooping, zygomorphic, 10–12 mm in diam. Sepals broadly lanceolate to narrowly ovate, (1–)2.5–5(–6) × (2–)4–6 mm, apex acute. Petals ovate-elliptic, 3.5–4 × 1.6–2 mm, apex acuminate. Filaments curved upward; anthers creamy white, orange-yellow near apex, 2–3 mm, prolonged into terminal tubules, opening by terminal pores. Style exerted, sometimes scarcely so, curved to somewhat slightly so, 1.1–1.3 cm, dilated at apex but without ring-shaped protuberance; stigma with a collar and 5 erect cylindrical lobes. Capsules 7–8 mm in diam. Fl. Jun–Aug, fr. Sep–Oct.

Common, mainly in dry forests; sea level to 1500 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Taiwan [Japan, Korea].


Herbs 14–21 cm tall. Rhizome long, slender, branched. Leaves 3–6, crowded at base of caudex; petiole 2–3 cm, leaf blade light green axially, green adaxially, triangular ovate, obovate, or suborbicular, 2.5–4 × 2.5–3.5 cm, thickly leathery, rough, base rounded or truncate, margin conspicuously crenate, apex obtuse. Scales at base of scape, narrowly oblanceolate, 8–12 × 3–5 mm; raceme 6–9 cm, 9–12-flowered. Pedicel 5–10 mm; bracts oblanceolate, slightly longer than pedicel, membranous, apex acute. Flowers nodding, saucer-shaped, 1–1.5 cm in diam. Sepals triangular or triangular-ovate, 1.5–2.5 × 1.5–2 mm, apex obtuse. Petals greenish yellow, obovate or suborbicular, 7–9 × 5–7 mm. Filaments flattened; anthers yellow, oblong, tubules present. Style exerted, ca. 1 cm, curved at upper part, dilated at apex into a ring. Capsules 5–7 mm in diam. Fl. Jul–Aug, fr. Aug–Sep.

Montane forests; 1500–3800 m. Hubei, Hunan, Sichuan, Yunnan.


日本鹿蹄草  ri ben lu ti cao

Pyrola asarifolia var. japonica (Klenze ex Alefeld) Miq.; P. incarnata (de Candolle) Freyn var. japonica (Klenze ex Alefeld) Koidzumi; P. japonica var. subaphylla (Maximowicz) Andres; P. japonica f. subaphylla (Maximowicz) Ohwi; P. rotundifolia Linnaeus var. albaflora Maximowicz; P. rotundifolia f. subaphylla (Maximowicz) Makino; P. subaphylla Maximowicz.

Herbs 14–21 cm tall. Rhizome long, slender, branched. Leaves 2–6, crowded at base of caudex; petiole 1.5–3.5 cm, often shorter than blade; leaf blade light green with purple axially, green adaxially, elliptic, obovate, or ovate, 2.3–4.2 × 1.4–3.8 cm, leathery, base broadly cuneate or orbicular, margin entire or slightly crenate, apex obtuse or rounded. Scape subtended by 1–3 scalelike bracts; raceme 6–10–(15)–flowered, 3–5 cm. Pedicel 3–4 mm; bracts lanceolate, 5.7–14.1–15.5 cm, longer than pedicel, membranous. Flowers spreading, saucer-shaped, ca. 1 cm in diam. Sepals lanceolate, 4.5–5 × ca. 1 mm, margin entire, apex acuminate. Petals white, obovate, 5–6 × 3–4 mm, apex acute or obtuse. Filaments glabrous; anthers yellow, 2–2.5 × ca. 1 mm, tubules present. Style not or slightly extert-

Betula forests, coniferous forests; 700–2100 m. S Jilin (Changbai Shan) [Korea].


馬尔康鹿蹄草 ma er kang lu ti cao

Herbs 8–10 cm tall. Rhizome long, slender, branched. Leaves 4–7, basal, petiole 1–2 cm; leaf blade light green abaxially, dark green adaxially, broadly ovate-elliptic to elliptic, 1.8–2.5 × 1.2–1.7 cm, subleathery, base rounded or broadly cuneate, margin minutely glandular sinuate, apex obtuse. Scape subglobose by 2 or 3 ovate-oblong, scalelike leaves; raceme 6–8-flowered, 1.5–2 cm. Pedicel 3–4 mm; bracts broadly linear, 5–6 mm, longer than pedicel, 6–6.5 mm, apex rounded. Filaments glabrous; anthers yellow, 0.9–1.4 mm, without distinct tubules, apex truncate, opening by wide terminal pores. Style not exserted, somewhat declined, 5–5.5 mm, dilated at apex into a ring; stigma 5-lobed. Capsule compressed-globose, 4–5 × 6.5–8 mm. Fl. Jun–Jul.

Coniferous forests; 1900–2600 m. S Jilin (Changbai Shan), N Xinjiang (Altay Shan) [Mongolia, Russia; C Asia, Europe].


短柱鹿蹄草 duan zhu lu ti cao

Herbs (7–)12–20 cm tall. Rhizome creeping, long, somewhat slender, 0.5–1 mm in diam., branched, with sparse fine roots. Aerial stems ascending, short or somewhat long, 0.5–2.5 cm, not branched. Leaves appearing radical, 4–8, in 2 or 3 subverticils of 2–4 each; petiole 1–2.5 cm; leaf blade pale green abaxially, green adaxially, broadly elliptic to orbicular, 1.5–4.5 × 1.5–3 cm, base obtuse to truncate, margin crenulate to obsoletely serrulate, apex obtuse or mucronulate. Scape erect, 8–18 cm tall, angled, glabrous, with 3–5 broadly lanceolate-elliptic or broadly obovate scales at base, up to 2 leafy scales or leaves near base, and up to 2 narrowly lanceolate to broadly linear scales near middle; raceme densely 7–16-flowered, 2–3.5 cm. Pedicel 3–6 mm; bracts broadly linear, 3–6 mm, usually longer than pedicel. Flowers drooping, regular, 6–7 mm in diam. Pedicels 4–6 mm in diam. Fl. Jul, fr. Aug. 2n = 46.

Subalpine deciduous broad-leaved forests; 500–2500 m. Heilongjiang, Jilin, Xinjiang, Xizang, Yunnan [Japan, N Korea, Russia; widely distributed in cool N temperate and subarctic zones].

This is a rare species in China.


单叶鹿蹄草 dan ye lu ti cao

Herbs 11–19 cm tall. Rhizome long, slender, branched. Leaf solitary, basal; petiole ca. 3 cm; leaf blade glaucous abaxially, green adaxially, broadly elliptic or suborbicular, ca. 3 × 2.5 cm, thinly leathery, base subrounded, margin entire or crenulate, apex obtuse or rounded. Scape thick, with 3–5 ovate-lanceolate bracts, sheathed at base; raceme 5–6(–9)-flowered, with shallow and broad or sometimes flat crenations, apex rounded. Scapes 10–33 cm, with a solitary acute bract at or below middle; raceme 3–5(–7) cm, 5–12-flowered. Pedicels (5–)8–9 mm in fruit; bract oblong, longer than pedicel, 4–6 × 1.5–2.5 mm, apex rounded. Flowers slightly nodding, half-opened, spurred-shaped. Sepals redish, ovate-lanceolate, margins not overlapping, apex acuminate, often recurved at tip. Petals white or at base pinkish, elliptic or suborbicular, 6–8 × 4.5–6 mm, apex rounded. Filaments connivent around pistil, flattened, glabrous; anther yellow, (1.9–)2.1–2.3(–2.5) mm. Style slightly exerted, somewhat declined, 5–5.5 mm, dilated at apex into a ring; stigma 5-lobed. Capsule compressed-globose, 4–5 × 6.5–8 mm. Fl. Jun–Jul.

Coniferous forests; 1900–2600 m. S Jilin (Changbai Shan), N Xinjiang (Altay Shan) [Mongolia, Russia; C Asia, Europe].

1. Amelia minor (Linnaeus) Alefeld; Brazilia minor (Linnaeus) House; B. parvifolia Rafinesque; Erxlebenia minor (Linnaeus) Rydberg; E. rosea Opiz.

Herbs (7–)12–20 cm tall. Rhizome creeping, long, somewhat slender, 0.5–1 mm in diam., branched, with sparse fine roots. Aerial stems ascending, short or somewhat long, 0.5–2.5 cm, not branched. Leaves appearing radical, 4–8, in 2 or 3 subverticils of 2–4 each; petiole 1–2.5 cm; leaf blade pale green abaxially, green adaxially, broadly elliptic to orbicular, 1.5–4.5 × 1.5–3 cm, base obtuse to truncate, margin crenulate to obsoletely serrulate, apex obtuse or mucronulate. Scape erect, 8–18 cm tall, angled, glabrous, with 3–5 broadly lanceolate-elliptic or broadly obovate scales at base, up to 2 leafy scales or leaves near base, and up to 2 narrowly lanceolate to broadly linear scales near middle; raceme densely 7–16-flowered, 2–3.5 cm. Pedicel 3–6 mm; bracts broadly linear, 3–6 mm, usually longer than pedicel. Flowers drooping, regular, 6–7 mm in diam. Pedicels 4–6 mm in diam. Fl. Jul, fr. Aug. 2n = 46.

Subalpine deciduous broad-leaved forests; 500–2500 m. Heilongjiang, Jilin, Xinjiang, Xizang, Yunnan [Japan, N Korea, Russia; widely distributed in cool N temperate and subarctic zones].

This is a rare species in China.
3–4(–8.5) cm. Pedicel 5–6 mm; bracts oblanceolate, 6–7 mm, membranous. Flowers nodding. Sepals ovate-oblong or triangular-oblong, 3.5–4 × 2–2.5 mm, apex often acute. Petals white, ovate-oblong, 6–7 × 3–3.5 mm. Filaments glabrous; anthers yellow with purple, ellipsoid, 2–2.9 mm, tubules present. Style upper part curved upward, short, ca. 4 mm, dilated at apex into a ring; stigma shallowly 5-lobed. Capsule 5–6 mm in diameter. Fl. Aug., fr. Sep.


Herbs to 20 cm tall. Rhizome ascending, slender, branch- ed. Leaves 3–8, basal, alternate or subopposite; petiole 5–6 cm, complanate; leaf blade slightly green abaxially, green ad- axially, ovate-suborbicular to ovate-homic, 2.3–3 × 2.5 cm, base rounded or truncate to subacute, margin crenate- serrulate, apex rounded, obtuse, or emarginate. Scape 4–8.5(–25) cm; scales narrowed; raceme 6–11-flowered, 10–25 cm. Pedicel 7–8 mm; bracts narrowly oblong, ca. 8 × 3 mm, apex acute. Flowers ± nodding, saucer-shaped, ca. 1.5 cm in diameter. Petals white to greenish, sometimes becoming black when dry, obovate, 5.7 × 3–5.5 mm. Filaments curved upward; anthers creamy white, 2–4 mm, protruding into terminal tubules, opening by small terminal pores, terminal tubules orange-yellow. Style exerted, 5–10 mm, curved, slightly dilated at apex into a ring; stigma with a collar and 5 erect cylindrical lobes. Capsules 5–7 mm in diameter. Fl. Jun–Jul, fr. Aug.–Sep.

Shaded coniferous, mixed, and deciduous broad-leaved forests, mossy soil especially near rotted tree trunks; sea level to 200 m. Hebei, Heilongjiang, Jilin, Nei Mongol, Liaoning [Japan, Korea, Russia (Sakhalin)].


Herbs 15–25(–30) cm tall. Rhizome long, slender, branched, producing adventitious roots and aerial stems at nodes; aerial stems 15–30 cm, ribbed, with a basal rosette of crowded leaves, and higher up with 1 or 2 oblong-ovate sheathing, scale-like, brownish bracts. Rosulate leaves 4–7, semiever- green; petiole ca. 2 × or ca. as long as blades; leaf blade slightly green abaxially, green axially, slightly shiny, orbicular to ovate, (2.3)–3 × 1.5–5.5 mm. Petals in- nodding, saucer-shaped leaves 1 or 2; raceme 8–15-flowered, 6–16 cm. Pedicel 4.5–5 mm; bracts axillary, im- bricate, lanceolate, membranous. Flowers spreading or rarely nodding, 1.5–2 cm in diameter, widely opened, fragrant (scent of Convallaria majalis Linnaeus). Sepals ovate-lanceolate to lanceolate, 3.5–5.5 mm, reflexed at tip, apex rounded. Pedals incur- ved, pure white, orbicular-ovate, 6.5–10 × 4–6 mm, rather thick, apex obtuse. Stamens arched toward upper side of flower; filaments glabrous, anthers yellow, tubules present. Style 7.5–10 mm, deflexed at base and facing lower part of corolla, dilated at apex into a ring. Capsule (6–)7–8 mm in diameter. Fl. Jun– Jul, fr. unknown.


According to Haber (Syst. Bot. 8: 277–298. 1983), one of the main areas of taxonomic difficulty in Pyrola occurs in P. sect. Pyrola (see Kfisa, Bot. Jahrb. Syst. 90: 476–508. 1971, for sectional subdivisions). The type of the section is P. rotundifolia Linnaeus, a white- flowered species common throughout Europe and eastward to just beyond Lake Baikal in Siberia (cf. Hultén, Amphi-Atlantic Pl. map 123. 1958). Numerous taxa, both white- and pink-flowered, have been recognized as segregates of this widespread species, or described as distinct but related to P. rotundifolia. The assessment of taxonomic affinities within this “complex” has been problematic because of the lack of clear morphological discontinuities (Haber & Takahashi, Bot. Mag. (Tokyo) 101: 483–495).


Herbs 14–27 cm tall. Rhizome ascending, slender, branch- ed. Leaves 3–7; petiole 4.5–6.5 cm; leaf blade reddish abaxi- ally, green and shiny axially, broadly ovate or orbicular, 3.4–5.5 × 3.5–3.5 mm, thickly leathery, base rounded or truncate, margin conspicuously crenate, apex obtuse. Style: scales 1 or
2. oblong, 8–10 × 3–4 mm; raceme 5–13-flowered, 4–9 cm. Pedicel 5–7 mm; bracts lanceolate, ca. as long as petiole or slightly longer, membranous. Flowers nodding, saucer-shaped, ca. 1 cm in diam. Sepals lanceolate or lanceolate-triangular, 3–4 × 1.5–2 mm, margin entire or obscurely crenate, apex acuminate. Petals white, ovate-lanceolate or suborbicular, 6–8 × 4–6 mm, apex acute. Filaments flattened, 7–8 mm; anthers yellow, ellipsoid, ca. 3 × 1 mm, tubules present. Style not exserted, 7–10 mm, slightly curved at upper part, dilated at apex into a ring. Capsules 5–9 mm in diam. Fl. Jun–Jul, fr. Aug–Sep.

- Montane coniferous or broad-leaved forests; 1900–4000 m. Gansu, Shaanxi, Sichuan, Yunnan.


山西鹿蹄草 shan xi lu ti cao

Herbs 16–21 cm tall. Rhizome long creeping, somewhat slender, 0.5–1 mm in diam., branched. Leaves 2–6, appearing radical; petiole 1.8–2 cm; leaf blade pale green abaxially, green adaxially, elliptic or ovate-elliptic, ca. 2.5 × 1.5 cm, thinly leathery, base obtuse to broadly truncate, apex obtuse. Scape erect, 9–17 cm tall, glabrous, with 1 scalelike leaf at base; raceme 5–8 (or 9)-flowered, 5–7 cm. Pedicels shorter than bracts, 3.5–4 mm; bracts broadly linear, 4–5 mm. Flower horizontal. Sepals triangular or ovate-triangular, ca. 2.5 × 2.5 cm, apex acute. Petals white. Style 6–7 mm at fruiting, straight to slightly curved, dilated at apex into a ring. Capsules 7–8 mm in diam. Fl. unknown.

- Forests on shaded mountain slopes; ca. 1800 m. Shanxi.


珍珠鹿蹄草 zhen zhu lu ti cao

Herbs 15–30 cm tall. Rhizome ascending, branched. Scales at stem base 4–8 mm wide, sheathing. Leaves 6–8, basal; petiole 1–3 cm; leaf blade pale green abaxially, green adaxially, broadly ovate or suborbicular, 2.5–3 × 2–2.5 cm, thinly leathery, base rounded, margin remotely sinuate, apex rounded or subacute. Raceme 7–11-flowered, 3–7 cm. Pedicel 3–4 mm; bracts axillary, strap-shaped, longer than pedicel, membranous. Flowers nodding, saucer-shaped, 7–9 mm in diam. Sepals ovate-triangular, 2–2.5 mm, apex retuse. Petals white or yellowish green, broadly ovate or suborbicular, 7–8 × 5–6 mm, apex rounded. Filaments flattened, glabrous; anthers yellow, ca. 2 mm, base usually with mucro. Style slightly exserted, straight or becoming curved in upper half, 3–3.5 mm. Capsules 7–9 mm in diam. Fl. Jul–Aug, fr. Aug–Sep.

- Forests, scrub; 2700–3900 m. Xizang, Yunnan.


四川鹿蹄草 si chuan lu ti cao

Herbs 15–25 cm tall. Rhizome long, slender, branched. Leaves 3–7, crowded at base of caudex; petiole 6–7.5 cm; leaf blade light green abaxially, green and slightly shiny adaxially, broadly ovate, ovate, or broadly oblong, 4–5(–6) × (3.5–)4–5(–6.5) cm, thinly leathery, base suborbicular or subcordate, margin with remote teeth, apex obtuse. Scape with 2–4 scalelike leaves at base; raceme 6–12-flowered, 4–6 cm. Pedicel to 1 cm at fruiting; bracts lanceolate, 8–10 mm. Flowers ± nodding, widely opened, saucer-shaped, ca. 1 cm in diam. Sepals ligulate, 4–6 × 1.5–3 mm, apex mucronulate. Petals yellow or yellowish white, broadly ovate, 6–10 × 5–7 mm, apex rounded. Filaments glabrous; anthers yellow, ca. 2 mm. Style exserted, 7–9 mm, curved, dilated inconspicuously at apex into a ring. Capsules 7–8 mm in diam. Fl. Jun–Jul, fr. Aug–Sep.

- Evergreen or mixed forests; 1400–2700 m. Sichuan.


长白鹿蹄草 chang bai lu ti cao

Herbs 8–13 cm tall. Rhizome long, slender, branched. Leaves 3–5 (or 6); petiole 1.8–4 cm; leaf blade light green abaxially, green adaxially, elliptic, 1.8–2.5 × 1.3–1.9 cm, leathery, base cuneate, margin entire, slightly incurved, apex obtuse or rounded. Scape with 1–3 scalelike leaves at base; raceme 3–5-flowered, 1.5–2.8 cm, with 1–3 scalelike bracts subtending scape. Pedicels 3–4 mm; bracts ovate-lanceolate, 4.3–4.5 mm. Flowers nodding, spreading, broadly saucer-shaped, ca. 1 cm in diam. Sepals oblong or ovate-oblong, ca. 3 × 1.5 mm, apex acute. Petals white, obovate, 5–6 × 3–4 mm, margin entire and incurved, apex obtuse. Filaments glabrous; anthers yellow, ca. 2 × 1 mm. Style exserted, upper part slightly curved, ca. 8 mm, dilated at apex into an inconspicuous ring. Capsule 5–6 mm in diam. Fl. Aug, fr. Sep.

- Alpine tundra; ca. 2100 m. S Jilin (Changbai Shan).


新疆鹿蹄草 xin jiang lu ti cao

Herbs 15–20 cm tall. Rhizome long, slender, branched. Leaves 4–7, crowded at base of caudex; petiole 7–8.5 cm; leaf blade light green abaxially, green and slightly shiny adaxially, broadly ovate, ovate, or broadly oblong, 4–5(–6) × (3.5–)4–5(–6.5) cm, thinly leathery, base suborbicular or subcordate, margin with remote teeth, apex obtuse. Scape with 2–4 scalelike leaves at base; raceme 6–12-flowered, 4–6 cm. Pedicel to 1 cm at fruiting; bracts lanceolate, 8–10 mm. Flowers ± nodding, widely opened, saucer-shaped, ca. 1 cm in diam. Sepals ligulate, 4–6 × 1.5–3 mm, apex mucronulate. Petals yellow or yellowish white, broadly ovate, 6–10 × 5–7 mm, apex rounded. Filaments glabrous; anthers yellow, ca. 2 mm. Style exserted, 7–9 mm, curved, dilated inconspicuously at apex into a ring. Capsules 7–8 mm in diam. Fl. Jun–Jul, fr. Aug–Sep.
新疆鹿蹄草  xin jiang lu ti cao

Herbs 19–21 cm tall. Rhizome ascending, slender. Leaves 6–9, basal; petiole 2.5–4 cm; leaf blade light green abaxially, dark green adaxially, elliptic or suborbicular, 3–4 × 2.5–3.5 cm, thickly leathery, veins raised abaxially, impressed adaxially, base rounded or truncate, margin crisped, entire or remotely glandular, apex obtuse. Scape with 1 scalelike leaf or not at base; raceme 7–11-flowered, 6.5–7.5 cm. Pedicel 5–7 mm; bracts oblong or lanceolate. Flowers nodding, saucer-shaped, ca. 1 cm in diam. Sepals oblong, 3–4 × ca. 2 mm, margin entire or remotely crenate, apex obtuse. Petals 5, white, oblong, ca. 6 × 4 mm, adaxially sparsely hairy, margin dentate, apex rounded. Filaments flattened, ca. 5.5 mm; anthers yellow, ellipsoid, ca. 3 mm, tubules present. Style slightly exserted, ca. 6 mm, curved at upper part, dilated at apex into a ring. Fl. Jul, fr. Aug.

● Montane forests; ca. 1800 m. Xinjiang (Urumqi).