

# PLANTAGINACEAE

车前科 che qian ke

Li Zhenyu (李振宇)<sup>1</sup>, Wei Lai (魏来)<sup>1</sup>; Ronald K. Hoggard<sup>2</sup>

Herbs or small shrubs, rarely arborescent. Stipules absent. Leaves spirally alternate, usually in a basal rosette, rarely opposite or whorled, simple; leaf blade veins (1 or)3–11, arcuate. Inflorescences spikes, rarely racemes or 1-flowered, pedunculate, each flower with 1 bract. Flowers small, protogynous, bisexual, rarely polygamous or unisexual. Calyx usually 4-parted, persistent, segments imbricate. Corolla scarious or membranous, gamopetalous, actinomorphic or rarely zygomorphic, (3 or)4-lobed; lobes imbricate. Stamens (1 or 2 or)4, inserted on corolla tube, alternate with lobes; anthers free, versatile, with an apical appendage, thecae 2 and parallel. Pistil consisting of 2 carpels; ovary superior, (1 or)2-loculed, axile or rarely basal; style 1, filiform, mostly longitudinally stigmatic. Fruit a pyxis, rarely an indehiscent capsule or nutlet, with 1 to numerous seeds. Seeds minute; cotyledons narrow; endosperm fleshy.

Two genera and more than 210 species: cosmopolitan; one genus and 22 species (three endemic, four introduced) in China.

Li Zhenyu. 2002. Plantaginaceae. In: Hu Chiachi, ed., Fl. Reipubl. Popularis Sin. 70: 318–345.

## 1. PLANTAGO Linnaeus, Sp. Pl. 1: 112. 1753.

车前属 che qian shu

*Bougueria* Decaisne; *Psyllium* Miller.

Herbs, or rarely small shrubs or arborescent, annual, biennial, or perennial, acaulescent or infrequently stemmed, with a taproot, caudex, or only numerous fibrous roots. Leaves simple; petiole vaginate at base; leaf blade ovate, elliptic, oblong, lanceolate, linear, or subulate, margin entire, repand, erose, or toothed, rarely pinnately or palmately cleft. Inflorescences arising from rosette or leaf axil of stem, spikes, narrowly cylindrical, capitate, or rarely 1-flowered. Corolla salverform or tubular, persistent; tube cylindrical or constricted at throat, as long as or slightly longer than calyx; limb 4-parted. Stamens (1 or 2 or)4; anthers ovoid, suborbicular, ellipsoid, or oblong. Ovary 2-loculed or rarely 1-locular but sometimes with an apical third compartment, placentation axile or rarely basal, with 1 to numerous ovules per locule. Fruit a pyxis, rarely an indehiscent capsule or nutlet, with 1 to numerous seeds. Seeds peltately inserted; testa mucilaginous when wet; embryo straight; cotyledons parallel or vertical to ventral (hilum) side.

About 200 species: cosmopolitan; 22 species (three endemic, four introduced) in China.

- 1a. Stem erect, with elongated internodes; leaves opposite, rarely in whorls of 3; corolla brownish ..... 22. *P. arenaria*
- 1b. Stem absent or very short; leaves usually in basal rosette, rarely densely alternate; corolla white or yellowish.
  - 2a. Plant with only fibrous roots.
    - 3a. Leaf blade lanceolate to linear-lanceolate, 3–4 × as long as wide; corolla yellowish; anthers 1.8–2.2 mm ..... 7. *P. fendouensis*
    - 3b. Leaf blade broadly ovate to broadly elliptic, less than 2 × as long as wide; corolla white; anthers 0.8–1.5 mm.
      - 4a. Flower sessile; pyxis circumscissile at or just below middle, with (8–)12–14(–34) seeds; seeds 0.8–1.2 mm ..... 3. *P. major*
      - 4b. Flower shortly pedicellate; pyxis circumscissile near base, with (2–)5–15 seeds; seeds (1.2–)1.3–2 mm.
        - 5a. Sepals acuminate at apex, keel projecting beyond apex; anthers ca. 0.8 mm ..... 5. *P. cavaleriei*
        - 5b. Sepals obtuse or acute at apex, keel not projected at apex; anthers 1–1.5 mm.
          - 6a. Petiole not winged at middle; corolla lobes narrowly triangular; anthers 1–1.2 mm ..... 4. *P. asiatica*
          - 6b. Petiole broadly winged; corolla lobes ovate to broadly ovate; anthers ca. 1.5 mm ..... 6. *P. gentianoides*
    - 2b. Plant with a taproot.
      - 7a. Leaf blade broadly ovate to elliptic, veins 7–11; petiole retrorsely pubescent; stamens adnate to near base of corolla tube.
        - 8a. Plants turning black when dry; petiole longer than or equaling blade, not winged; bracts glabrous ..... 1. *P. maxima*
        - 8b. Plants not turning black when dry; petiole much shorter than blade, winged; bracts pubescent ..... 2. *P. media*
      - 7b. Leaf blade obovate, elliptic, lanceolate, or linear, veins 1–5(or 7); petiole with patent, appressed upward, or rarely entangled trichomes; stamens adnate to middle of corolla tube or more apically.
        - 9a. Corolla tube pubescent or lobes hirsute-villous outside.

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- 10a. Leaf blade papery, sparsely villous; corolla lobes densely hirsute-villous outside; stamens adnate to near apex of corolla tube ..... 20. *P. lagocephala*
- 10b. Leaf blade leathery, sparsely strigillose or glabrous; corolla tube pubescent; stamens adnate to middle of corolla tube ..... 21. *P. maritima*
- 9b. Corolla glabrous.
- 11a. Lower sepals connate to near apex; stamens adnate to middle of corolla tube ..... 16. *P. lanceolata*
- 11b. All sepals distinct; stamens adnate to or near apex of corolla tube.
- 12a. Bracts with linear to subulate apex, much longer than flower ..... 17. *P. aristata*
- 12b. Bracts with obtuse or acute apex, shorter, equaling, or slightly longer than flower.
- 13a. Leaf blade glabrous or abaxially pubescent, vein 1; seeds 7–30 per pyxis, fusiform.
- 14a. Bracts broadly ovate to suborbicular; sepals broadly elliptic to orbicular; pyxis with 12–30 seeds ..... 14. *P. polysperma*
- 14b. Bracts ovate; sepals obovate; pyxis with 7–15 seeds ..... 15. *P. tenuiflora*
- 13b. Leaf blade hairy on both surfaces, veins (1 or)3–7; seeds 1–4 per pyxis, ellipsoid to oblong.
- 15a. Leaf blade elliptic, ovate-lanceolate, obovate-lanceolate, or spatulate, usually more than 1 cm wide.
- 16a. Leaf blade spatulate to obovate-lanceolate, veins (3 or)5; flowers heteromorphic; corolla yellowish, lobes erect when flowers fertile; seeds 2 per pyxis, ventral surface grooved ..... 8. *P. virginica*
- 16b. Leaf blade elliptic to ovate-lanceolate, rarely obovate-elliptic, veins 5 or 7; flowers homomorphic; corolla white, lobes patent to reflexed; seeds 4 per pyxis, ventral surface flat or prominent but not grooved.
- 17a. Bracts triangular-ovate; corolla lobes 0.5–1 mm; anthers white; pyxis 4–5 mm ..... 9. *P. depressa*
- 17b. Bracts ovate-elliptic; corolla lobes 1–1.5 mm; anthers reddish brown; pyxis 2.5–3 mm ..... 10. *P. camtschatica*
- 15b. Leaf blade ± linear to narrowly lanceolate or narrowly elliptic, usually less than 1 cm wide.
- 18a. Leaf blade arachnoid or silky villous; spikes cylindric to narrowly cylindric.
- 19a. Leaf blade arachnoid, veins 1 or 3, margin entire or repand-crenate; spikes 1–2.5(–5) cm; flowers dense; anthers ca. 1.2 mm ..... 13. *P. arachnoidea*
- 19b. Leaf blade sparsely silky villous, veins 3 or 5, margin remotely and retrorsely denticulate or triangular dentate; spikes 4–10 cm; flowers usually interrupted at base; anthers ca. 2 mm ..... 12. *P. perssonii*
- 18b. Leaf blade villous or lanate; spikes capitate or ovoid at first but later shortly cylindric.
- 20a. Keel not extending to apex of sepals; seeds 3 or 4 per pyxis, black, (1–)1.5–2 mm, ventral face flat; cotyledons parallel to ventral side ..... 11. *P. komarovii*
- 20b. Keel extending to apex of sepals; seeds 1 or 2 per pyxis, yellowish brown to brown, (2–)3–4 mm, ventral face with a groove; cotyledons vertical to ventral side.
- 21a. Plants with short stems, usually branched at base; corolla lobes orbicular-ovate ..... 18. *P. ovata*
- 21b. Plants stemless; corolla lobes elliptic to narrowly ovate ..... 19. *P. minuta*

**1. *Plantago maxima*** Jussieu ex Jacquin, *Collectanea* 1: 82. 1787.

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Herbs, perennial, robust. Taproot cylindric. Leaves basal; petiole 8–20 cm, densely retrorsely pubescent; blade broadly elliptic, broadly ovate, or broadly obovate, 8–20 × 5–14 cm, thickly papery, turning black when dry, white pubescent, veins

7–11, base broadly cuneate to decurrent onto petiole, margin entire or remotely repand-crenate, apex acute to rounded. Spikes cylindric, 6–20 cm, densely flowered; peduncle 20–50 cm, pubescent; bracts narrowly ovate, slightly shorter than calyx, glabrous, keel apparent. Sepals narrowly elliptic to ovate-elliptic, 2.2–2.5 mm, glabrous, keel broad, extending to apex. Corolla white, glabrous; lobes ovate-lanceolate, 1.5–2 mm, patent to reflexed, apex acute. Stamens lilac turning black when

dry, adnate only to near base of corolla tube, exerted; anthers ovoid-ellipsoid, 1.6–1.8 mm. Pyxis ovoid, 3–4 mm, with 2–4 seeds. Seeds yellowish brown to black, ovoid to narrowly ovoid, 1.9–2.4 mm, ventral face prominent; cotyledons parallel to ventral side. Fl. Jun–Aug, fr. Aug–Sep.  $2n = 24$ .

Meadows; 500–1000 m. N Xinjiang (Altay, Yining) [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan; E Europe].

## 2. *Plantago media* Linnaeus, Sp. Pl. 1: 113. 1753.

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*Plantago media* var. *urvilleana* Rapin; *P. stepposa* Kuprianova.

Herbs, perennial. Taproot cylindrical, thick. Leaves basal; petiole 0.5–8 cm, winged, densely retrorsely pubescent; leaf blade elliptic, ovate, or obovate, 4.5–13 × 1.5–5 cm, papery to thickly papery, white pubescent, veins 7 or 9, base cuneate to attenuate, margin entire or remotely repand-crenate, apex acute. Spikes cylindrical, 3–8 cm, densely flowered; peduncle 15–40(–45) cm, white pubescent; bracts narrowly ovate, 2–3 mm, basally and adaxially pubescent, keel thick, apex subacute. Sepals as long as bract, glabrous, keel not extending to apex; lower sepals ovate-elliptic to broadly ovate; upper sepals broadly ovate. Corolla white, glabrous; lobes ovate-elliptic to ovate, 1.7–2.3 mm, patent to reflexed. Stamens lilac turning black when dry, adnate to near base of corolla tube, exerted; anthers oblong, 1.7–1.9 mm. Pyxis ovoid-ellipsoid, 2.5–4 mm, with 2–4 seeds. Seeds yellowish brown to brown, ellipsoid, 1.5–2 mm, shiny, ventral face prominent; cotyledons parallel to ventral side. Fl. Jun–Aug, fr. Jul–Sep.  $2n = 12^*$ , 24.

Meadows, wet banks, ravines, mountain slopes, terraces; 1400–2000 m. Nei Mongol, Xinjiang [Kazakhstan, Kyrgyzstan, Russia (Far East, Siberia); SW Asia, Europe].

## 3. *Plantago major* Linnaeus, Sp. Pl. 1: 112. 1753.

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*Plantago gigas* H. Léveillé; *P. intermedia* Gilibert; *P. jehohlensis* Koidzumi [“*jepohlensis*”]; *P. macronipponica* Yamamoto; *P. major* var. *gigas* (H. Léveillé) H. Léveillé; *P. major* subsp. *intermedia* (Gilibert) Lange; *P. major* var. *jehohlensis* (Koidzumi) S. H. Li; *P. major* var. *kimurae* Yamamoto; *P. major* var. *paludosa* Béguinot; *P. major* var. *pauciflora* (Gilibert) Béguinot; *P. major* subsp. *pletosperma* Pilger; *P. major* var. *sawadae* Yamamoto; *P. major* var. *sinuata* (Lamarck) Decaisne; *P. pauciflora* Gilibert; *P. sawadae* (Yamamoto) Yamamoto; *P. sinuata* Lamarck; *P. villifera* Kitagawa (1935), not Franchet (1879).

Herbs, perennial. Roots numerous, fibrous. Leaves basal, pubescent to subglabrous; petiole 1–10(–26) cm; leaf blade broadly ovate to broadly elliptic, 3–18(–30) × 2–11(–21) cm, herbaceous to papery, veins (3 or)5 or 7, base cuneate, subrounded, or cordate, ± decurrent onto petiole, margin remotely dentate to subentire, apex acute to obtuse. Spikes narrowly cylindrical to cylindrical, 1–20(–40) cm, usually interrupted basally; peduncle 2–18(–45) cm, pubescent; bracts broadly ovate-triangular, 1.2–2 mm, glabrous or pubescent at apex, keel broad and

thick. Flowers sessile. Sepals 1.5–2.5 mm, glabrous or ciliate, keel not extending to apex, apex rounded; lower sepals elliptic to broadly elliptic; upper sepals broader. Corolla white, glabrous; lobes narrowly ovate, 1–1.5 mm, patent to reflexed. Stamens adnate only to near base of corolla tube, exerted; anthers purplish or white, ellipsoid, 1–1.2 mm. Pyxis subglobose, ovoid, or broadly ellipsoid, 2–3 mm, circumscissile at or just below middle, with (8–)12–24(–34) seeds. Seeds yellowish brown, ovoid, ellipsoid, or rhomboid, 0.8–1.2 mm, angled, ventral face prominent to slightly flat; cotyledons parallel to ventral side. Fl. Jun–Aug, fr. Jul–Sep.  $2n = 12, 18, 24$ .

Meadows, wet places, wastelands; near sea level to 2800 m. Anhui, Chongqing, Fujian, Gansu, Guangxi, Hainan, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Qinghai, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan [India, Nepal, Pakistan; C, N, and SW Asia, Europe].

*Plantago major* is widely naturalized throughout much of the world.

## 4. *Plantago asiatica* Linnaeus, Sp. Pl. 1: 113. 1753.

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Herbs, perennial. Roots numerous, fibrous. Leaves basal; petiole 2–15(–27) cm, sparsely pubescent; leaf blade broadly ovate to broadly elliptic, 4–12 × 2.5–6.5 cm, thinly papery to papery, sparsely pubescent, veins 3–7, base broadly cuneate to subrounded and decurrent onto petiole, margin entire, repand, serrate, or dentate, apex obtuse to acute. Spikes narrowly cylindrical, 3–40 cm, loosely to densely flowered, sometimes interrupted basally; peduncle 5–30 cm, white pubescent; bracts narrowly ovate-triangular to triangular-lanceolate, 2–3 mm, glabrous or pubescent at apex, keel thick. Sepals 2–4 mm, keel extending or not extending to apex, apex obtuse, rounded, or acute; lower sepals elliptic, keel broad; upper sepals broadly obovate-elliptic to broadly obovate. Corolla white, glabrous; lobes narrowly triangular, (0.7–)1–1.5 mm, patent to reflexed, apex acuminate to acute. Stamens adnate only to near base of corolla tube, exerted; anthers white, ovoid-ellipsoid, 1–1.2 mm. Pyxis fusiform-ovoid, ovoid, conic-ovoid, or narrowly conic-ovoid, 3–6(–8) mm, circumscissile near base, with 5–15 seeds. Seeds blackish brown, ovoid-ellipsoid to ellipsoid, 1.2–2 mm, angled, ventral face prominent to slightly flat; cotyledons parallel to ventral side. Fl. Apr–Aug, fr. Jun–Sep.

Mountain slopes, ravines, riverbanks, fields, roadsides, wastelands, lawns; near sea level to 3800 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Indonesia, Japan, Korea, Malaysia, Nepal, Sri Lanka].

Although *Plantago asiatica* and *P. erosa* (*P. asiatica* subsp. *erosa*) have sometimes been treated as synonyms of *P. major* (J. Parnell, Fl. Thailand 9(2): 153. 2008), molecular evidence does not support this (N. Rønsted et al., Bot. J. Linn. Soc. 139: 323–338. 2002; N. Ishikawa et al., Amer. J. Bot. 96: 1627–1635. 2009).

1a. Sepals 3.5–4 mm, apex acute; pyxis narrowly conic-ovoid, 5–6(–8) mm

..... 4c. subsp. *densiflora*

- 1b. Sepals 2–3 mm, apex rounded to obtuse; pyxis fusiform-ovoid, ovoid, or conic-ovoid, 3–4.5 mm.  
 2a. Leaf blade veins 5 or 7; keel not extending to apex of sepal; corolla lobes ca. 1.5 mm ..... 4a. subsp. *asiatica*  
 2b. Leaf blade veins 3(or 5); keel extending to apex of sepal; corolla lobes (0.7–)1–1.2 mm ..... 4b. subsp. *erosa*

#### 4a. *Plantago asiatica* subsp. *asiatica*

车前(原亚种) che qian (yuan ya zhong)

*Plantago asiatica* var. *brevior* Pilger; *P. asiatica* var. *densiuscula* Pilger; *P. asiatica* var. *laxa* Pilger; *P. asiatica* var. *lobulata* Pilger; *P. formosana* Tateishi & Masamune; *P. hostifolia* Nakai & Kitagawa; *P. major* Linnaeus var. *asiatica* (Linnaeus) Decaisne; *P. major* var. *folioscopia* T. Ito.

Leaf blade veins 5 or 7. Spikes loosely to densely flowered. Sepals 2–3 mm, keel not extending to apex, apex rounded to obtuse. Corolla lobes ca. 1.5 mm. Pyxis fusiform-ovoid to conic-ovoid, 3–4.5 mm, with 5 or 6(–12) seeds. Seeds (1.2–)1.5–2 mm. Fl. Apr–Aug, fr. Jun–Sep.  $2n = 12, 24, 36$ .

Mountain slopes, ravines, riverbanks, fields, roadsides, wastelands, lawns; near sea level to 3200 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Indonesia, Japan, Korea, Malaysia].

#### 4b. *Plantago asiatica* subsp. *erosa* (Wallich) Z. Yu Li, Fl. Reipubl. Popularis Sin. 70: 328. 2002.

疏花车前 shu hua che qian

*Plantago erosa* Wallich in Roxburgh, Fl. Ind. 1: 423. 1820; *P. centralis* Pilger.

Leaf blade veins 3(or 5). Spikes usually loosely flowered and interrupted. Sepals 2–2.5 mm, keel extending to apex, apex rounded to obtuse. Corolla lobes (0.7–)1–1.2 mm. Pyxis conic-ovoid, 3–4 mm, with 6–15 seeds. Seeds 1.2–1.7(–2) mm. Fl. May–Jul, fr. Aug–Sep.  $2n = 24$ .

Mountain slopes, riverbanks, ravines, fields, roadsides; 400–3800 m. Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Qinghai, Shanxi, Sichuan, Xizang, Yunnan [Bangladesh, Bhutan, India, Nepal, Sri Lanka].

#### 4c. *Plantago asiatica* subsp. *densiflora* (J. Z. Liu) Z. Yu Li, Fl. Reipubl. Popularis Sin. 70: 328. 2002.

长果车前 chang guo che qian

*Plantago densiflora* J. Z. Liu, Acta Phytotax. Sin. 27: 298. 1989 [“*densiflorus*”].

Leaf blade veins 3 or 5. Spikes densely flowered, sometimes interrupted basally. Sepals 3.5–4 mm, keel not extending to apex, apex acute. Corolla lobes 1.3–1.5 mm. Pyxis narrowly conic-ovoid, 5–6(–8) mm, with (5–)10–15 seeds. Seeds 1.2–2 mm. Fl. Jun–Aug, fr. Aug–Sep.

• Mountain slopes, roadsides; 700–3500 m. Chongqing, Guizhou, Hubei, Hunan, Xizang, Yunnan.

#### 5. *Plantago cavaleriei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 2: 114. 1906.

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*Plantago gigas* H. Léveillé var. *cavaleriei* (H. Léveillé) H. Léveillé; *P. schneideri* Pilger; *P. schneideri* var. *delicatio* Pilger.

Herbs, perennial. Roots numerous, fibrous. Leaves basal; petiole 5–12 cm; leaf blade broadly ovate to elliptic, (2.5–)3.5–10 × (1–)2–5 cm, papery, pubescent to subglabrous, veins 5(or 7), base broadly cuneate to rounded and decurrent onto petiole, margin entire, remotely serrate, or dentate, apex rounded to acute. Spikes narrowly cylindrical, 3–20 cm, usually interrupted basally; peduncle 5–25 cm, pubescent; bracts broadly ovate to broadly ovate-triangular, 1–2.3 mm, keel projecting beyond apex, apex acuminate. Sepals 2–2.8 mm, keel projected at apex, apex acuminate; lower sepals ovate-elliptic, keel broad; upper sepals broadly ovate to broadly ovate-orbicular, keel narrow and obviously projected. Corolla white, glabrous; tube slightly longer than calyx; lobes narrowly triangular, 1–1.5 mm, patent to reflexed, apex acuminate. Stamens adnate only to near base of corolla tube, exerted; anthers white, ovoid, ca. 0.8 mm. Pyxis narrowly conic-ovoid, 4–4.5 mm, circumscissile near base, with 6–9 seeds. Seeds dark brown, ovoid to ellipsoid, angled, 1.2–1.8 mm, ventral face prominent; cotyledons parallel to ventral side. Fl. May–Aug, fr. Jul–Sep.

• Wet mountain valleys, riverbanks, lake banks, roadsides; 200–3500 m. Guizhou, S Sichuan (Meigu), Yunnan.

#### 6. *Plantago gentianoides* Sibthorp & Smith subsp. *griffithii* (Decaisne) K. H. Rechinger, Fl. Iran. 15: 9. 1965.

革叶车前 ge ye che qian

*Plantago griffithii* Decaisne in A. Candolle, Prodr. 13(1): 700. 1852 [“*griffithsii*”]; *P. gentianoides* var. *laxa* Pilger; *P. gentianoides* var. *tatarica* (Decaisne) Pilger; *P. griffithii* var. *alpina* Bornmüller; *P. griffithii* var. *pamirica* Fedtschenko; *P. tatarica* Decaisne.

Herbs, perennial. Roots numerous, fibrous. Leaves basal, glabrous or sparsely pubescent when young; petiole 1–3(–4) cm, broadly winged; leaf blade thinly leathery to leathery when dry, ovate, broadly ovate, or broadly elliptic, (1–)2–6 × 1.5–2.5 cm, veins 3 or 5, base broadly cuneate to subrounded and decurrent onto petiole, margin entire, repand, or shallowly crenate below middle, apex acute to acuminate. Spikes capitate to cylindrical, 1–3 cm, densely flowered or interrupted basally; peduncle 2–10 cm, apically appressed pubescent; bracts broadly ovate to broadly ovate-triangular, 2.2–2.5 mm, glabrous, keel broad but not extending to apex. Sepals 2–2.5 mm, glabrous, keel narrower than on bract and extending to apex; lower sepals broadly obovate-elliptic to broadly elliptic; upper sepals broadly elliptic to elliptic. Corolla white turning brown when dry, glabrous; lobes ovate to broadly ovate, 1.2–1.3 mm, patent to reflexed, apex sometimes emarginate. Stamens adnate only to near base of corolla tube, exerted; anthers yellowish brown when dry, ellipsoid, ca. 1.5 mm. Pyxis ellipsoid to ovoid, apex truncate, circumscissile near base, with 2–4(–7) seeds. Seeds brown to blackish brown, ellipsoid, ca. 2 mm, angled, ventral face flat;

cotyledons parallel to ventral side. Fl. Jun–Aug, fr. Aug–Sep.  $2n = 12$ .

Riverbanks, moist stony pastures; 3000–4300 m. SW Xinjiang, NW Xizang [Afghanistan, Kashmir, Kyrgyzstan, Pakistan; SW Asia (Iran)].

*Plantago gentianoides* subsp. *gentianoides* occurs in SE Europe and differs from subsp. *griffithii* by having leaf blade ovate-lanceolate to broadly ovate, herbaceous to papery when dry, base cuneate, apex acute, and anthers yellow when dry.

**7. *Plantago fengdouensis*** (Z. E. Chao & Yong Wang) Yong Wang & Z. Yu Li, *Acta Phytotax. Sin.* 42: 558. 2004.

丰都车前 feng du che qian

*Plantago erosa* Wallich var. *fengdouensis* Z. E. Chao & Yong Wang, *J. Wuhan Bot. Res.* 20: 263. 2002.

Herbs, perennial. Roots numerous, fibrous. Leaves basal; petiole 1.5–10 cm; leaf blade lanceolate to linear-lanceolate, 4–15 × 1–4 cm, thinly papery to papery, glabrous or white pubescent near sinus between lobes, veins 3 (or 5), base narrowly cuneate to decurrent onto petiole, margin dentate to incised, each side with 1–5 triangular to linear lobes or rarely repand, apex acute to acuminate. Spikes narrowly cylindrical, 2–15 cm, densely flowered, loose or interrupted basally; peduncle 4–15 cm, glabrous; bracts ovate-triangular, 2–3 mm, apically ciliate, keel thick and extending to apex. Sepals elliptic, 2.2–2.7 mm, glabrous; lower sepals longer than upper ones, keel extending to or near apex, apex subacute to rounded. Corolla yellowish, glabrous; lobes narrowly triangular, 1.4–1.6 mm, patent to reflexed, apex acuminate. Stamens adnate only to near base of corolla tube, exserted; anthers yellow, ellipsoid-ovoid, 1.8–2.2 mm. Pyxis fusiform-ellipsoid, 3–4 mm, circumscissile just below middle, with 2 or 3 seeds. Seeds blackish brown, ellipsoid to ovoid-ellipsoid, sometimes angled, with a shallow groove on ventral face; cotyledons parallel to ventral side. Fl. Apr–May, fr. Apr–May.  $2n = 24^*$ .

• Seasonally inundated alluvial areas on islets; below 200 m. Chongqing (Banan Qu, Fengdu, Zhongxian).

*Plantago fengdouensis* is an amphibious plant with a highly restricted distribution, occurring only between 140 and 160 m on the three alluvial islets in Fengdu and Zhongxian counties and Bannan district within the Three Gorges Dam area. The natural habitats were permanently submerged by the water project in Jun 2003. The living plants are conserved at Wuhan Botanical Garden and Beijing Botanical Garden of the Chinese Academy of Sciences and were reintroduced to Fengdu in 2008.

**8. *Plantago virginica*** Linnaeus, *Sp. Pl.* 1: 113. 1753.

北美车前 bei mei che qian

Herbs, annual or winter annuals. Taproot tenuous. Leaves basal; petiole 0.5–5 cm, winged or not winged; leaf blade oblanceolate, spatulate, or obovate-lanceolate, (2–)3–18 × 0.5–4 cm, sparsely white pubescent, veins (3 or)5, base narrowly cuneate to decurrent onto petiole, margin repand, irregularly dentate, or subentire, apex acute to obtuse. Spikes narrowly cylindrical, (1–)3–18 cm, base usually interrupted; peduncle 4–20 cm, hollow, densely white pubescent. Sepals as long as or slightly shorter than bract, pubescent; lower sepals obovate, keel not extending to apex; upper sepals broadly ovate, keel narrower

and projected at apex. Corolla yellowish, glabrous; lobes ovate-lanceolate, 1.5–2.5 mm, erect to reflexed, apex acuminate. Stamens adnate to near apex of corolla tube, included or exserted; anthers yellowish, narrowly ovoid to broadly ellipsoid, 0.3–1.1 mm. Pyxis ovoid, 2–3 mm, circumscissile near base, with 2 seeds. Seeds light brown, ovoid to narrowly ovoid, (1–)1.4–1.8 mm, with a shallow groove on ventral face; cotyledons parallel to ventral side. Fl. Apr–May, fr. May–Jun.  $2n = 12, 24$ .

Naturalized in grasslands, roadsides, and lake banks; near sea level to 800 m. Anhui, Chongqing, Fujian, Guangxi, Hubei, Hunan, Jiangsu, Jiangxi, Taiwan, Zhejiang [native to North America; naturalized in Central America, Europe, and Japan].

*Plantago virginica* was first collected in China in Nanchang Shi, Jiangxi, in 1951. In China this species usually has cleistogamous cosexual flowers. Cleistogamous female flowers and chasmogamous male flowers are rare. Cleistogamous cosexual flowers have erect corolla lobes, included anthers and stigma, and narrowly ovoid ca. 0.3 mm anthers. Cleistogamous female flowers are similar to cosexual flowers but with vestigial anthers and an exserted stigma. Chasmogamous male flowers have patent to reflexed corolla lobes, exserted stamens, broadly ellipsoid 1–1.1 mm anthers, and often a vestigial ovary.

In North America *Plantago virginica* is typically cleistogamous and cosexual; however, flowers, inflorescences, or entire plants are frequently chasmogamous and functionally male or cleistogamous with exserted stigmas and functionally female.

**9. *Plantago depressa*** Willdenow, *Enum. Pl. Suppl.* 8. 1813.

平车前 ping che qian

Herbs, annual, winter annual, or perennial. Taproot long, ± fleshy or becoming woody when old. Leaves basal, sparsely or densely white pubescent; petiole 2–7 cm; leaf blade elliptic, elliptic-lanceolate, obovate-elliptic, or ovate-lanceolate, 3–15 × 1–5.5 cm, papery, veins 5 or 7, base cuneate and decurrent onto petiole, margin repand-crenate, irregularly serrate, dentate, or entire, apex acute to obtuse. Spikes narrowly cylindrical, 6–12 cm, densely flowered, interrupted basally; peduncle 5–18 cm, white pubescent; bracts triangular-ovate, 2–3.5 mm, glabrous, keel extending near or to apex. Sepals 2–2.5 mm, glabrous, keel not extending to apex; lower sepals narrowly obovate-elliptic to broadly elliptic; upper sepals obovate-elliptic to broadly elliptic. Corolla white, glabrous; lobes elliptic to ovate, 0.5–1 mm, patent to reflexed. Stamens adnate to near apex of corolla tube, exserted; anthers white, ovoid-ellipsoid to broadly ellipsoid, 0.6–1.5 mm. Pyxis ovoid-ellipsoid to conic-ovoid, 4–5 mm, circumscissile near base, with 4 seeds. Seeds yellowish brown to black, ellipsoid, 1.2–1.8 mm, ventral face prominent to slightly flat; cotyledons parallel to ventral side. Fl. May–Jul, fr. Jul–Sep.

Meadows, wet mountain slopes, riverbanks, wet places, fields, roadsides; near sea level to 4500 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, E Nei Mongol, Ningxia, Qinghai, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Afghanistan, Bhutan, India, Kashmir, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Pakistan, E Russia].

- 1a. Annuals or winter annuals; taproot ± fleshy; leaves sparsely pubescent, leaf blade 3–12 × 1–3.5 cm, margin repand-crenate, irregularly serrate, or dentate; anthers 0.6–1.1 mm ..... 9a. subsp. *depressa*

- 1b. Perennials; taproot and rootstock woody when old; leaves densely pubescent, leaf blade 9–15 × 2.5–5.5 cm, margin entire or rarely repand-crenate; anthers 0.7–1.5 mm ..... 9b. subsp. *turczaninowii*

**9a. *Plantago depressa* subsp. *depressa***

平车前(原亚种) ping che qian (yuan ya zhong)

*Plantago depressa* var. *magnibracteata* T. Tanaka & T. K. Zheng; *P. sibirica* Poiret; *P. tibetica* J. D. Hooker.

Annuals or winter annuals. Taproot ± fleshy. Leaves sparsely pubescent; leaf blade 3–12 × 1–3.5 cm, margin repand-crenate, irregularly serrate, or dentate. Anthers 0.6–1.1 mm. Fl. May–Jul, fr. Jul–Sep.  $2n = 12$ .

Meadows, fields, roadsides, wet places; near sea level to 4500 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Ningxia, Qinghai, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Afghanistan, Bhutan, India, Kashmir, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Pakistan, E Russia].

**9b. *Plantago depressa* subsp. *turczaninowii*** (Ganeschin) Tzvelev, *Arktichesk. Fl. SSSR* 8(2): 19. 1983.

毛平车前 mao ping che qian

*Plantago depressa* var. *turczaninowii* Ganeschin, *Trudy Bot. Muz. Imp. Akad. Nauk* 8: 193. 1915; *P. depressa* var. *montana* Kitagawa.

Perennials. Taproot and rootstock woody when old. Leaves densely pubescent; leaf blade 9–15 × 2.5–5.5 cm, margin entire or rarely repand-crenate. Anthers 0.7–1.5 mm. Fl. Jun–Jul, fr. Jul–Aug.

Moist meadows, wet mountain slopes, riverbanks; 1000–1500 m. N Hebei, Heilongjiang, Jilin, Liaoning, E Nei Mongol [E Mongolia, E Russia].

**10. *Plantago camtschatica*** Link, *Enum. Hort. Berol. Alt.* 1: 120. 1821.

海滨车前 hai bin che qian

*Plantago depressa* Willdenow subsp. *camtschatica* (Link) Pilger; *P. villifera* Franchet.

Herbs, perennial. Taproot long, ± fleshy. Leaves basal; petiole 1–4 cm; leaf blade narrowly elliptic to elliptic-ovate, 2.5–10 × 1–4 cm, thickly papery, densely white pubescent, veins 5 or 7, base attenuate, margin entire or repand-crenate, apex acute. Spikes cylindrical, 3–9 × 0.5–1 cm, densely white pubescent, densely flowered or interrupted basally; peduncle 6–15 cm; bracts ovate-elliptic, 2–2.5(–4) mm, usually pubescent, keel broad and not extending to apex. Sepals 2.5–3 mm, keel broad, thick, and not extending to apex; lower sepals elliptic to obovate-elliptic; upper sepals broadly elliptic to orbicular. Corolla white, glabrous; lobes ovate-elliptic to ovate, 1–1.5 mm, patent to reflexed, apex acute. Stamens adnate to near apex of corolla tube, exerted; anthers reddish brown, ellipsoid, 1–1.2 mm. Pyxis ovoid-ellipsoid to conic-ovoid, 2.5–3 mm, circumscissile near base, with 4 seeds. Seeds dark brown, ellipsoid to ovoid, 1.5–2.2 mm, ventral face flat; cotyledons parallel to ventral side. Fl. May–Jul, fr. Jun–Aug.  $2n = 12$ .

Seaside sandy areas; near sea level. Liaoning (Chang Dao) [Japan, Korea, E Russia (Far East)].

**11. *Plantago komarovii*** Pavlov, *Byull. Moskovsk. Obshch. Isp. Prir., Otd. Biol.* 38: 130. 1929.

翘柄车前 chi bing che qian

Herbs, perennial. Taproot long. Leaves basal, sparsely white villous or glabrate; petiole 0.8–1.5 cm, broadly winged; leaf blade linear-lanceolate to elliptic, 2–5 × 0.2–0.4 cm, thickly papery, veins 3, base attenuate to decurrent onto petiole, margin entire or remotely denticulate, apex acuminate. Spikes shortly cylindrical to capitate, 3–12 mm, densely flowered; peduncle 2–6 cm, sparsely appressed villous; bracts ovate to triangular-ovate, as long as or slightly longer than calyx, keel broad. Sepals 1.5–2 mm, sparsely pilose at base, keel narrow and not extending to apex; lower sepals ovate-elliptic; upper sepals broadly ovate. Corolla white, glabrous; lobes narrowly triangular, 1–1.3 mm, patent to reflexed. Stamens adnate to near apex of corolla tube, exerted. Pyxis ovoid, 2–3 mm, with 3 or 4 seeds. Seeds black, oblong to narrowly ovoid, (1–)1.5–2 mm, ventral face flat; cotyledons parallel to ventral side. Fl. May–Jun, fr. Jul–Aug.  $2n = 12$ .

Stony meadows; 2000–2500 m. N Xinjiang (Hoboksar, Jinghe) [Kazakhstan, W Mongolia].

**12. *Plantago perssonii*** Pilger in Engler, *Pflanzenr.* 102(IV. 269): 440. 1937.

莛叶车前 ju ye che qian

Herbs, perennial. Taproot more than 1 cm in diam. Leaves basal, silky villous; petiole 1–3 cm, tenuous; leaf blade lanceolate to narrowly lanceolate, 6–7 × 0.5–1 cm, papery, veins 3 or 5, base attenuate, margin remotely and retrorsely denticulate to triangular dentate, apex acuminate. Spikes narrowly cylindrical, 3–10 cm, lanate; bracts narrowly ovate-elliptic to ovate, 2–2.5 mm, keel not extending to apex. Sepals 2.2–2.5 mm, keel narrow and not extending to apex, apex pubescent; lower sepals elliptic; upper sepals broadly ovate, apex attenuate. Corolla white, glabrous; lobes ovate, 1.5–1.8 mm, patent to reflexed, apex narrow and slightly obtuse. Stamens adnate to near apex of corolla tube, exerted; anthers yellow when dry, ellipsoid, ca. 2 mm. Pyxis ovoid-ellipsoid, 3.5–4 mm, circumscissile near base, with 1 or 2 seeds. Seeds brown to blackish brown, ellipsoid, ca. 2 mm, ventral face flat; cotyledons parallel to ventral side. Fl. Jun–Jul, fr. Jul–Aug.

• Stony meadows on slopes; 2600–3200 m. SW Xinjiang (Shache, Yecheng).

**13. *Plantago arachnoidea*** Schrenk in Fischer & C. A. Meyer, *Enum. Pl. Nov.* 1: 16. 1841 [*“arachnoides”*].

蛛毛车前 zhu mao che qian

*Plantago arachnoidea* var. *lorata* J. Z. Liu; *P. lorata* (J. Z. Liu) Shipunov.

Herbs, perennial. Taproot long and thick. Leaves basal, densely arachnoid; petiole 1.5–2.5 cm; leaf blade narrowly elliptic, lanceolate, or linear, 2–8(–15) × 0.3–1.2(–1.5) cm,

papery, veins 1 or 3, base attenuate, margin entire, repand, or repand-crenate, apex acute to acuminate. Spikes cylindrical to narrowly cylindrical, 1–2.5(–5) cm, densely flowered or interrupted basally; peduncle 5–20 cm; bracts broadly ovate to ovate, 2–3 mm, margin arachnoid, keel broad and not extending to apex. Sepals as long as bract, keel not extending to apex, margin and apex arachnoid; lower sepals broadly elliptic; upper sepals broadly obovate-elliptic to orbicular. Corolla white, glabrous; lobes broadly ovate, 1–1.5 mm, patent to reflexed, apex acute. Stamens adnate to near apex of corolla tube, exerted; anthers yellow when dry, ellipsoid, ca. 1.2 mm. Pyxis ovoid to narrowly ovoid, 3–4 mm, circumscissile near base, with 1 or 2 seeds. Seeds yellowish brown to blackish brown, oblong to ellipsoid, (1.5–)1.8–2.8 mm, ventral face flat; cotyledons parallel to ventral side. Fl. Jun–Jul, fr. Jul–Aug.

Stony mountain slopes, saline habitats, meadows; 700–3500 m. Xinjiang [Kazakhstan].

**14. *Plantago polysperma*** Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 431. 1842.

多籽车前 duo zi che qian

Herbs, annual. Taproot tenuous. Leaves basal, glabrous; petiole inconspicuous; leaf blade narrowly linear to filamentous-linear, 2–10 cm × 1–2(–3) mm, thickly papery, vein 1, base attenuate, margin entire, apex slightly obtuse. Spikes cylindrical to capitate, 0.5–4 cm, elongated to 7 cm after anthesis, densely flowered or interrupted basally; peduncle 2–10 cm, sparsely white pubescent or glabrous; bracts broadly ovate to suborbicular, 1.7–2.3 mm, glabrous, keel extending to apex. Sepals 1.5–1.8 mm, glabrous, keel thin and extending to apex; lower sepals broadly elliptic; upper sepals suborbicular, keel narrow. Corolla white, glabrous; lobes ovate, ca. 1 mm, erect. Stamens adnate to near apex of corolla tube, exerted, covered with erect corolla lobes. Pyxis conic-ovoid, 3–4.5 mm, apex truncate, circumscissile near base, with 12–30 seeds. Seeds dark brown, fusiform, 1–1.5 mm; ventral face flat; cotyledons parallel to ventral side. Fl. May–Jun, fr. Jun–Jul.  $2n = 24$ .

Steppes, saline habitats, sandy areas. N Xinjiang [E Kazakhstan, W Mongolia, S Russia].

**15. *Plantago tenuiflora*** Waldstein & Kitaibel, Descr. Icon. Pl. Hung. 1: 37. 1802.

小花车前 xiao hua che qian

*Plantago bungei* Steudel; *P. pusilla* Bunge (1836), not Nuttall (1818).

Herbs, annual. Taproot tenuous. Leaves basal; petiole inconspicuous; leaf blade linear to narrowly linear, 1–13 × 0.1–0.4 cm, thickly papery, glabrous or abaxially sparsely white pubescent, vein 1, base attenuate, margin entire or remotely denticulate, apex subobtuse. Spikes capitate to narrowly cylindrical, 0.5–7 cm, densely flowered or interrupted basally from middle; peduncle 1–12 cm, white pubescent; bracts narrowly ovate to ovate, 2–3 mm, glabrous, keel extending to apex. Sepals 1.5–2 mm, glabrous, keel extending to apex; lower sepals narrowly obovate to elliptic-ovate; upper sepals obovate. Corolla white, glabrous; lobes oblong-ovate, 0.8–1 mm, erect, patent, or

flexed, apex subacute. Stamens adnate to near apex of corolla tube, usually covered by erect corolla lobes, rarely exerted; anthers ovoid, ca. 0.3 mm. Pyxis conic-ovoid, 3–4 mm, circumscissile near base, with 7–15 seeds. Seeds reddish brown to blackish brown, fusiform, 1–1.5(–2) mm, ventral face flat; cotyledons parallel to ventral side. Fl. May–Jul, fr. Jun–Aug.  $2n = 24$ .

Saline meadows, alkaline soils; ca. 200 m. N Xinjiang (Junggar Pendi) [Kazakhstan, W Mongolia, S and SW Russia; SW Asia, Europe].

**16. *Plantago lanceolata*** Linnaeus, Sp. Pl. 1: 113. 1753.

长叶车前 chang ye che qian

Herbs, perennial. Taproot long and thick. Leaves basal, glabrous or pubescent; petiole tenuous, 2–10 cm; leaf blade linear-lanceolate, lanceolate, or elliptic-lanceolate, 6–20 × 0.5–4.5 cm, papery, veins (3 or)5(or 7), base narrowly cuneate and decurrent onto petiole, margin entire or remotely denticulate, apex acuminate to acute. Spikes conic-ovoid at first but later capitate to shortly cylindrical, 1–5(–8) cm, densely flowered; peduncle 10–60 cm, 5-sulcate, appressed pubescent; bracts ovate to elliptic, 3.5–5 mm, densely hirsute, keel spatulate, apex scarious and caudate. Sepals 2–3.5 mm, abaxially usually hirsute, keel narrow and not extending to apex; lower sepals connate to near apex, broadly obovate, 2-keeled, margin with sparse trichomes; upper sepals distinct, broadly ovate. Corolla white, glabrous; lobes ovate-lanceolate, 1.5–3 mm, patent to reflexed, apex shortly acuminate. Stamens adnate to near middle of corolla tube, exerted; anthers white or yellowish, ellipsoid, 2.5–3 mm. Pyxis narrowly ovoid, 3–4 mm, circumscissile near base, with (1 or)2 seeds. Seeds brown to dark brown, narrowly ellipsoid to oblong, 2–2.6 mm, shiny, with a broad groove on ventral face; cotyledons vertical to ventral side. Fl. May–Jun, fr. Jul–Aug.  $2n = 12^*$ , 14, 24.

Seasides, meadows, boggy places, stony mountain slopes, gravel beds, sandy area, roadsides, wastelands; near sea level to 900 m. Gansu, Henan, Jiangsu, Jiangxi, Liaoning, Shandong, Taiwan, Xinjiang, Yunnan, Zhejiang [Bhutan, India, Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia, Europe, North America].

**17. *Plantago aristata*** Michaux, Fl. Bor.-Amer. 1: 95. 1803.

芒苞车前 mang bao che qian

*Plantago aristata* var. *minuta* T. K. Zheng & X. S. Wan ["*munuta*"].

Herbs, annual or winter annual. Taproot tenuous. Stem 1–4 cm, erect, obscured by leaf sheaths. Leaves spirally alternate, densely villous to glabrate; petiole, inconspicuous; leaf blade elliptic-linear to linear, 4–20 × 0.1–0.9 cm, papery, veins 3, base attenuate and decurrent onto petiole, margin entire, apex acuminate. Spikes narrowly cylindrical, (0.5–)3–10 cm, densely flowered; peduncle 10–20 cm, densely appressed villous; bracts narrowly ovate, basalmost 0.8–4 cm but reduced apically, erect to spreading, densely villous, apex with linear to subulate aristata. Sepals 2–3 mm, keel and apex densely pilose; lower sepals narrowly obovate, keel broad, thick, and not extending to apex; upper sepals ovate, keel narrow and extending to apex. Corolla yellowish, glabrous; lobes broadly ovate, 2–2.5 mm, patent to

reflexed, base nearly auriculate. Stamens adnate to near apex of corolla tube; anthers yellowish, ovoid, ca. 0.4 mm, included to slightly exerted. Pyxis ellipsoid to ovoid, 2.5–3 mm, circumscissile just below middle, with 2 seeds. Seeds brown, ellipsoid to oblong, (1.9–)2.3–2.7 mm, with a broad groove on ventral face; cotyledons vertical to ventral side. Fl. May–Jun, fr. Jun–Jul.  $2n = 20$ .

Naturalized in seaside sandy areas, wastelands, and roadsides; near sea level. Jiangsu (Suqian), Shandong (Qingdao) [native to North America; naturalized in E Asia and Europe].

*Plantago aristata* was first collected in China in Qingdao Shi in 1929.

**18. *Plantago ovata*** Forsskål, Fl. Aegypt.-Arab. 31. 1775.

圆苞车前 yuán bāo chē qián

*Plantago ispaghula* Roxburgh ex Fleming.

Herbs, annual. Taproot long and tenuous, rigid. Stem short, branched basally, internode 2–15 mm, densely white villous-lanate. Leaves spirally alternate, sparsely to densely white villous-lanate; petiole 2–5 cm, tenuous; leaf blade linear to linear-lanceolate, 3–15 cm × 1–6 mm, papery, veins 3, base attenuate and decurrent onto petiole, margin entire or remotely denticulate, apex with 1.5–5 mm subulate tip. Spikes ovoid and 0.5–2 cm at anthesis but narrowly ovoid to shortly cylindrical and to 5 cm after anthesis, densely flowered; peduncle 3–22 cm, villous-lanate; bracts broadly ovate to orbicular, 3–4 mm, usually glabrous, keel extending to or near apex. Sepals 2.5–3 mm, keel extending to or near apex; lower sepals obovate-elliptic, glabrous or pubescent; upper sepals elliptic, glabrous. Corolla white, glabrous; lobes orbicular-ovate, 2.5–2.8 mm, patent to reflexed, apex acute. Stamens adnate to near apex of corolla tube, exerted; anthers yellowish brown when dry, ovoid, 0.9–1.3 mm. Pyxis ellipsoid, 4–5 mm, circumscissile near middle, with 2 seeds. Seeds yellowish brown, ellipsoid to ovoid-ellipsoid, 2.5–3 mm, with a groove on ventral face; cotyledons vertical to ventral side. Fl. May–Jun, fr. Jun–Jul.  $2n = 8^*$ , 16.

Introduced for the medicinal seeds, locally naturalized in margins of fields or grasslands; near sea level to 1500 m. Fujian (Xiamen), Xinjiang (Moyu) [native to Mediterranean region; naturalized in C, E, and S Asia and North America].

**19. *Plantago minuta*** Pallas, Reise Russ. Reich. 3: 716. 1776.

小车前 xiǎo chē qián

*Plantago lessingii* Fischer & C. A. Meyer; *P. minuta* subsp. *lessingii* (Fischer & C. A. Meyer) Tzvelev; *P. mongolica* Decaisne.

Herbs, annual. Taproot tenuous. Leaves basal; petiole inconspicuous; leaf blade linear, narrowly lanceolate, or spatulate-linear, 3–8 × 0.2–0.8 cm, rigidly papery, veins 3, base attenuate and decurrent onto petiole, margin entire, apex acuminate. Spikes capitate to shortly cylindrical, 0.6–2 cm, densely flowered; peduncle (1–)2–12 cm, tenuous, along with rachis densely grayish to yellowish villous-lanate or sometimes glabrate; bracts broadly ovate to broadly triangular, 2.2–2.8 mm, ± villous or glabrous, keel extending to apex, apex obtuse. Sepals 2.7–3 mm, keel extending to apex, margin wide and scarious;

lower sepals elliptic to broadly elliptic; upper sepals broadly elliptic. Corolla white, glabrous; lobes elliptic to narrowly ovate, 1.4–2 mm, patent to reflexed, apex acute to erose. Stamens adnate to near apex of corolla tube, exerted to included; anthers yellow when dry, suborbicular, ca. 1 mm. Pyxis ovoid to broadly ovoid, 3.5–4(–5) mm, circumscissile near base, with 2 seeds. Seeds yellowish brown, ellipsoid-ovoid to ellipsoid, (2.5–)3–4 mm, shiny, with a broad groove on ventral face; cotyledons vertical to ventral side. Fl. Jun–Aug, fr. Jul–Sep.

Saline places, gravel beds, sandy areas, ravines, boggy places; 400–4300 m. Gansu, Nei Mongol, Ningxia, Qinghai, Shanxi, Xinjiang, Xizang [Kazakhstan, Mongolia, S and SW Russia].

**20. *Plantago lagocephala*** Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 7: 445. 1851.

毛瓣车前 máo bàn chē qián

Herbs, annual. Taproot tenuous. Leaves and inflorescences villous. Leaves basal; petiole inconspicuous; leaf blade narrowly lanceolate, lanceolate, or oblanceolate, 3–4 cm × 2–3 mm, papery, veins 3, base attenuate, margin entire, apex acuminate. Spikes ovoid to ovoid-ellipsoid, 8–10 mm but to 1.6 cm after anthesis, densely flowered; peduncle 5–12 cm; bracts broadly ovate, ca. 3 mm, keel narrow and slightly projected at apex. Sepals ca. 3 mm, villous, keel thick and not extending to apex; lower sepals lanceolate-ovate, keel as broad as or slightly narrower than lateral lamina; upper sepals very inequilateral. Corolla yellowish, glabrous except lobes; lobes triangular-ovate, ca. 1 mm, erect to patent, outside densely hirsute-villous. Stamens adnate to near apex of corolla tube; anthers yellowish when dry, broadly ellipsoid, 0.7–0.8 mm, slightly exerted. Pyxis ellipsoid, 3–3.5 mm, circumscissile just below middle, with 2 seeds. Seeds yellowish brown, narrowly ellipsoid to narrowly ovoid-ellipsoid, 2.5–3 mm, shiny, with a broad groove on ventral face; cotyledons vertical to ventral side. Fl. Apr–May, fr. May–Jun.

Stony mountain slopes, saline places, open dry pastures; ca. 200 m. N Xinjiang (Shawan) [Afghanistan, Kazakhstan, Pakistan, Tajikistan, Turkmenistan, Uzbekistan].

**21. *Plantago maritima*** Linnaeus subsp. *ciliata* Printz, Veg. Siber.-Mongol. Front. 397. 1921.

盐生车前 yán shēng chē qián

*Plantago maritima* var. *salsa* (Pallas) Pilger; *P. salsa* Pallas.

Herbs, perennial. Taproot long and thick. Leaves basal, ± strigillose; petiole inconspicuous; leaf blade linear, (4–)7–32 cm × (1–)2–8 mm, leathery, veins (1 or)3 or 5, base attenuate and decurrent onto petiole, margin entire and plane to recurved, apex long acuminate. Spikes cylindrical, (2–)5–17 cm, densely flowered or interrupted basally, rachis densely strigillose; peduncle (5–)10–30(–40) cm, white strigillose; bracts triangular-ovate to lanceolate-ovate, 2–2.5 mm, margin ciliolate, keel thick but not extending to apex, apex shortly acuminate. Sepals 2.2–3 mm, keel, margin, and apex hirsutulous, keel thick and not extending to apex; lower sepals narrowly elliptic, slightly inequilateral; upper sepals broadly elliptic. Corolla yellowish;

tube outside pubescent; lobes broadly ovate to oblong-ovate, ca. 1.5 mm, patent to reflexed, margin ciliolate. Stamens adnate to middle of corolla tube, exserted; anthers yellow when dry, ellipsoid, 1.8–2 mm. Pyxis conic-ovoid, 2.7–3 mm, with 1 or 2 seeds. Seeds yellowish brown to dark brown, ellipsoid to oblong, 1.6–2.3 mm, ventral face flat; cotyledons vertical to ventral side. Fl. Jun–Jul, fr. Jul–Aug.  $2n = 12$ .

Salt marshes, saline meadows; 100–3800 m. Gansu, Hebei, Nei Mongol, Qinghai, Shanxi, Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, Russia (S Siberia); SW Asia].

*Plantago maritima* subsp. *maritima* occurs in Europe and differs from subsp. *ciliata* by having the margin of the corolla lobes glabrous.

**22. *Plantago arenaria*** Waldstein & Kitaibel, Descr. Icon. Pl. Hung. 1: 51. 1802.

对叶车前 *dui ye che qian*

*Plantago indica* Linnaeus; *P. psyllium* Linnaeus, nom. utique rej. prop.; *Psyllium arenarium* (Waldstein & Kitaibel) Mirbel; *P. indicum* (Linnaeus) Mirbel.

Herbs, annual. Taproot tenuous. Stems, leaves, inflorescences, and sepals white glandular pubescent. Stem erect, (10–) 20–60 cm tall, branched, internode elongate. Leaves cauline, opposite, seldom in whorls of 3; petiole inconspicuous; leaf blade linear to linear-lanceolate, 3–6(–8) cm × 1–4(–5) mm, papery, veins (1 or) 3, base decurrent onto petiole, margin entire,

apex acuminate. Inflorescences arising from leaf axil apically from middle of stem; spikes ovoid to ellipsoid, 0.7–2 cm, densely flowered; peduncle 2–8 cm; basalmost bracts 0.5–2 cm but reduced apically, base orbicular-ovate, apex cuspidate. Sepals broadly veined, keel broad and not extending to apex; lower sepals obovate, 3–4 mm, inequilateral; upper sepals narrowly elliptic, 2.7–3.5 mm. Corolla brownish, glabrous; tube transversely rugose; lobes narrowly ovate, 1.5–2 mm, patent to reflexed. Stamens adnate to near apex of corolla tube, exserted; anthers yellow, ellipsoid, 1.8–2.2 mm. Pyxis ellipsoid, 3.2–3.5 mm, circumscissile near base, with 2 seeds. Seeds brown to blackish brown, ovoid-ellipsoid to ellipsoid, 2.5–2.8 mm, shiny, with a broad groove on ventral face; cotyledons vertical to ventral side. Fl. Jul–Aug, fr. Aug–Oct.  $2n = 12$ .

Cultivated for its medicinal seeds, locally naturalized in sandy areas, meadows, and roadsides; 100–3500 m. Guangxi, Hebei, Jiangsu, Liaoning, Sichuan, Xinjiang, Xizang, Zhejiang [native to N Africa, SW Asia, Europe, Kazakhstan, Kyrgyzstan, Russia (W Siberia), and Tajikistan; naturalized in Australia, India, Japan, North America, and Pakistan].

Editors' note. The name *Plantago indica* Linnaeus (Syst. Nat., ed. 10, 2: 896. 1759) has been considered to be a nomenclaturally superfluous and therefore illegitimate renaming of *P. psyllium* Linnaeus (Sp. Pl. 1: 115. 1753). When a proposal to reject *P. psyllium* (Applequist, Taxon 55: 235–236. 2006) was considered by the Nomenclature Committee for Vascular Plants (Brummitt, Taxon 58: 281. 2009), rejection as proposed was recommended but the Committee also voted that *P. indica* is a legitimate name.