

155. CARAGANA Fabricius, Enum., ed. 2, 421. 1763.

锦鸡儿属 *jin ji er shu*

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Shrubs or very rarely small trees. Stipules small, caducous or persistent and spinelike. Leaves paripinnate with rachis often extending beyond last leaflet pair or rachis reduced and leaves apparently digitate, 4–20-foliolate; petiole and rachis persistent or caducous, when persistent often becoming woody and spinelike; leaflet blades with margin entire, apex often cuspidate. Flowers axillary, usually solitary but sometimes 2–5 in a fascicle. Pedicel articulate; bracteoles absent or 1 to many. Calyx tubular or campanulate; teeth 5, adaxial 2 usually smaller, base saccate or not. Corolla yellow, rarely purple, pinkish, or white; standard sometimes pale yellow or orangish red; wings and keel often auriculate. Stamens diadelphous (9+1). Ovary sessile, rarely with a distinct carpodium; ovules many. Legume cylindrical or compressed, sessile or rarely stipitate.

About 100 species: temperate Asia, E Europe; 66 species (32 endemic) in China.

This genus is planted as an ornamental, as a hedge row, for soil and water conservation, for fuels, and for sand-dune stabilization.

- 1a. Leaves digitate, 4-foliolate.
 - 2a. Leaves on short branchlets subsessile; calyx tube 4–7 mm; claw of corolla wings shorter than limb.
 - 3a. Branches yellowish white, yellow, or golden yellow.
 - 4a. Ovary glabrous; legume 3–3.5 cm, glabrous; plants to 150 cm tall 43. *C. leucophloea*
 - 4b. Ovary densely pubescent; legume 2–3 cm, pubescent when young but glabrescent; plants to 50 cm tall 44. *C. pygmaea*
 - 3b. Branches whitish green, grayish green, yellowish green, dark gray, greenish brown, yellowish brown, brown, or dark brown.
 - 5a. Leaflet blades narrowly obovate to oblanceolate, 2–3 mm wide; auricle of corolla wings 1/5–1/4 as long as claw 45. *C. altaica*
 - 5b. Leaflet blades lanceolate, lanceolate-linear, or linear, 0.5–2 mm wide; auricle of corolla wings longer.
 - 6a. Leaflet blades falcate; legume 2.5–4 cm 46. *C. aurantiaca*
 - 6b. Leaflet blades straight; legume 2–2.5 cm.
 - 7a. Leaflet blades dark green but abaxially tinged ± reddish; auricle of corolla wings ca. 2/3 as long as claw 47. *C. pumila*
 - 7b. Leaflet blades green to grayish green; auricle of corolla wings 1/4–1/2 as long as claw.
 - 8a. Corolla 1.1–1.2 cm; pedicel ca. 5 mm, articulate basally; stipule spines 1–4 mm on long branchlets 48. *C. versicolor*
 - 8b. Corolla 0.8–1.8(–2) cm; pedicel 5–10 mm, articulate slightly basally from middle; stipule spines 4–7 mm on long branchlets 49. *C. stenophylla*
- 2b. Leaves on short branchlets petiolate (but petiole as short as 1 mm in some species and absent in *C. brachypoda*); calyx tube 6–13 mm; claw of corolla wings as long as or shorter than limb.
 - 9a. Calyx tube saccate or gibbous.
 - 10a. Corolla 2.7–3.2 cm; calyx tube 1.2–1.3 cm 50. *C. kirghisorum*
 - 10b. Corolla 2–2.5(–2.8) cm; calyx tube 0.6–1.1 cm.
 - 11a. Leaflet blade apices acute.
 - 12a. Pedicel 2–5 mm, articulate basally; leaflet blades oblanceolate 51. *C. brachypoda*
 - 12b. Pedicel 5–12 mm, articulate apically; leaflet blades linear-oblanceolate 52. *C. kansuensis*
 - 11b. Leaflet blade apices rounded, truncate, or emarginate.
 - 13a. Legume densely villous; corolla 2.5–2.8 cm; standard obovate-oblong; bark dark brown; branchlets grayish brown 53. *C. leveillei*
 - 13b. Legume glabrous; corolla 2–2.5 cm; standard broadly obovate; bark grayish brown; branchlets bright gray 54. *C. opulens*
 - 9b. Calyx tube not or only slightly enlarged (but gibbous in *C. camilloi-schneideri*).
 - 14a. Corolla pinkish to reddish at least when wilted; standard oblong-obovate 55. *C. rosea*
 - 14b. Corolla yellow (but some species with an orange spot in middle of standard and some reddish yellow inside); standard broader (obovate, broadly obovate, ovate, broadly ovate, suborbicular, or orbicular).
 - 15a. Young ovary or both young ovary and young legume pubescent.
 - 16a. Corolla 1.5–1.8 cm; auricle of corolla wings 1/2–2/3 as long as claw 56. *C. qingheensis*
 - 16b. Corolla 2–3.1 cm; auricle of corolla wings 1/3–2/5 as long as claw.
 - 17a. Corolla 2.8–3.1 cm 57. *C. camilloi-schneideri*
 - 17b. Corolla 2–2.2 cm.
 - 18a. Pedicel 2–6 mm 60. *C. polourensis*
 - 18b. Pedicel 6–20 mm.

- 19a. Leaflet blades obovate to oblanceolate, both surfaces densely pubescent 58. *C. licentiana*
 19b. Leaflet blades obovate-cuneate, only abaxial surface sparsely pubescent 59. *C. shensiensis*
- 15b. Ovary and legume glabrous (ovary rarely with trichomes in *C. laeta*).
 20a. Corolla 2.6–3.5 cm 65. *C. laeta*
 20b. Corolla 1.3–2.3 cm.
 21a. Corolla standard suborbicular; pedicel 9–21 mm 66. *C. frutex*
 21b. Corolla standard obovate, broadly obovate, or broadly ovate; pedicel 2–8 mm.
 22a. Legume 1–2.5(–3.5) cm; corolla 1.4–1.6 cm 61. *C. brevifolia*
 22b. Legume 3–4.5 cm; corolla 1.6–2.3 cm.
 23a. Auricle of corolla wings nearly as long as claw; standard broadly obovate, apex emarginate 62. *C. chinghaiensis*
 23b. Auricle of corolla wings 1/5–1/3 as long as claw; standard ovate or obovate, apex obtuse.
 24a. Leaflet blades 6–13 mm; legume 3–4 mm in diam. 63. *C. densa*
 24b. Leaflet blades 4–6 mm; legume 4–6 mm in diam. 64. *C. turfaniensis*
- 1b. Leaves all pinnate or only pinnate on long branchlets and digitate on short branchlets, 4–20-foliolate.
 25a. All leaves 4-foliolate.
 26a. Leaves on long branchlets pinnate but on short branchlets sessile and digitate; claw of corolla wings ca. 1/3 as long as limb, auricle ± as long as claw 1. *C. dasyphylla*
 26b. Leaves on long and short branches pinnate or sometimes digitate or only on short branches sometimes digitate; claw of corolla wings ca. 1/2 as long as limb, auricle short and obtuse.
 27a. Corolla 2.8–3 cm; calyx tube 1.2–1.4 cm; apical pair of leaflets larger than others 2. *C. sinica*
 27b. Corolla 2.2–2.5 cm; calyx tube 0.6–0.8 cm; leaflets all of equal size 3. *C. ussuriensis*
- 25b. Leaves 4–20-foliolate (at least some leaves on plant with more than 4 leaflets).
 28a. Short branchlets with digitate or pinnate leaves and 4-foliolate, long branchlets with pinnate leaves and 4–8-foliolate.
 29a. Old branches yellow; legume densely villous 4. *C. tragacanthoides*
 29b. Old branches yellowish brown, reddish brown, or greenish brown; legume glabrous or pilose.
 30a. Leaflet blades 1.5–2(–3) cm 5. *C. spinosa*
 30b. Leaflet blades 0.3–1.2 cm.
 31a. Flowers solitary or 2 or 3 in a fascicle; calyx tube 1–1.3 cm; corolla standard suborbicular 6. *C. pruinosa*
 31b. Flowers solitary or to 4 in a fascicle; calyx tube 0.8–1 cm; corolla standard broadly ovate to oblong-obovate 7. *C. erinacea*
- 28b. All branches with pinnate leaves and 4–20-foliolate.
 32a. Petiole and rachis caducous (only often caducous in *C. boisii*, rarely persistent in *C. turkestanica*).
 33a. Calyx tube campanulate (campanulate-tubular in *C. zahlbruckneri*, tubular to broadly campanulate in *C. manshurica*), length and width nearly equal; leaflet blades often longer than 1 cm.
 34a. Flowers usually in pairs on a peduncle, rarely solitary; leaves 4–8-foliolate; ovary sericeous 27. *C. soongorica*
 34b. Flowers solitary (or 2 in a fascicle in *C. zahlbruckneri*, rarely 2 in a fascicle in *C. fruticosa* and *C. manshurica*, to 3 in a fascicle in *C. boisii*, to 5 in a fascicle in *C. arborescens*); leaves 8–20-foliolate; ovary pubescent or glabrous (densely sericeous in *C. stipitata*).
 35a. Ovary and legume stipitate 28. *C. stipitata*
 35b. Ovary and legume not stipitate.
 36a. Pedicel 0.8–1.5 cm.
 37a. Leaves 10–18-foliolate; current-year branchlets reddish brown; corolla 2.3–2.5 cm 29. *C. zahlbruckneri*
 37b. Leaves 8–12-foliolate; current-year branchlets greenish brown; corolla 1.6–1.9 cm 30. *C. fruticosa*
 36b. Pedicel 1–5 cm.
 38a. Flowers solitary or 2–5 in a fascicle.
 39a. Corolla 1.6–2 cm; spinelike stipules 5–10 mm; trees 2–6 m tall 31. *C. arborescens*
 39b. Corolla 2–2.5 cm; spinelike stipules 8–15 mm; shrubs to 1.3 m tall 32. *C. boisii*
 38b. Flowers solitary (rarely 2 in a fascicle in *C. manshurica*).
 40a. Leaves 10–20-foliolate; limb of corolla keel ± cuneate 33. *C. manshurica*
 40b. Leaves 6–10-foliolate; limb of corolla keel not cuneate 34. *C. turkestanica*
- 33b. Calyx tube campanulate or tubular, length longer than width; leaflet blades often shorter than 1 cm.
 41a. Ovary and legume stipitate.
 42a. Legume falcately curved; old branches brown and glaucous; leaflets, pedicels, and current-year branchlets with dense trichomes, not glabrescent, glaucous 35. *C. davazamcii*
 42b. Legume straight; old branches bright yellow and not glaucous; leaflets, pedicels, and current-year branchlets pubescent, glabrescent, not glaucous 36. *C. purdomii*
- 41b. Ovary and legume not stipitate.
 43a. Ovary and legume densely pubescent 37. *C. pekinensis*

- 43b. Ovary and legume glabrous, rarely sparsely pubescent.
- 44a. Spinelike stipules 10–13 mm; claw of corolla wings ca. 1/3 as long as limb; leaflet blades glabrous 38. *C. litwinowii*
- 44b. Spinelike stipules 1.5–7 mm; claw of corolla wings ca. 1/2 as long to almost as long as limb; leaflet blades with trichomes (sometimes glabrous in *C. microphylla*).
- 45a. Leaflet blades obovate, obovate-oblong, or rarely almost elliptic, apex obtuse, truncate, or emarginate; legume cylindric, 4–5 cm × 4–5 mm.
- 46a. Stipules usually obliquely erect; leaflet blades obovate to obovate-oblong, apex obtuse to truncate; ovary often glabrous 39. *C. microphylla*
- 46b. Stipules ± deflexed hooklike; leaflet blades obovate to rarely almost elliptic, apex emarginate; ovary sparsely appressed pubescent 40. *C. potaninii*
- 45b. Leaflet blades lanceolate to narrowly oblong or elliptic to obovate-elliptic, apex acute, obtuse, rounded, or rarely truncate; legume lanceolate to oblong-lanceolate, 2–3.5 cm × 5–7 mm.
- 47a. Legume 2.5–3.5 cm × 5–6 mm; leaflet blades whitish green, both surfaces villous 41. *C. liouana*
- 47b. Legume 2–2.5 cm × 6–7 mm; leaflet blades whitish, both surfaces densely appressed sericeous 42. *C. korshinskii*
- 32b. Petiole and rachis persistent and spinelike at least on long branchlets.
- 48a. Spinelike petiole and rachis persistent on long branchlets but caducous on short branchlets.
- 49a. Leaves 4–10-foliolate 8. *C. acanthophylla*
- 49b. Leaves 8–18-foliolate.
- 50a. Leaflet blades obovate-lanceolate, apex acuminate; calyx tube 1–1.5 cm 9. *C. crassispina*
- 50b. Leaflet blades obovate-oblong, oblong, or elliptic, apex obtuse or acute; calyx tube 0.8–1.2 cm.
- 51a. Leaflet blade apices obtuse to acute; flowers solitary or in pairs on a peduncle; calyx tube dark brown; corolla standard emarginate at apex; wings with 1 auricle 10. *C. bicolor*
- 51b. Leaflet blade apices obtuse; flowers solitary, rarely in pairs on a peduncle; calyx tube yellowish brown; corolla standard either slightly emarginate or not at apex; wings with 2 auricles 11. *C. franchetiana*
- 48b. Spinelike petiole and rachis persistent on both long and short branchlets.
- 52a. Corolla rosy, reddish purple, bright purple, pink, or white; calyx tube 1.4–1.7 cm 12. *C. jubata*
- 52b. Corolla yellow (yellowish white with reddish claws in *C. chumbica*, yellow but standard sometimes purple in *C. roborovskiyi*); calyx tube 0.7–1.5 cm (to 2.1 cm in *C. pleiophylla*).
- 53a. Corolla standard villous on both surfaces 13. *C. chumbica*
- 53b. Corolla standard glabrous on both surfaces.
- 54a. Ovary glabrous or nearly so.
- 55a. Leaflet blades lanceolate to oblanceolate, 8–15 × 3–6 mm; legume lanceolate to narrowly obovoid 14. *C. kozlowii*
- 55b. Leaflet blades elliptic, 5–7 × 2–3 mm; legume cylindric 25. *C. tekesiensis*
- 54b. Ovary distinctly pubescent.
- 56a. Corolla wings narrowly cuneate, auricle short to inconspicuous.
- 57a. Standard oblong; calyx tubular, ca. 1 cm; leaves 6(or 8)-foliolate; leaflet blades oblong, apex acute; plant densely white villous 15. *C. cuneatoalata*
- 57b. Standard suborbicular; calyx campanulate, ca. 1.7 cm; leaves 8–10-foliolate; leaflet blades elliptic-obovate, apex blunt; plant densely fulvous villous 16. *C. aliensis*
- 56b. Corolla wings not cuneate, with a distinct auricle.
- 58a. Legume inside glabrous.
- 59a. Leaves (4 or)6-foliate, apical pair often largest 23. *C. tangutica*
- 59b. Leaves 6–14-foliate, all nearly equal.
- 60a. Leaf rachis 1–2.5 cm; calyx tube 10–12 mm; auricle of corolla wings slightly shorter than claw 24. *C. roborovskiyi*
- 60b. Leaf rachis 2–3(–6.5) cm; calyx tube 7–10 mm; auricle of corolla wings only ca. 1 mm and much shorter than claw 26. *C. changduensis*
- 58b. Legume inside with trichomes.
- 61a. Leaf rachis glaucous and glabrous or whitish pubescent 17. *C. leucospina*
- 61b. Leaf rachis neither glaucous nor whitish pubescent.
- 62a. Shrubs less than 30 cm tall; claw of corolla wing as long as or longer than limb.
- 63a. Shrubs cushion-shaped; leaflet blades linear, 8–12 mm; flowers subsessile; legume 0.7–0.8 cm 18. *C. tibetica*
- 63b. Shrubs caespitose but not cushion-shaped; leaflet blades oblong-elliptic, 4–5 mm; flowers with a 5–7 mm pedicel; legume 1.5–2 cm 19. *C. aegacanthoides*
- 62b. Shrubs more than 40 cm tall; claw of corolla wing shorter than limb.

- 64a. Pedicel 5–7 mm; calyx 1.5–2.1 cm; legume 3–3.5 cm 20. *C. pleiophylla*
 64b. Pedicel 2–4 mm; calyx 1–1.3 cm; legume 1.5–2.5 cm.
 65a. Leaves (4 or)6- or 8(or 10)-foliolate; leaflet blades elliptic to obovate, pubescent on both surfaces; claw of corolla keel shorter than limb; legume lanceolate to narrowly ovoid 21. *C. gerardiana*
 65b. Leaves 8–12-foliolate; leaflet blades oblong, narrowly oblong, or obovate-oblong, pubescent only on abaxial surface; claw of corolla keel longer than limb; legume cylindric 22. *C. junatovii*

1. *Caragana dasyphylla* Pojarkova in Komarov, Fl. URSS 11: 400. 1945.

粗毛锦鸡儿 *cu mao jin ji er*

Shrubs to 30 cm tall. Bark grayish brown to bright brown. Leaves 4-foliolate, pinnate on long branchlets, digitate and sessile on short branchlets; petiole 0.8–1.5 cm on long branchlets, persistent; leaflet blades oblanceolate to obovate, 3–12 × 2–3 mm, both surfaces appressed pubescent, base cuneate, apex rounded to truncate. Flowers solitary. Pedicel 2–4 mm, articulate basally. Calyx tube tubular-campanulate, 6–7 mm. Corolla yellow, 1.6–1.8 cm; standard suborbicular to broadly ovate; wings with claw ca. 1/3 as long as limb, auricle ± as long as claw; keel claw ca. 1/2 as long as limb, auricle small. Ovary glabrous. Legume cylindric, 2–3.5 cm, glabrous. Fl. Apr–May, fr. Jun–Jul.

- Valleys, riverbanks, slopes; 1200–2800 m. Xinjiang.

2. *Caragana sinica* (Buc'hoz) Rehder, J. Arnold Arbor. 22: 576. 1941.

锦鸡儿 *jin ji er*

Robinia sinica Buc'hoz, Pl. Nouv. Decouv. 24. 1784; *Caragana chamlagu* Lamarck; *C. longiunguiculata* C. W. Chang; *C. rosea* Turczaninow ex Maximowicz var. *longiunguiculata* (C. W. Chang) Y. X. Liou.

Shrubs to 2 m tall. Bark dark brown. Current-year branchlets glabrous. Leaves pinnate or sometimes digitate, 4-foliolate; petiole and rachis 0.7–1.5(–2.5) cm, caducous or persistent; leaflet blades obovate to oblong-obovate, 1–3.5 × 0.5–1.5 cm, apical pairs often largest, apex rounded and mucronate. Flowers solitary. Pedicel ca. 1 cm, articulate at middle. Calyx tube campanulate, 1.2–1.4 cm. Corolla yellow, 2.8–3 cm; standard narrowly obovate, claw short; wings basally auriculate, claw nearly as long as limb; keel broadly blunt. Ovary glabrous. Legume cylindric, 3–3.5 cm. Fl. Apr–May, fr. Jul. $2n = 16, 24$.

Mountain hills; below 400–1800 m. Anhui, Fujian, S Gansu, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Sichuan, Yunnan, Zhejiang [Korea; cultivated and naturalized in Japan].

3. *Caragana ussuriensis* (Regel) Pojarkova in Komarov, Fl. URSS 11: 395. 1945.

乌苏里锦鸡儿 *wu su li jin ji er*

Caragana frutescens Linnaeus var. *ussuriensis* Regel, Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, 4(1): 44. 1862.

Shrubs to 2 m tall. Bark dark brown. Current-year branchlets brown, glabrous. Leaves pinnate, on short branchlets sometimes digitate, 4-foliolate; petiole and rachis 2–15 mm, often caducous; leaflet blades oblong-obovate to oblanceolate, 10–17 × 4–7 mm, base cuneate, apex rounded to mucronate. Flowers solitary or rarely 2 in a fascicle. Pedicel 1.2–2 cm, articulate apically from middle. Calyx tube campanulate, 6–8 × 4–5 mm. Corolla yellow, later becoming reddish; standard narrowly obovate, 2.2–2.5 cm, apex slightly emarginate; wings with claw ca. 1/2 as long as limb, auricle small and obtuse; keel claw ca. 1/2 as long as limb, auricle small. Ovary glabrous. Legume 3–3.5 cm, slightly compressed. Fl. May–Jun, fr. Jul–Aug. $2n = 16, 48$.

Hillsides; below 100 m. SE Heilongjiang [Russia (Far East)].

4. *Caragana tragacanthoides* (Pallas) Poiret in Lamarck, Encycl., Suppl. 2: 90. 1811.

中亚锦鸡儿 *zhong ya jin ji er*

Robinia tragacanthoides Pallas, Nova Acta Acad. Sci. Imp. Petrop. Hist. Acad. 10: 371. 1797; *Caragana hololeuca* Bunge ex Komarov.

Shrubs to 1 m tall. Old branches yellow. Leaves pinnate on long branchlets and 4- or 6-foliolate, pinnate or digitate on short branchlets and 4-foliolate; petiole and rachis 0.8–2.5 cm, arched to spreading, and persistent on long branchlets, 5–12 mm and persistent or caducous on short branchlets; leaflet blades narrowly oblanceolate to elliptic-lanceolate, 6–12(–15) × (1.5–)2–4 mm. Flowers solitary. Pedicel 2.5–4 mm, articulate basally. Calyx tube tubular, 1–1.2 cm. Corolla yellow, 2–2.2 cm; standard obovate, claw ± as long as limb; wings with claw ± as long as limb, auricle ca. 1/2 as long as or slightly shorter than claw; keel claw ± as long as limb, auricle short. Ovary densely pubescent. Legume cylindrical, 1.2–2.5(–3) cm, densely villous. Fl. May, fr. Jul.

Rocky slopes in mountains, scrub in mixed steppes; 700–1300 m. Xinjiang [Kazakhstan, Mongolia, Russia].

Only the typical variety occurs in China. *Caragana tragacanthoides* var. *himalaica* Komarov occurs in Kashmir and Nepal, but its taxonomic status is uncertain.

Plants misidentified as *Caragana bongardiana* (Fischer & C. A. Meyer) Pojarkova in FRPS (42(1): 35. 1993) belong here.

5. *Caragana spinosa* (Linnaeus) Hornemann, Hort. Bot. Hafn. 2: 694. 1815.

多刺锦鸡儿 duo ci jin ji er

Robinia spinosa Linnaeus, Mant. Pl. 2: 269. 1771.

Shrubs to 50 cm tall. Old branches yellowish brown; branchlets reddish brown, pubescent when young. Leaves clustered, pinnate and 6-foliolate on long branchlets, digitate and 4-foliolate on short branchlets; petiole 2–3 mm or absent; rachis 1–5 cm and persistent on long branchlets; leaflet blades narrowly oblanceolate to linear, 1.5–2(–3) cm × 2–4 mm, appressed pubescent. Flowers solitary or 2 in a fascicle. Pedicel 2–4 mm, articulate basally. Calyx tube tubular, 7–10 mm. Corolla yellow, 2–2.2 cm; standard obovate, claw 3–4 mm, apex obtuse; wings with claw ± as long as limb, scarcely auricled; keel claw ± as long as limb, auricle absent, apex acute. Ovary glabrous. Legume 2–2.5 cm × 3–4 mm, glabrous. Fl. Jun–Jul, fr. Sep. $2n = 32$.

Hillsides, riversides, bottomlands; 1200–1300 m. Xinjiang [Kazakhstan, Mongolia, Russia (Siberia)].

6. *Caragana pruinosa* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 265. 1909.

粉刺锦鸡儿 fen ci jin ji er

Shrubs to 1 m tall. Old branches greenish brown to yellowish brown; current-year branchlets brown, pubescent when young. Leaves pinnate on long branchlets and 4- or 6-foliolate, digitate on short branchlets and 4-foliolate; petiole and rachis 1–2 cm and persistent on long branchlets, 3–7 mm and caducous on short branchlets; leaflet blades oblanceolate to obovate-lanceolate, 5–10 × 1–3 mm, apex acute to obtuse. Flowers solitary or to 3 in a fascicle. Pedicel 2–3 mm, articulate basally. Calyx tube tubular, 1–1.3 cm. Corolla yellow; standard suborbicular, 2.2–2.7 cm, claw narrow; wings linear, claw ± as long as limb, auricle ca. 1 mm; keel scarcely auriculate, apex acute to rounded. Ovary pilose or rarely glabrous. Legume cylindrical,

1.5–2 cm, pilose or rarely glabrous. Fl. May, fr. Jul.

Dry hillsides; 1900–3100 m. Xinjiang [Kazakhstan, Kyrgyzstan].

7. *Caragana erinacea* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 268. 1909.

川西锦鸡儿 chuan xi jin ji er

Caragana maximovicziana Komarov; *C. spinifera* Komarov.

Shrubs to 60 cm tall. Old branches greenish brown; current-year branchlets yellowish brown to reddish brown. Leaves pinnate on long branches and 4–8-foliolate, digitate on short branches and 4-foliolate; petiole and rachis 1.5–2 cm and persistent on long branchlets, 2–15 mm and persistent or caducous on short branchlets; leaflet blades linear-oblanceolate to obovate-oblong, 3–12 × 1–2.5 mm, abaxially pilose, adaxially glabrous, apex acute. Flowers solitary or to 4 in a fascicle. Pedicel very short, appressed pubescent or glabrous. Calyx tube tubular, 8–10 mm. Corolla yellow but standard sometimes reddish purple, 1.8–2.5 cm; standard broadly ovate to oblong-obovate; wings with claw ± as long as limb, auricle very small; keel with claw longer than limb. Ovary glabrous or sparsely to densely pubescent. Legume 1.5–2 cm, glabrous or pilose. Fl. May–Jun, fr. Jul–Sep. $2n = 16^*$, 32^* .

• Forest margins, slopes in grasslands, riverbanks, sand dunes; 2000–4600 m. Gansu, Ningxia, Qinghai, W Sichuan, Xizang, NW Yunnan.

8. *Caragana acanthophylla* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 311. 1909.

刺叶锦鸡儿 ci ye jin ji er

Caragana acanthophylla subsp. *macrocalyx* Yakovlev; *C. arcuata* Y. X. Liou.

Shrubs to 1.5 m tall. Bark dark gray. Current-year branchlets bright brown. Leaves pinnate, 4–10-foliolate; petiole and rachis 1.5–4 cm, persistent on long branchlets, caducous on short branchlets; leaflet blades obovate, narrowly obovate, or oblong, 4–12 × 3–5 mm, glabrous or appressed pubescent, apex obtuse. Flowers solitary, very rarely 2 in a fascicle. Pedicel 1–2.5 cm, articulate apically or basally from middle. Calyx tube campanulate-tubular, 6–10 mm. Corolla yellow, 2.6–3 cm; standard broadly ovate; wings oblong, claw 1/3–1/2 as long as limb, auricle dentiform; keel with claw ca. 3/4 as long as limb, auricle small. Ovary glabrous. Legume 2–3 cm, glabrous. Fl. Apr–May, fr. Jul. $2n = 16$.

Hillsides, river valleys, sandy areas; 1000–1300 m. Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

Caragana arcuata is known only from the type, and it is obviously related to *C. acanthophylla*. The type specimen is depauperate, with only a few leaflets remaining and with a branch probably from the lower part of an old stem. A field study has not found any materials to support this species, thus it is treated here as a synonym of *C. acanthophylla*.

9. *Caragana crassispina* C. Marquand, J. Linn. Soc., Bot. 48: 170. 1929.

粗刺锦鸡儿 *cu ci jin ji er*

Shrubs to 1.2 m tall. Leaves pinnate, ca. 10-foliolate; petiole and rachis 4–7 cm × ca. 2 mm, persistent on long branchlets, caducous on short branchlets; leaflet blades obovate-lanceolate, 7–15 × 5–7 mm, abaxially pubescent, apex acuminate. Flowers solitary. Calyx tube tubular-campanulate, 1–1.5 cm, base subgibbous. Corolla bright yellow but standard yellow to orangish yellow; standard suborbicular, ca. 2.5 cm; wings bright yellow, limb ca. 12 × 4–6 mm, auricle curved and slightly longer than claw; keel with a broad auricle. Ovary densely villous. Legume linear, ca. 3 cm, densely villous. Fl. Jun–Jul, fr. Aug–Sep. $2n = 16$.

Woodlands, scrub; 2900–3100 m. Xizang [Nepal].

10. *Caragana bicolor* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 299. 1909.

二色锦鸡儿 *er se jin ji er*

?*Caragana limprichtii* Harms.

Shrubs to 3 m tall. Old branches grayish brown to dark gray; current-year branchlets brown. Leaves pinnate, 8–16-foliolate; petiole and rachis 1.5–5 cm, persistent on long branchlets, caducous on short branchlets; leaflet blades obovate-oblong to elliptic, 3–8 × 2–4 mm, appressed pubescent when young but later only abaxially pilose, apex obtuse to acute. Flowers solitary or in pairs on a peduncle. Pedicel 1–2 cm, articulate near middle. Calyx tube dark brown, campanulate, 0.8–1.2 cm. Corolla yellow but standard violet-purple when dry, 2–2.2 cm; standard obovate, claw ca. 1/2 as long as limb, apex emarginate; wings with claw shorter than limb, auricle 1, slender, and slightly shorter than claw; keel with a claw ± as long as limb, auricle dentiform and small. Ovary densely pubescent. Legume cylindrical, 3–4 cm, outside pilose, inside densely pubescent, apex acuminate. Fl. Jun–Jul, fr. Sep–Oct. $2n = 16^*$.

• Slopes, scrub in mixed forests; 2400–3600 m. W Sichuan, E Xizang, NW Yunnan.

Caragana limprichtii from E Xizang may be conspecific with this species but needs to be studied further.

11. *Caragana franchetiana* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 300. 1909.

云南锦鸡儿 *yun nan jin ji er*

Shrubs to 3 m tall. Old branches grayish brown; young branchlets brown. Leaves pinnate, 10–18-foliolate; petiole and rachis 2–5 cm, persistent on long branchlets, caducous on short branchlets; leaflet blades obovate-oblong to oblong, 5–9 × 3–3.5 mm, pubescent when young, apex obtuse. Flowers solitary or rarely in pairs on a peduncle. Pedicel 0.5–2 cm, articulate basally from middle. Calyx tube yellowish brown, tubular, 0.8–1.2 cm, base gibbous. Corolla yellow but standard sometimes purple; standard suborbicular to obovate, ca. 2.3 cm, apex emarginate or not; wings with claw slightly shorter than limb, auricles 2, basal auricle ± as long as claw, apical auricle dentiform or ca. 5 mm; keel with claw ± as long as limb, apex

obtuse, auricle dentiform. Ovary densely pubescent. Legume cylindrical, 2–4.5(–5) cm, outside appressed pubescent, inside brown tomentose. Fl. May–Jun, fr. Jul–Aug. $2n = 16^*$.

• Slopes, forest margins; 2800–4000 m. SW and W Sichuan, Xizang, N and NW Yunnan.

- 1a. Corolla standard suborbicular, apex not emarginate; wings with apical auricle dentiform 11a. var. *franchetiana*
- 1b. Corolla standard obovate, apex slightly emarginate; wings with apical auricle ca. 5 mm 11b. var. *gyirongensis*

11a. *Caragana franchetiana* var. *franchetiana*

云南锦鸡儿(原变种) *yun nan jin ji er* (yuan bian zhong)

Caragana gerardiana Benth. var. *glabrescens* Franchet; ?*C. oreophila* W. W. Smith.

Corolla standard suborbicular, apex not emarginate; wings with apical auricle dentiform.

• Slopes in scrub, under trees at forest margins; 2800–4000 m. SW and W Sichuan, Xizang, N and NW Yunnan.

Caragana oreophila from NW Yunnan may be conspecific with this species but needs to be studied further.

11b. *Caragana franchetiana* var. *gyirongensis* (C. C. Ni) Y. X. Liou, Fl. Reipubl. Popularis Sin. 42(1): 25. 1993.

吉隆锦鸡儿 *ji long jin ji er*

Caragana gyirongensis C. C. Ni, Acta Phytotax. Sin. 18: 367. 1980; *C. jilungensis* C. C. Ni.

Corolla standard obovate, apex slightly emarginate; wings with apical auricle ca. 5 mm.

• Mountain slopes; ca. 2900 m. Xizang (Gyirong).

12. *Caragana jubata* (Pallas) Poiret in Lamarck, Encycl., Suppl. 2: 89. 1811.

鬼箭锦鸡儿 *gui jian jin ji er*

Shrubs 0.3–2 m tall. Bark dark brown, dark gray, or grayish brown. Leaves pinnate, 8–12-foliolate; petiole and rachis 5–7 cm, persistent; leaflet blades oblong, 11–15 × 4–6 mm, base rounded, apex rounded to acute. Flowers solitary. Pedicel ca. 0.5 mm, articulate basally. Calyx tube tubular, 1.4–1.7 cm. Corolla rosy, reddish purple, bright purple, pink, or white, 2.5–3.9 cm; standard broadly ovate; wings oblong, claw 2/3–3/4 as long as limb, auricles 1 or 2 and linear, subulate, or triangular. Ovary villous. Legume to 3 cm, densely villous. Fl. Jun–Jul, fr. Aug–Sep. $2n = 16$.

Slopes, forest margins; 2400–4700 m. Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, N Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, N Yunnan [Bhutan, India (Sikkim), Mongolia, Nepal, E Russia].

The distribution of this species is wide. The morphological characters are variable and are found under several varieties.

- 1a. Corolla wings with auricle on claw; flowers reddish purple 12d. var. *recurva*

- 1b. Corolla wings with auricle on limb; flowers rosy.
 2a. Corolla wings with 1 auricle 12a. var. *jubata*
 2b. Corolla wings with 2 auricles.
 3a. Corolla wings with auricles subulate to triangular 12b. var. *czetyrkiniinii*
 3b. Corolla wings with auricles linear 12c. var. *biaurita*

12a. *Caragana jubata* var. *jubata*

鬼箭锦鸡儿(原变种) *gui jian jin ji er (yuan bian zhong)*

Robinia jubata Pallas, Nova Acta Acad. Sci. Imp. Petrop. Hist. Acad. 10: 370. 1797; *Caragana jubata* f. *seczuanica* Komarov.

Corolla rosy; wings with 1 auricle on limb. $2n = 16$.

Slopes, forest margins; 2400–4700 m. Gansu, Hebei, W Nei Mongol, Ningxia, Qinghai, N Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, N Yunnan [Bhutan, India (Sikkim), Mongolia, Nepal, E Russia].

12b. *Caragana jubata* var. *czetyrkiniinii* (Sanchir) Y. X. Liou, Acta Phytotax. Sin. 22: 214. 1984.

浪麻鬼箭 *lang ma gui jian*

Caragana czetyrkiniinii Sanchir, Bot. Zhurn. (Moscow & Leningrad) 59: 232. 1974; *C. forrestii* Sanchir.

Corolla wings with 2 auricles, basal auricle linear and slightly shorter than claw, apical auricle subulate to triangular and 1–2 mm.

• Slopes; 3800–4400 m. Qinghai, Xizang, NW Yunnan.

12c. *Caragana jubata* var. *biaurita* Y. X. Liou, Acta Phytotax. Sin. 22: 214. 1984.

两耳鬼箭 *liang er gui jian*

Leaflet blades 5–7 mm wide. Corolla 3.6–3.9 cm; wings with 2 auricles, longest auricle linear and 2–6 mm.

• Slopes; 3000–4700 m. Hebei (Zhuolu), Nei Mongol, Ningxia, Qinghai, S Xinjiang.

12d. *Caragana jubata* var. *recurva* Y. X. Liou, Acta Phytotax. Sin. 22: 214. 1984.

弯耳鬼箭 *wan er gui jian*

Corolla reddish purple, ca. 2.5 cm; wings with auricle on claw and recurved.

• Slopes; 2700–4600 m. Gansu, Ningxia, Qinghai, W Sichuan, E Xizang.

13. *Caragana chumbica* Prain, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 66: 370. 1897.

高山锦鸡儿 *gao shan jin ji er*

Caragana alpina Y. X. Liou.

Shrubs to 1.5 m tall. Old branches dark brown to yellowish brown; current-year branchlets densely villous. Leaves pinnate, 6-foliolate; petiole and rachis 2.5–6 cm, persistent, densely villous when young; leaflet blades linear to narrowly lanceolate, 12–16 × 2–3 mm, villous on both surfaces, apex

acute. Flowers solitary. Pedicel 3–4 mm, articulate basally. Calyx tube campanulate-tubular, ca. 8 mm. Corolla yellowish white but petal claws reddish, 2.4–2.5 cm; standard suborbicular, both surfaces villous, claw ca. 1/2 as long as limb; wings with claw ca. 2/5 as long as limb, auricles 2, basal auricle slightly longer than claw, apical auricle triangular to dentiform; keel with claw slightly shorter than limb, auricle not prominent. Ovary densely villous. Legume 2–3 cm, densely villous. Fl. Jun, fl. Jul.

Rocky slopes of alpine mountains; 4600–5000 m. S Xizang [India (Sikkim), Nepal].

Treated as a synonym of *Caragana jubata* by Grierson and Long (Fl. Bhutan 1(3): 713. 1987), this species may just represent a high-elevation form of *C. jubata*.

14. *Caragana kozlowii* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 283. 1909.

沧江锦鸡儿 *cang jiang jin ji er*

Caragana tangutica Maximowicz var. *yushuensis* Y. H. Wu.

Shrubs to 1.5 m tall. Old branches grayish brown to brown. Leaves pinnate, (4 or 6)(or 8)-foliolate; petiole and rachis 2–4 cm, persistent; leaflet blades lanceolate to oblanceolate, 8–15 × 3–6 mm, apex acute. Flowers solitary. Pedicel 1–6 mm, articulate basally. Calyx tube tubular-campanulate, 0.9–1.3 cm. Corolla yellow, (1.7–)2–2.3 cm; standard oblong-obovate, claw short, apex rounded; wings with claw as long as limb, auricle ca. 2 mm; keel with claw slightly longer than limb. Ovary glabrous. Legume lanceolate to narrowly ovoid, 2.5–3.5 cm, glabrous. Fl. May–Jul, fr. Aug–Sep.

• River basins, slopes; 3100–4300 m. S Qinghai, E Xizang.

According to the original diagnosis, the leaves have six or eight leaflets, but in the specimens we have seen, the leaflets are never more than six.

15. *Caragana cuneatoalata* Y. X. Liou, Acta Phytotax. Sin. 22: 212. 1984.

楔翼锦鸡儿 *xie yi jin ji er*

Shrubs to 2 m tall. Old branches bright brown; current-year branchlets villous. Leaves pinnate, 6(or 8)-foliolate; petiole and rachis 2.5–3.5 mm, persistent; leaflet blades oblong, 7–10 × 2–3 mm, both surfaces villous, apex acute. Flowers solitary. Pedicel very short. Calyx tube tubular-campanulate, ca. 1 cm. Corolla 2.7–2.8 cm; standard oblong; wings cuneate, claw ca. 1/2 as long as limb, auricle inconspicuous; keel with claw slightly longer than limb. Ovary densely villous. Legume unknown. Fl. Jul–Aug.

• Slopes, river valleys; ca. 4700 m. Xizang.

This species is dubious in that it is known only from the type specimen.

16. *Caragana aliensis* Y. Z. Zhao, Kew Bull. 63: 345. 2008.

阿里锦鸡儿 *a li jin ji er*

Shrubs. Bark gray-brown; branches short and crowded together, cinereous. Stipules rufous, ovate, membranous,

densely fulvous villous. Leaves paripinnate, 8–10-foliolate; rachis persistent, rigid to springy, 2–4 cm; leaflet blades yellowish green, elliptic-obovate, 6–10 × 3–5 mm, both surfaces densely fulvous villous, apex blunt. Flowers solitary, sessile. Calyx campanulate, ca. 1.7 × 0.7 cm, densely fulvous villous; lobes triangular, ca. 6 mm. Corolla yellow; standard ca. 2.7 cm, limb nearly orbicular ca. 1.8 cm in diam., gradually narrowed at base to claw; wings ca. 2.6 cm, wider in upper part, claw ca. 1/2 as long as limb, auricle short, linear, incurved, ca. 1 mm; keel ca. 2.4 cm, claw slightly shorter than limb, auricle short, tooth-like. Ovary densely fulvous villous outside, glabrous inside. Legume unknown.

- Hillsides. Xizang (Zanda).

Caragana aliensis seems to be related to *C. aegacanthoides*, but whether the former species should be recognized or not requires further study. This treatment is based on the protologue; we have not seen the type specimen (at NWBI).

17. *Caragana leucospina* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 281. 1909.

白刺锦鸡儿 *bai ci jin ji er*

Shrubs to 1 m tall. Bark yellowish gray. Leaves pinnate, 6–8-foliolate; petiole and rachis ca. 3 cm, persistent, glaucous, glabrous or white pubescent; leaflet blades narrowly elliptic to oblong-lanceolate, (5–)10–16(–17) × 2–4.5(–5) mm, densely pubescent, apex rounded. Flowers solitary. Pedicel 4–6 mm, articulate basally. Calyx tube broadly tubular, ca. 1.3 cm. Corolla yellow, 2.5–3 cm; standard obovate, claw narrow; wings oblong, auricle shortly linear; keel base nearly truncate. Ovary densely pubescent. Legume 2–2.5 cm, outside pubescent, inside with trichomes. Fl. Jun, fr. Jul.

Slopes; 1200–2500 m. Xinjiang [Kyrgyzstan].

18. *Caragana tibetica* (Maximowicz ex C. K. Schneider) Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 282. 1909.

毛刺锦鸡儿 *mao ci jin ji er*

Caragana tragacanthoides (Pallas) Poiret var. *tibetica* Maximowicz ex C. K. Schneider, Ill. Handb. Laubholz. 2: 100. 1907; *C. ordosica* Y. Z. Zhao, Zong Y. Zhu & L. Q. Zhao.

Shrubs to 30 cm tall, cushion-shaped. Old branches grayish yellow to grayish brown; current-year branchlets bright grayish brown, densely pubescent. Leaves pinnate, 6- or 8-foliolate; petiole and rachis 2–3.5 cm, persistent, densely pubescent when young; leaflet blades linear, 8–12 × 0.5–1.5 mm, densely villous, apex acute. Flowers solitary, subsessile. Calyx tube tubular, 0.8–1.5 cm. Corolla yellow, 2.2–2.5 cm; standard obovate, claw ca. 1/2 as long as limb, apex slightly emarginate; wings with claw as long as or slightly longer than limb; keel with claw slightly longer than limb, auricle dentiform. Ovary densely pubescent. Legume ellipsoid, 7–8 mm, outside pubescent, inside tomentose. Fl. May–Jul, fr. Jul–Aug. $2n = 16$.

Dry slopes, sandy areas; 1400–3500 m. Gansu, W Nei Mongol, Ningxia, Qinghai, N Shaanxi, W Sichuan, Xizang [Mongolia].

Y. Z. Zhao et al. (Bull. Bot. Res., Harbin 25: 385. 2005) believed that *Caragana ordosica* differs from this taxon by having leaflet blades involute, thus tubular in cross section, and auricle of corolla wings

obtuse. However, from the general morphology, we believe it is conspecific with *C. tibetica*.

19. *Caragana aegacanthoides* (R. Parker) L. B. Chaudhary & S. K. Srivastava, Taiwania 52: 31. 2007.

萨迦锦鸡儿 *sa jia jin ji er*

Astragalus aegacanthoides R. Parker, Indian Forester 49: 78. 1923; *Caragana sajaensis* C. C. Ni.

Shrubs 6–10 cm tall, caespitose. Bark grayish yellow, glabrous. Branches short and dense, pubescent. Leaves pinnate, (6–)12- or 14(or 16)-foliolate; petiole and rachis 3–8 cm, persistent, densely pubescent when young, later glabrescent; leaflet blades oblong-elliptic, 4–5 × ca. 2 mm, both surfaces pubescent, apex emarginate to truncate. Flowers solitary. Pedicel 5–7 mm. Calyx tube tubular, 1–1.2 cm, pubescent. Corolla yellow, 2–2.4 cm; standard ovate-oblong, 2.2–2.4 cm, claw ca. 1/2 as long as limb, apex emarginate; wings with limb ca. 1.2 cm, claw distinctly longer than limb; keel with claw distinctly longer than limb, auricle short. Ovary densely pubescent. Legume oblong-ellipsoid, 1.5–2 cm, outside densely pubescent or when mature glabrescent, inside with trichomes. Fl. Jun–Jul, fr. Jul–Aug.

Valleys in grasslands or meadows; 4000–4800 m. S Xizang [N India].

20. *Caragana pleiophylla* (Regel) Pojarkova in Komarov, Fl. URSS 11: 401. 1945.

多叶锦鸡儿 *duo ye jin ji er*

Caragana tragacanthoides (Pallas) Poiret var. *pleiophylla* Regel, Izv. Imp. Obsc. Ljubit. Estestv. Moskovsk. Univ. 34(2): 19. 1882.

Shrubs to 1 m tall. Old branches yellowish brown; branchlets pubescent. Leaves pinnate, 8–14-foliolate; petiole and rachis 1.5–4(–5.5) cm, persistent; leaflet blades oblong to obovate-oblong, 6–12 × 3–4 mm, both surfaces appressed pubescent when young, base broadly cuneate, apex acute. Flowers solitary. Pedicel 5–7 mm, articulate basally. Calyx tube narrowly tubular, 1.5–2.1 cm. Corolla yellow, 3–3.6 cm; standard elliptic-ovate, claw 1/3–1/2 as long as limb, apex slightly emarginate; wings with claw ca. 2/3 as long as limb, auricle 2/5–1/2 as long as claw and often with an additional apical 1–2 mm auricle; keel with claw ± as long as limb. Ovary densely pubescent. Legume tubular, 3–3.5 cm, outside pubescent, inside with trichomes. Fl. May, fr. Jun–Jul. $2n = 16$.

Rocky slopes, river terraces; 1500–2500 m. Xinjiang [Kazakhstan, Kyrgyzstan, Uzbekistan].

Yakovlev (Rast. Tsentral. Azii 8a: 35. 1988) considered this taxon to be synonymous with *Caragana roborovskiyi*, but it differs from *C. roborovskiyi* by its wing auricle 1/3–1/2 as long as limb, standard elliptic-obovate, calyx 1.5–2.1 cm, and corolla 3–3.6 cm. The latter has wing auricle nearly as long as limb, standard obovate, calyx 1–1.2 cm, and corolla 2.3–2.7 cm.

21. *Caragana gerardiana* Benth in Royle, Ill. Bot. Himal. Mts. 198. 1835.

印度锦鸡儿 *yin du jin ji er*

Shrubs to 1 m tall. Old branches yellowish brown to gray; branchlets reddish brown, villous. Leaves pinnate, (4 or)6- or 8(or 10)-foliolate; petiole and rachis 1.5–3.5 cm, persistent, densely tomentose; leaflet blades elliptic to obovate, 5–10 × 2–5 mm, both surfaces tomentose, base cuneate, apex rounded to obtuse. Flowers solitary or sometimes 2 in a fascicle. Pedicel 2–4 mm, articulate basally. Calyx tube tubular, 1–1.3 cm. Corolla yellow, 2.3–2.5 cm; standard broadly obovate, claw ca. 1/3 as long as limb, apex emarginate to rounded; wings with claw slightly shorter than limb, auricle shortly dentiform; keel with a claw shorter than limb, auricle orbicular. Ovary tomentose. Legume lanceolate to narrowly ovoid, 1.5–2 cm, turgid, outside and inside tomentose. Fl. May–Jul, fr. Jul–Aug. $2n = 16, 18$.

Slopes in scrub; 3700–4200 m. S Qinghai, W Xizang [Afghanistan, NW India, Kashmir, Nepal, Pakistan; SW Asia].

22. *Caragana junatovii* Gorbunova, *Novosti Sist. Vyssh. Rast.* 21: 89. 1984.

通天河锦鸡儿 *tong tian he jin ji er*

Shrubs 40–50 cm tall. Old branches grayish brown; branchlets reddish brown, sparsely villous. Leaves pinnate, 8–12-foliolate; petiole and rachis 2.5–3.5 cm on short branchlets, 3.5–4.5 cm on long branchlets, persistent, villous when young; leaflet blades oblong, narrowly oblong, or obovate-oblong, 6–8 × 3–4 mm, abaxially pilose, apex obtuse to acute. Flowers solitary. Pedicel 2–3 mm. Calyx tube tubular, 1–1.2 cm, pubescent. Corolla yellow; standard obovate, ca. 2.5 cm, apex emarginate; wings as long as standard, claw ca. 3/5 as long as limb, auricle ca. 1/2 as long as claw; keel ca. 2.1 cm, claw longer than limb. Ovary white pubescent. Legume cylindrical, 1.5–2 cm, outside densely pubescent to glabrescent, inside tomentose. Fl. Jun, fr. Jun–Jul.

- Sunny slopes; 3800–4100 m. SW Qinghai.

Plants misidentified as “*Caragana przewalskii*” in FRPS (42: 33. 1993) belong here. Although treated in FRPS, “*C. przewalskii*” is an invalid name that is synonymous with *C. roborovskiyi* (see comment under that species).

23. *Caragana tangutica* Maximowicz in Komarov, *Trudy Imp. S.-Peterburgsk. Bot. Sada* 29: 286. 1909.

青甘锦鸡儿 *qing gan jin ji er*

Caragana leduensis Y. Z. Zhao, Y. H. Wu & L. Q. Zhao.

Shrubs to 4 m tall. Bark exfoliating in sheets. Old branches greenish brown. Leaves pinnate, (4 or)6-foliolate; petiole and rachis 1.5–4 cm, persistent; leaflet blades oblanceolate to oblong-ovate, 8–15 × 3–8 mm, with apical pair often largest, abaxial surface and margin villous, apex acute. Flowers solitary. Pedicel 0.8–1.5 cm, articulate basally. Calyx tube campanulate-tubular, 0.8–1.3 cm. Corolla yellow, 2.3–2.7 cm; standard obovate, apex emarginate; wings with claw slightly shorter than limb, auricle linear and 1/2–3/4 as long as claw; keel with claw ca. 3/4 as long as limb. Ovary densely pubescent. Legume linear, 3–4 cm, outside appressed pubescent, inside glabrous. Fl. May–Jun, fr. Jul–Sep. $2n = 16^*$.

- Shrubby slopes, sunny slopes, woodlands; 2000–4000 m. Gan-

su, S Ningxia, Qinghai, W Sichuan.

24. *Caragana roborovskiyi* Komarov, *Trudy Imp. S.-Peterburgsk. Bot. Sada* 29: 280. 1909.

荒漠锦鸡儿 *huang mo jin ji er*

Shrubs to 1 m tall. Branches yellowish brown, pubescent when young. Leaves pinnate, 6–12-foliolate; petiole and rachis 1–2.5 cm, persistent; leaflet blades broadly obovate to oblong, 4–10 × 3–5 mm, all equal in size, densely pubescent, apex rounded to acute. Flowers solitary. Pedicel ca. 4 mm, articulate near middle to basally. Calyx tube tubular, 1.1–1.2 cm. Corolla yellow but standard sometimes purple; standard obovate, 2.3–2.7 × 1.2–1.3 cm; wings with claw ca. 1/2 as long as limb, auricle linear and slightly shorter than claw; keel with claw ± as long as limb, auricle obtuse and small. Ovary densely pubescent. Legume cylindrical, 2.5–3 cm, outside white villous, inside glabrous. Fl. May, fr. Jun–Jul. $2n = 16^*$.

- Dry slopes, valleys, sunny areas, loess hills; 1200–3100 m. Gansu, W Nei Mongol, Ningxia, E Qinghai, Xinjiang.

“*Caragana przewalskii*” (Pojarkova in Komarov, *Fl. URSS* 11: 353. 1945) belongs here but was not validly published because no Latin description or diagnosis was provided (*Vienna Code*, Art. 36.1).

25. *Caragana tekesiensis* Y. Z. Zhao & D. W. Zhou, *Bull. Bot. Res.*, Harbin 10(2): 83. 1990.

特克斯锦鸡儿 *te ke si jin ji er*

Shrubs to 1 m tall. Branches grayish yellow, pubescent when young. Leaves pinnate, 6–12-foliolate; petiole and rachis 1.5–3 cm, persistent, pubescent when young; leaflet blades elliptic, 5–7 × 2–3 mm, densely pubescent. Flowers solitary or to 3 in a fascicle. Pedicel ca. 4 mm, articulate basally. Calyx tube tubular-campanulate, 1–1.5 cm. Corolla yellow; standard broadly oblanceolate to narrowly obovate, 1.5–2 × 0.6–0.8 cm; wings with claw ca. 1/4 as long as limb, auricle linear and slightly shorter than claw; keel auricle small, dentiform, apex obtuse. Ovary glabrous or nearly so. Legume cylindrical, 2.5–4 × ca. 0.4 cm, glabrous. Fl. Jun, fr. Jul.

- Dry slopes; 1200–2000 m. Xinjiang (Tekes, Zhaosu).

26. *Caragana changduensis* Y. X. Liou, *Acta Phytotax. Sin.* 22: 212. 1984.

昌都锦鸡儿 *chang du jin ji er*

Shrubs to 2 m tall. Old branches yellowish brown to grayish brown. Leaves pinnate, 10–14-foliolate; petiole and rachis tender, 2–3(–6.5) cm, persistent; leaflet blades ovate-oblong to oblong, 5–7 × ca. 2.5 mm, all equal in size, both surfaces pubescent, apex acute. Flowers solitary. Pedicel 2–3 mm, articulate basally. Calyx reddish brown; tube tubular, 7–10 mm. Corolla yellow, 2.2–2.3 cm; standard obovate, apex ± rounded; wings with claw longer than 1/2 to slightly shorter than limb, auricle ca. 1 mm; keel with claw longer than limb, auricle inconspicuous. Ovary densely pubescent. Legume lanceolate, ca. 2.5 cm, outside pubescent, inside glabrous. Fl. Jun, fr. Jul–Aug.

- Slopes in scrub, riverbanks; 3100–4300 m. S Qinghai, NW Sichuan, Xizang.

Y. Z. Zhao (Acta Sci. Nat. Univ. Intramongol. 24: 648. 1993) and Y. H. Wu (Fl. Qinghai. 2: 182. 1999) considered this species to be synonymous with *Caragana gerardiana* because the inner side of the fruits of this taxon, with or without trichomes, overlaps with those of *C. gerardiana*. This needs further study.

27. *Caragana soongorica* Grubov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 19: 543. 1959.

准噶尔锦鸡儿 zhun ga er jin ji er

Shrubs to 2 m tall. Branches dark gray to purplish black. Leaves pinnate, 4–8-foliolate; petiole and rachis 1.5–4.5 cm, caducous; leaflet blades obovate, 7–15 × 5–9 mm, both surfaces glabrous or abaxially appressed pubescent, apex slightly emarginate to truncate. Flowers usually in pairs or very rarely 1-flowered on a peduncle. Pedicel 1–3.5 cm, articulate apically from middle. Calyx tube campanulate, 7–9 mm. Corolla yellow, 3–3.5 cm; standard broadly ovate, claw ca. 1 cm; wings with claw ca. 1/2 as long as limb, auricle linear and 2–3 mm; keel 3–5 mm shorter than wings, claw ca. 4/5 as long as limb. Ovary sericeous to glabrescent. Legume 4–5.5 cm. Fl. May, fr. Jul–Aug.

• Slopes in scrub, river terraces; 900–1800 m. Xinjiang.

28. *Caragana stipitata* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 343. 1909.

柄荚锦鸡儿 bing jia jin ji er

Caragana reticulata Rehder; *C. sericea* Pampanini ex Komarov.

Shrubs to 2 m tall. Branches dark grayish brown to bright brown. Leaves pinnate, 8–12-foliolate; petiole and rachis 3–7 cm, caducous; leaflet blades oblong, elliptic, or ovate-lanceolate, 1.5–2(–2.8) × 0.7–1(–1.5) cm, densely sericeous when young. Flowers solitary. Pedicel 0.6–1.5 cm, articulate apically from middle. Calyx tube campanulate, 5–7 mm. Corolla yellow, 1.3–1.5 cm; standard rhombic to broadly ovate, claw ca. 1/3 as long as limb; wings with claw ± as long as limb, auricle ca. 1/3 as long as claw; keel with claw slightly longer than limb, auricle spurlike. Ovary densely sericeous, with a carpodium. Legume lanceolate, 2.5–3 cm, stipe nearly as long as to slightly longer than calyx. Fl. Apr–May, fr. Jun–Jul.

• Slopes, valleys, shrubby forest margins; 1000–2100 m. E Gansu, W Henan, Shaanxi, S Shanxi.

29. *Caragana zahlbruckneri* C. K. Schneider, Ill. Handb. Laubholzk. 2: 96. 1907.

南口锦鸡儿 nan kou jin ji er

Shrubs to 1.5 m tall. Branches brownish black to greenish brown; current-year branchlets reddish brown. Leaves pinnate, 10–18-foliolate; petiole and rachis 3–8 cm, caducous; leaflet blades obovate-oblong, oblanceolate, or narrowly oblanceolate, 6–18 × 4–6 mm, nearly glabrous to appressed pubescent, apex rounded to obtuse. Flowers solitary or 2 in a fascicle. Pedicel 0.8–1.5 cm, articulate at or apically from middle. Calyx tube campanulate-tubular, 7–8 mm. Corolla yellow; standard obovate to suborbicular, 2.3–2.5 cm, claw short; wings with claw slightly longer than or equal to limb, auricle dentiform; keel

with claw slightly longer than limb, auricle inconspicuous. Ovary glabrous. Legume 4–4.5 cm, glabrous. Fl. May, fr. Jul.

• Slopes in scrub; 500–1900 m. N Hebei, S Heilongjiang, NW Shanxi.

30. *Caragana fruticosa* (Pallas) Besser, Cat. Hort. Cremenecei, 116. 1816.

极东锦鸡儿 ji dong jin ji er

Robinia altagana Pallas var. *fruticosa* Pallas, Fl. Ross. 1: 69. 1784.

Shrubs to 2 m tall. Branches grayish green-brown; current-year branchlets greenish brown. Leaves pinnate, 8–12-foliolate, long petiolate; petiole and rachis 2.5–4 cm, caducous; leaflet blades oblong, 10–15 × 4–6 mm, glabrous, apex sometimes emarginate. Flowers solitary or rarely 2 in a fascicle. Pedicel 0.8–1.2 cm, articulate apically. Calyx tube campanulate, 5–6 mm. Corolla bright yellow, 1.6–1.9 cm; standard rhombic to broadly ovate, claw ca. 1/4 as long as limb, apex slightly emarginate; wings oblong, claw ca. 1/2 as long as limb, auricle dentiform; keel with claw nearly as long as limb. Ovary glabrous. Legume cylindric, 3–3.5 cm. Fl. Jun, fr. Jul. *2n* = 16.

Slopes in scrub; below 100–1800 m. Heilongjiang [Korea, E Russia].

31. *Caragana arborescens* Lamarck, Encycl. 1: 615. 1785.

树锦鸡儿 shu jin ji er

Robinia caragana Linnaeus, Sp. Pl. 2: 722. 1753; *Caragana fruticosa* (Pallas) Besser var. *multiflora* H. Xie & Y. T. Zhao; *C. sibirica* Medikus.

Trees or large shrubs, 2–6 m tall. Branches dark gray; branchlets green to yellowish brown. Stipules spinelike, 5–10 mm. Leaves pinnate, 8–16-foliolate; petiole and rachis 3–7 cm, caducous; leaflet blades oblong-obovate to elliptic, 1–2(–2.5) × 0.5–1(–1.3) cm, pubescent when young or only abaxially pubescent, base mostly rounded or rounded-cuneate, apex obtuse. Flowers solitary or to 5 in a fascicle. Pedicel 2–5 cm, articulate apically. Calyx tube often broadly campanulate, 6–8 mm. Corolla yellow, 1.6–2 cm; standard rhombic to broadly ovate, apex rounded-obtuse; wings with claw ca. 3/4 as long as limb, auricle spurlike and no longer than 1/3 length of claw; keel with claw slightly shorter than limb, auricle obtuse to deltoid. Ovary glabrous or appressed pubescent. Legume 3.5–6 cm, glabrous. Fl. May–Jun, fr. Aug–Sep. *2n* = 16.

Forest margins, woodlands; 1000–1900 m. Heilongjiang, Xinjiang [Kazakhstan, Mongolia, Russia (Siberia)].

Caragana sibirica as a pre-Linnaean name was used by Royen (Fl. Leyd. Prodr. 537. 1740) and considered by Linnaeus (loc. cit.) to be a synonym of *Robinia caragana*. Although Fabricius used the name *C. sibirica* (Enum., ed. 2, 421. 1763), which would appear to have priority over *C. arborescens*, only generic names are validly published there, and so the first valid publication of *C. sibirica* as a binomial was in the later publication by Medikus (Vorles. Churpfälz. Phys.-Öcon. Ges. 2: 365. 1787).

32. *Caragana boisii* C. K. Schneider, Ill. Handb. Laubholzk. 2: 96. 1907 [“*boisi*”].

扁刺锦鸡儿 bian ci jin ji er

Caragana boisii var. *platycarpa* Yakovlev; *C. microphylla* Lamarck var. *crasseaculeata* Bois.

Shrubs to 1.3 m tall. Branches brown; current-year branchlets purplish brown. Stipules spinelike, 0.8–1.5 cm. Leaves pinnate, 8–20-foliolate; petiole and rachis often caducous; leaflet blades elliptic-oblong to obovate-elliptic, 5–18(–20) × 4–12 mm, sericeous when young but later only sericeous along abaxial veins, apex obtuse to emarginate. Flowers solitary or sometimes to 3 in a fascicle. Pedicel 1.5–2.8 cm, articulate apically. Calyx tube campanulate, 6–11 mm. Corolla yellow, 2–2.5 cm; standard broadly ovate, claw ca. 1/2 as long as limb or shorter; wings with claw ± as long as limb, auricle ca. 1/3 as long as claw; keel with claw ± as long as limb. Ovary pubescent. Legume 2.5–5 cm × 4–6 mm, glabrous. Fl. May, fr. Jul–Aug. $2n = 16^*$.

• Slopes, valleys, terraces; 2200–3200 m. S Gansu, S Shaanxi, Sichuan.

33. *Caragana manshurica* (Komarov) Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 336. 1909.

东北锦鸡儿 dong bei jin ji er

Caragana microphylla Lamarck f. *manshurica* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 22: 582. 1904.

Shrubs to 2 m tall. Branches brown to grayish brown. Leaves pinnate, 10–20-foliolate; petiole and rachis 4–9 cm, caducous; leaflet blades obovate-elliptic to oblong, 1–2 × 0.6–1 cm, pubescent or glabrous, base mostly cuneate, apex obtuse, truncate, or emarginate. Flowers solitary or rarely 2 in a fascicle. Pedicel 1–3 cm, articulate apically. Calyx tube tubular to broadly campanulate, 8–9 mm. Corolla yellow, ca. 2.3 cm; standard suborbicular, claw ca. 1/3 as long as limb; wings with claw ca. 1/2 as long as limb, auricle long and dentiform; keel with claw slightly longer than limb, limb ± cuneate. Ovary nearly glabrous. Legume turgid to cylindrical, ca. 5.5 cm, glabrous. Fl. May, fr. Jul–Aug.

Dry slopes, forest margins; ca. 700 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Korea, E Russia].

34. *Caragana turkestanica* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 314. 1909.

新疆锦鸡儿 xin jiang jin ji er

Shrubs to 2 m tall. Branches gray to grayish green. Leaves pinnate, 6–10-foliolate; petiole and rachis 3–6 cm, caducous or rarely persistent; leaflet blades broadly obovate to elliptic, 1–2 × 0.5–1 cm, glabrous or appressed pilose, apex rounded to truncate. Flowers solitary. Pedicel 2–5 cm, articulate apically from middle. Calyx tube campanulate, 6–8 mm. Corolla yellow; standard broadly ovate, 2.4–2.7 cm, base narrow to shortly clawed; wings 2.7–3 cm, claw ca. 2/5 as long as limb, auricle narrow and ca. 1/3 as long as claw; keel with claw ca. 2/3 as long as limb, auricle short and obtuse. Ovary glabrous. Legume cylindrical, 3–5 cm, glabrous. Fl. May, fr. Jul. $2n = 16$.

Sunny slopes, dry scrub; 1100–1200 m. Xinjiang [Kyrgyzstan].

35. *Caragana davazamcii* Sanchir, Bot. Zhurn. (Moscow & Leningrad) 59: 233. 1974.

沙地锦鸡儿 sha di jin ji er

Caragana davazamcii var. *viridis* Y. X. Liou; *C. erenensis* Y. X. Liou; *C. korshinskii* Komarov var. *davazamcii* (Sanchir) Yakovlev.

Shrubs to 1.5 m tall. Leaflets, pedicels, and current-year branchlets with dense trichomes, not glabrescent, glaucous. Old branches brown and glaucous; branchlets bright yellow. Leaves pinnate, 8–18-foliolate; petiole and rachis 2.5–4 cm, caducous; leaflet blades oblong to obovate-lanceolate, 5–10 × 3–6 mm, both surfaces appressed sericeous to pilose, apex rounded. Flowers solitary or 2 in a fascicle. Pedicel 1–2 cm, articulate basally or apically from middle. Calyx tube broadly tubular, 8–10 mm. Corolla yellow, 2–3 cm; standard suborbicular to orbicular-ovate, claw short, apex emarginate; wings 1.4–2 cm, claw long, auricle dentiform to narrowly linear and 1–3 mm; keel 0.9–1.4 cm, claw ± as long as limb. Ovary with a carpopodium, glabrous or appressed pilose. Legume linear, 3.5–5 cm, falcate, stipitate, glabrous. Fl. May–Jun, fr. Jun–Jul.

Sandy areas, sand dunes in desert steppes; 300–1000 m. Liaoning, Nei Mongol [Mongolia].

36. *Caragana purdomii* Rehder, J. Arnold Arbor. 7: 168. 1926.

秦晋锦鸡儿 qin jin jin ji er

Shrubs to 3 m tall. Leaflets, pedicels, and current-year branchlets pubescent, glabrescent, and not glaucous. Old branches bright yellow, not glaucous; branchlets dark grayish green to brown. Leaves pinnate, 10–16-foliolate; petiole and rachis 2–4 cm, caducous; leaflet blades obovate, elliptic, or oblong, 3–8 × 3–5 mm, both surfaces pilose, apex rounded, emarginate, or acute. Flowers solitary or to 4 in a fascicle. Pedicel 1–2 cm, articulate apically. Calyx tube campanulate-tubular, 8–10 mm, pubescent to nearly glabrous. Corolla yellow, 2.5–2.8 cm; standard broadly obovate, 2–2.7 cm, claw short; wings with a claw ca. 2/3 as long as limb, auricle spurlike and ca. 1/3 as long as claw; keel with claw nearly as long as limb, auricle obtuse. Ovary with a 2.5–4 mm carpopodium, glabrous. Legume 4–5 cm, stipitate, glabrous. Fl. May, fr. Jul–Sep.

• Sunny slopes, loess hills; 700–1700 m. N Shaanxi, W Shanxi.

Plants misidentified as *Caragana sericea* Pampanini ex Komarov by D. W. Zhou et al. (J. NorthE. Normal Univ. 26: 65. 1994) belong here.

37. *Caragana pekinensis* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 339. 1909.

北京锦鸡儿 bei jing jin ji er

Caragana hopeiensis Yakovlev; *C. zahlbruckneri* C. K. Schneider var. *pekinensis* (Komarov) Yakovlev; *C. zahlbruckneri* var. *pilosa* Yakovlev.

Shrubs to 2 m tall. Branches brown to dark brown. Leaves pinnate, 12–16-foliolate; petiole and rachis 2–6 cm, caducous; leaflet blades elliptic to obovate-elliptic, 5–12 × 5–7 mm, both surfaces appressed pubescent, apex obtuse to rounded. Flowers

solitary or 2(–4) in a fascicle. Pedicel 0.6–1.5 cm, articulate apically. Calyx tube tubular-campanulate, 7–8 mm. Corolla yellow, ca. 2.5 cm; standard broadly ovate to broadly elliptic; wings slightly longer than standard, claw ca. 2/3 as long as limb, auricle ca. 3 mm; keel slightly shorter than wings, claw longer than limb, auricle inconspicuous. Ovary sericeous. Legume compressed, 4–6 cm, densely pubescent. Fl. May, fr. Jul. $2n = 16^*$.

- Hillsides, loess hills; 400–1000 m. Hebei, N Shanxi.

38. *Caragana litwinowii* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 340. 1909.

锦州锦鸡儿 jīn zhōu jīn jī er

Caragana zahlbruckneri C. K. Schneider subsp. *litwinowii* (Komarov) Yakovlev.

Shrubs to 60 cm tall. Branches bright brown to yellowish gray. Stipules spinelike, 1–1.3 cm. Leaves pinnate, 16–20-foliolate; petiole and rachis caducous; leaflet blades obovate-oblong, 6–7 × 2–4 mm, glabrous, apex acute. Flowers solitary. Pedicel 7–8 mm, articulate near middle. Calyx tube tubular-campanulate. Corolla yellow, ca. 2.2 cm; standard broadly ovate, limb ca. 1.7 × 1.4 cm, claw short; wings oblong, claw ca. 1/3 as long as limb, auricle dentiform and ca. 3 mm; keel with claw ca. 1/2 as long as limb, auricle inconspicuous. Ovary glabrous. Legume not seen. Fl. May.

- Slopes; ca. 500 m. Liaoning (Jinxian).

39. *Caragana microphylla* Lamarck, Encycl. 1: 615. 1785.

小叶锦鸡儿 xiǎo yè jīn jī er

Caragana microphylla f. *cinerea* Komarov; *C. microphylla* f. *daurica* Komarov; *C. microphylla* f. *pallasiana* Komarov; *C. microphylla* f. *viridis* Komarov.

Shrubs to 2(–3) m tall. Branches dark gray to dark green; branchlets glabrous or tomentose. Stipules spinelike, 1.5–5 mm, usually obliquely erect. Leaves pinnate, 10–20-foliolate; petiole and rachis caducous; leaflet blades obovate to obovate-oblong, 3–10 × 2–8 mm, glabrous, pubescent, or tomentose, apex obtuse to truncate. Flowers solitary. Pedicel ca. 1 cm, articulate near middle. Calyx tube tubular-campanulate, 0.9–1.2 cm, glabrous or tomentose. Corolla yellow, ca. 2.5 cm; standard broadly ovate, claw short, apex minutely emarginate; wings with claw ca. 1/2 as long as limb, auricle short and dentiform; keel with a claw as long as limb, auricle inconspicuous. Ovary often glabrous. Legume cylindrical, 4–5 cm × 4–5 mm. Fl. May–Jun, fr. Jul–Aug. $2n = 16$.

Consolidated and semiconsolidated sand dunes, rocky mountain slopes; 1000–2000 m. Jilin, Liaoning, Nei Mongol [Mongolia, Russia (Siberia)].

Caragana microphylla is a polymorphic species and in some cases with transitional forms. Hybrids between this species and *C. korshinskii* may occur where these species are sympatric.

This species is planted for dune stabilization and for soil and water conservation.

40. *Caragana potaninii* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 352. 1909.

五台锦鸡儿 wu tai jīn jī er

Caragana microphylla Lamarck var. *potaninii* (Komarov) Y. X. Liou ex L. Z. Shue.

Shrubs, small, thorny. Branches brownish to brownish olive. Stipules spinelike, 1.5–5 mm, ± deflexed hooklike. Leaves pinnate, 8–12(or 14)-foliolate; petiole and rachis caducous; leaflet blades obovate to rarely almost elliptic, 5–17 × 3.5–7 mm, grayish when dry, both surfaces adpressed pubescent, apex emarginate. Flowers 1 or 2 in a fascicle. Pedicel 7–12 mm. Calyx usually broadly campanulate to rarely tubular-campanulate, ± pubescent or rarely glabrous. Corolla 2–2.3 cm; standard ovate, gradually or sharply narrowed into a relatively wide to narrow claw; wings with claw shorter than limb; keel with a claw as long as limb. Ovary glabrous or sparsely appressed pubescent. Legume cylindrical, 4–6 cm × ca. 5 mm, usually obliquely erect. Fl. Apr–May, fr. Jun–Jul.

- Rocky mountain slopes; 1000–1400 m. N Shanxi (Hunyuan, Wutai).

41. *Caragana liouana* Zhao Y. Chang & Yakovlev, **nom. nov.**

中间锦鸡儿 zhōng jiān jīn jī er

Replaced synonym: *Caragana korshinskii* Komarov var. *ordosica* Yakovlev, Bot. Zhurn. (Moscow & Leningrad) 69: 358. 1984, not *Caragana ordosica* Y. Z. Zhao, Zong Y. Zhu & L. Q. Zhao, Bull. Bot. Res., Harbin 25: 386. 2005.

Shrubs to 1.5(–2) m tall. Branches yellowish gray-green. Stipules spinelike, 4–7 mm. Leaves pinnate, 6–16-foliolate; petiole and rachis 1–5 cm, caducous; leaflet blades elliptic to obovate-elliptic, 3–10 × 4–6 mm, whitish green, both surfaces villous, apex rounded, acute, or rarely truncate. Flowers solitary. Pedicel 1–1.6 cm, articulate apically from middle. Calyx tube campanulate, 7–12 mm. Corolla yellow, 2–2.5 cm; standard broadly ovate to suborbicular, claw ca. 1/4–1/3 as long as limb; wings oblong, claw nearly as long as limb, auricle not prominent. Ovary glabrous. Legume lanceolate to oblong-lanceolate, 2.5–3.5 cm × 6–7 mm, flat, apex acute. Fl. May, fr. Jun. $2n = 16^*$.

- Consolidated and semiconsolidated sand dunes; 900–2400 m. Gansu, N Hebei, Nei Mongol, Ningxia, Shaanxi, W Shanxi.

Most plants identified in herbaria as *Caragana intermedia* and treated as such in FRPS (42(1): 47. 1993) belong here, but the type of *C. intermedia* is synonymous with *C. korshinskii*. Because the specific epithet “*ordosica*” is already occupied in *Caragana*, a replacement name is used in recognition of Professor Liou Yingxin (刘焯心) for her work on the *Caragana* of China.

42. *Caragana korshinskii* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 351. 1909.

柠条锦鸡儿 níng tiáo jīn jī er

Caragana intermedia Kuang & H. C. Fu; *C. korshinskii* f. *brachypoda* Y. X. Liou; *C. korshinskii* var. *intermedia* (Kuang & H. C. Fu) M. L. Zhang & G. H. Zhu; *C. microphylla* Lamarck var. *tomentosa* Komarov.

Shrubs or trees, 1–4 m tall. Branches golden yellow, shiny; branchlets pubescent. Stipules spinelike, 3–7 mm. Leaves pin-

nate, 12–16-foliolate; petiole and rachis 3–5 cm, caducous; leaflet blades lanceolate to narrowly oblong, 7–8 × 2–7 mm, whitish, both surfaces densely appressed sericeous, apex acute to obtuse. Flowers solitary. Pedicel 0.6–1.5 cm, articulate apically. Calyx tube tubular-campanulate, 8–9 mm. Corolla 2–2.3 cm; standard broadly ovate to suborbicular, claw short, apex truncate to slightly emarginate; wings with claw slightly shorter than limb, auricle small and dentiform; keel with long claw, auricle very small. Ovary glabrous. Legume lanceolate, 2–2.5 cm × 6–7 mm, flat. Fl. May–Jun, fr. Jun–Jul. $2n = 16$.

Semiconsolidated sand dunes; 900–2400 m. Gansu, Nei Mongol, Ningxia, Qinghai, W Shanxi, Xinjiang [Mongolia].

Although the type of *Caragana intermedia* is synonymous with *C. korshinskii*, most specimens identified in herbaria as *C. intermedia* and treated as such in FRPS (42(1): 47. 1993) are misidentified and actually are *C. liouana*.

43. *Caragana leucophloea* Pojarkova in Komarov, Fl. URSS 11: 399. 1945.

白皮锦鸡儿 bai pi jin ji er

Caragana aurantiaca Koehne var. *deserticola* Komarov.

Shrubs to 1.5 m tall. Branches yellowish white to yellow; current-year branchlets purplish red. Leaves digitate, 4-foliolate; petiole 5–8 mm and persistent on long branchlets, absent and leaves clustered on short branchlets; leaflet blades narrowly oblanceolate, 4–12 × 1–3 mm, green, pale green, or reddish, both surfaces glabrous or appressed pubescent, apex acute to obtuse. Flowers solitary or 2 in a fascicle. Pedicel 3–15 mm, glabrous, articulate basally or apically from middle. Calyx tube campanulate, 5–6 mm. Corolla yellow; standard broadly obovate, 1.3–1.8 cm, claw short; wings with claw ca. 1/3 as long as limb, auricle ca. 2/3 as long as claw; keel with claw slightly shorter than limb, auricle obtuse and ca. 2 mm. Ovary glabrous. Legume cylindrical, 3–3.5 cm, glabrous. Fl. May–Jun, fr. Jul–Aug.

Dry slopes, desert valleys; 900–2700 m. N Gansu, Nei Mongol, Xinjiang [Kazakhstan, Mongolia].

44. *Caragana pygmaea* (Linnaeus) Candolle, Prodr. 2: 268. 1825.

矮锦鸡儿 ai jin ji er

Shrubs to 50 cm tall. Branches golden yellow, shiny, pubescent when young but gradually glabrescent. Leaves digitate, 4-foliolate; petiole 4–6 mm and persistent on long branchlets, absent and leaves clustered on short branchlets; leaflet blades oblanceolate to linear, (5–)7–17(–30) × 1–3 mm, both surfaces glabrous, apex obtuse to acute. Flowers solitary. Pedicel 0.6–2 cm, articulate basally or apically from middle, glabrous or pubescent. Calyx tube tubular-campanulate, 5–6 mm. Corolla yellow, 1–1.6 cm; standard broadly obovate, claw ca. 1/3 as long as limb; wings oblong, inflated toward apex, auricle short; keel with claw as long as limb, auricle obtuse. Ovary densely pubescent. Legume linear, 2–3 cm, pubescent when young, glabrescent. Fl. May, fr. Jun. $2n = 16$.

Sandy areas, rocky slopes, hilly areas among rocks; 900–1300 m. Hebei, Nei Mongol, Xinjiang [Mongolia, E Russia].

1a. Pedicel articulate basally from middle; corolla 1–1.5 cm 44c. var. *parviflora*
1b. Pedicel articulate near middle; corolla 1.5–1.6 cm.

2a. Branchlets stout, pubescent when young, gradually glabrescent; leaflet blades narrowly oblanceolate, ca. 3 mm wide 44a. var. *pygmaea*

2b. Branchlets slender, densely pubescent; leaflet blades linear, ca. 1 mm wide 44b. var. *angustissima*

44a. *Caragana pygmaea* var. *pygmaea*

矮锦鸡儿(原变种) ai jin ji er (yuan bian zhong)

Robinia pygmaea Linnaeus, Sp. Pl. 2: 723. 1753; *Caragana pygmaea* f. *longifolia* Komarov.

Branchlets stout, pubescent when young, glabrescent. Leaflet blades narrowly oblanceolate, ca. 3 mm wide. Pedicel articulate near middle. Corolla 1.5–1.6 cm. $2n = 16$.

Sandy areas; ca. 1200 m. Nei Mongol, Xinjiang [Mongolia, E Russia].

44b. *Caragana pygmaea* var. *angustissima* C. K. Schneider, III. Handb. Laubholz. 2: 102. 1907.

窄叶矮锦鸡儿 zhai ye ai jin ji er

Caragana stenophylla Pojarkova var. *sericea* H. C. Fu.

Branchlets slender, glaucous, densely pubescent. Leaflet blades linear, 5–10(–30) × ca. 1 mm. Pedicel articulate near middle. Corolla 1.5–1.6 cm.

• Sandy areas; 900–1300 m. Nei Mongol.

44c. *Caragana pygmaea* var. *parviflora* H. C. Fu, Fl. Intramontol. 3: 287. 1978.

小花矮锦鸡儿 xiao hua ai jin ji er

Leaflet blades linear-oblanceolate, 5–10 mm. Pedicel articulate basally from middle. Corolla 1–1.5 cm.

• Rocky slopes, hilly areas among rocks. Nei Mongol.

45. *Caragana altaica* (Komarov) Pojarkova in Komarov, Fl. URSS 11: 345. 1945.

阿尔泰锦鸡儿 a er tai jin ji er

Caragana pygmaea (Linnaeus) Candolle var. *altaica* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 242. 1909; *C. pygmaea* subsp. *altaica* (Komarov) Bondareva.

Shrubs to 1 m tall. Bark yellow. Branchlets whitish green when young, glabrous. Leaves digitate, 4-foliolate; petiole 4–8 mm on long branchlets but absent on short branches; leaflet blades narrowly obovate to oblanceolate, 5–15(–23) × 2–3 mm, pubescent when young and glabrate when mature. Flowers solitary. Pedicel 1.2–2.5 cm, articulate somewhat basally from middle. Calyx tube tubular-campanulate, 5–7 × 4–5 mm. Corolla yellow, 1.8–2 cm; standard obovate to suborbicular, claw 1/4–1/3 as long as limb; wings oblong, somewhat dilated toward

apex, claw ca. 1/2 as long as limb, auricle 1/5–1/4 as long as claw; keel with claw 1/3–1/2 as long as limb, auricle short. Legume cylindrical, 2–3.5 cm, glabrous. Fl. May–Jun, fr. Jun–Jul. $2n = 16$.

Stony slopes, rocky areas; 800–1300 m. N Xinjiang [Mongolia].

46. *Caragana aurantiaca* Koehne, Deut. Dendrol. 340. 1893.

镰叶锦鸡儿 *lian ye jin ji er*

Caragana aurantiaca var. *conferta* Komarov.

Shrubs to 1 m tall. Bark greenish brown to dark gray, shiny. Branchlets strong and long. Leaves digitate, 4-foliolate; petiole and rachis 3–5 mm on long branchlets but absent on short branchlets; leaflet blades linear to lanceolate-linear, 4–16 × 1–2 mm, falcate, glabrous. Flowers solitary. Pedicel 6–9 mm, articulate basally from middle. Calyx tube campanulate, 6–7 mm. Corolla orange, 1.8–2 cm; standard suborbicular, claw 1/4–1/3 as long as limb, apex rounded to emarginate; wings narrowly oblong, claw ca. 1/2 as long as limb, auricle ca. 3/4 to ± as long as claw; keel with claw shorter than limb, auricle short. Ovary glabrous. Legume cylindrical, 2.5–4 cm, slightly compressed, glabrous. Fl. Jun–Jul, fr. Aug. $2n = 16$.

Rocky slopes, bottomlands near riversides, forest margins; 1000–1100 m. Xinjiang [Afghanistan, Kazakhstan, Pakistan, Uzbekistan; SW Asia].

47. *Caragana pumila* Pojarkova in Komarov, Fl. URSS 11: 346. 1945.

草原锦鸡儿 *cao yuan jin ji er*

Shrubs 30–60 cm tall. Branchlets yellowish green with brown stripes, puberulent when young. Leaves digitate, 4-foliolate; petiole 4–6 mm and persistent on long branchlets, absent on short branchlets; leaflet blades narrowly oblanceolate to linear-oblanceolate, 4–12 × 0.5–1.2 mm, dark green but abaxially tinged ± reddish, pubescent when young. Flowers solitary. Pedicel 0.8–1.5 cm, articulate at or near middle. Calyx tube tubular, 4–6 mm. Corolla yellow, 1.5–2 cm; standard ovate to obovate, claw 1/6–1/5 as long as limb; wings with claw ca. 1/3 as long as limb, auricle ca. 2/3 as long as claw; keel with claw slightly shorter than limb, auricle small, short, and obtuse. Ovary linear, ca. 1.5 cm, glabrous. Legume ca. 2.5 cm. Fl. May–Jun, fr. Jun–Jul.

Mountain steppes, rocky slopes; 1200–1500 m. Xinjiang (Bole, Wenquan) [Kazakhstan].

48. *Caragana versicolor* Benth in Royle, Ill. Bot. Himal. Mts. 198. 1835.

变色锦鸡儿 *bian se jin ji er*

Shrubs to 80 cm tall. Bark brown to dark brown. Stipule spines 1–4 mm on long branchlets. Leaves digitate, 4-foliolate; petiole 5–10 mm and persistent on long branchlets, absent on short branchlets; leaflet blades narrowly lanceolate, obovate-cuneate, or linear, 5–7 × 1–1.5 mm, green to grayish green, glabrous. Flowers solitary. Pedicel ca. 5 mm, articulate basally. Calyx tube tubular, 5–6 mm. Corolla yellow, 1.1–1.2 cm; standard suborbicular, abaxially reddish brown, claw ca. 1/2 as long as

limb; wings with claw shorter than limb, auricle ca. 1/4 as long as claw; keel with claw ± as long as limb, auricle ca. 1 mm. Legume 2–2.5 cm, apex acute. Fl. May–Jun, fr. Jul–Aug. $2n = 16 + 2B, 18$.

Rocky slopes, riversides, among shrubs; 3000–4900 m. Qinghai, W Sichuan, Xizang [Afghanistan, NW India, Kashmir, Nepal, Pakistan; SW Asia].

49. *Caragana stenophylla* Pojarkova in Komarov, Fl. URSS 11: 397. 1945.

狭叶锦鸡儿 *xia ye jin ji er*

Caragana pygmaea (Linnaeus) Candolle var. *pallasiana* Komarov; *C. stenophylla* var. *parviflora* Zhan Wang & H. C. Fu.

Shrubs to 80 cm tall. Bark grayish green, yellowish brown, or dark brown. Stipule spines 4–7 mm on long branchlets. Leaves digitate, 4-foliolate; petiole 4–7 mm and persistent on long branchlets, absent on short branchlets; leaflet blades linear-lanceolate to linear, 4–11 × 1–2 mm, both surfaces green to grayish green. Flowers solitary. Pedicel 5–10 mm, articulate slightly basally from middle. Calyx tube campanulate-tubular, 4–6 mm. Corolla yellow but standard orangish brown at middle; standard orbicular to broadly obovate, 0.8–1.8(–2) cm, claw broad and short; wings with claw ca. 1/2 as long as limb, auricle elliptic and 1/4–1/2 as long as claw; keel with a claw longer than limb, auricle obtuse. Ovary glabrous. Legume cylindrical, 2–2.5 cm. Fl. Apr–Jun, fr. Jul–Aug. $2n = 32$.

Sandy areas, stony slopes, loess hills; 600–2500 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, E Qinghai, Shaanxi, N Shanxi [Mongolia, E Russia].

50. *Caragana kirghisorum* Pojarkova in Komarov, Fl. URSS 11: 396. 1945.

囊萼锦鸡儿 *nang e jin ji er*

Shrubs to 1 m tall. Branches grayish brown; current-year branchlets grayish brown to bright gray. Leaves digitate, 4-foliolate; petiole 4–12 mm and persistent on long branchlets, 1–3 mm and caducous on short branchlets; leaflet blades obovate, elliptic-obovate, or oblanceolate, 4–9 × 1.5–3 mm, glabrous, base cuneate, apex sharply acute. Flowers solitary or rarely 2 in a fascicle. Pedicel 1.2–1.4 cm, articulate near middle. Calyx tube tubular, 1.2–1.3 cm, base saccate. Corolla yellow but standard and keel purple at anthesis, 2.7–3.2 cm; standard obovate, 1.3–1.7 cm, base gradually narrowing into a claw, apex rounded to slightly emarginate; wings with claw nearly as long as limb, auricle acute; keel with claw longer than limb, auricle obtusely dentiform. Ovary glabrous. Legume linear, 2.5–5 cm, glabrous, apex acuminate. Fl. May–Jun, fr. Jul–Aug.

Rocky slopes on foothills, stony lands, riverbanks; 700–1100 m. Xinjiang [Kazakhstan, Kyrgyzstan].

51. *Caragana brachypoda* Pojarkova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 13: 135. 1950.

矮脚锦鸡儿 *ai jiao jin ji er*

Shrubs to 30 cm tall. Bark yellowish brown to grayish

brown. Current-year branchlets brown to yellowish brown. Leaves digitate, 4-foliolate; petiole 4–10 mm and persistent on long branchlets, absent on short branchlets; leaflet blades oblanceolate, 2–10 × 1–3 mm, both surfaces pubescent, apex acute. Flowers solitary. Pedicel 2–5 mm, articulate basally. Calyx reddish purple to greenish brown, 0.9–1.1 cm, base gibbous. Corolla yellow but with orange or purple at middle, 2–2.5 cm, apex slightly emarginate; wings with claw ± as long as limb, apex obliquely truncate, auricle small and short; keel as long as wings, claw long, auricle short. Ovary glabrous. Legume spindlelike, 2–3.5 cm, turgid, glabrous, apex acuminate. Fl. Apr–May, fr. Jun–Jul. $2n = 16, 32$.

Bases of hills, stony areas, sand dunes; 900–2000 m. Gansu, Nei Mongol, Ningxia, Shaanxi (Dingbian) [S Mongolia].

52. *Caragana kansuensis* Pojarkova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 13. 138. 1950.

甘肃锦鸡儿 gan su jin ji er

Shrubs to 60 cm tall. Branches grayish brown. Leaves digitate, 4-foliolate; petiole 4–10 mm and persistent on long branchlets, 2–4 mm and caducous on short branchlets; leaflet blades linear-oblongate, 5–12 × 1–2 mm, both surfaces glabrous or pilose, apex acute. Flowers solitary. Pedicel 5–12 mm, articulate apically. Calyx tube tubular, 6–9 mm, base gibbous. Corolla yellow but standard with straw-colored spots at middle, 2–2.5 cm; standard ovate to broadly ovate, 2–2.5 cm, claw ca. 1/3 as long as limb, apex emarginate; wings ± as long as standard, claw ± as long as limb, auricle ca. 2 mm; keel ± as long as wings, with a longer claw and short auricle. Ovary glabrous. Legume cylindrical, 2–3.5 cm, glabrous, apex acute. Fl. Apr–Jun, fr. Jun–Aug.

• Loess hills, hillsides; 900–1900 m. E Gansu, Ningxia.

Y. Z. Zhao (Acta Sci. Nat. Univ. Intramongol. 22: 97–100. 1991) considered that collections attributed to this species from Nei Mongol, N Shaanxi, and N Shanxi in FRPS (42(1): 57. 1993) are actually representatives of *Caragana opulens*, with leaflet blade narrower and acute at apex. However, they seem more related to *C. licentiana* in their leaflets pubescent and abaxially tinged reddish when dried.

53. *Caragana leveillei* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 207. 1909.

毛掌叶锦鸡儿 mao zhang ye jin ji er

Caragana sinica (Buc'hoz) Rehder var. *longipedunculata* C. W. Chang.

Shrubs to 1 m tall. Bark dark brown. Current-year branchlets grayish brown, densely pubescent. Leaves digitate, 4-foliolate; petiole 4–12 mm, persistent or caducous; leaflet blades obovate, 5–20(–30) × 2–10(–15) mm, densely pubescent, apex rounded, truncate, or emarginate. Flowers solitary. Pedicel 0.8–1.2 cm, articulate basally from middle. Calyx tube ca. 1 cm, base gibbous. Corolla yellow to pinkish, 2.5–2.8 cm; standard obovate-cuneate, claw ca. 5 mm, apex obtuse to emarginate; wings with claw ± as long as limb, auricle small; keel with claw ± as long as limb, auricle small. Ovary densely villous. Legume cylindrical, 2–3(–4) cm, densely villous. Fl. Apr–May, fr. Jun.

• Hilly slopes; 500–1300 m. Hebei, Henan, Shaanxi, Shandong, Shanxi.

54. *Caragana opulens* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 208. 1909.

甘蒙锦鸡儿 gan meng jin ji er

Caragana opulens var. *perforata* Mergen & Y. Q. Ma; *C. opulens* var. *trichophylla* Z. H. Gao & S. C. Zhang.

Shrubs to 60 cm tall. Bark grayish brown. Branchlets bright gray. Leaves digitate, 4-foliolate; petiole 2–5 mm, persistent on long branchlets, caducous on short branchlets; leaflet blades obovate to oblanceolate, 3–12(–15) × 1–4(–8) mm, glabrous or pubescent, apex rounded to truncate. Flowers solitary. Pedicel 0.7–2.5 cm, articulate apically. Calyx tube campanulate-tubular, 8–10 mm, base gibbous. Corolla yellow but standard sometimes reddish; standard broadly obovate, 2–2.5 cm, apex emarginate; wings with claw slightly shorter than limb, auricle oblong; keel with claw slightly shorter than limb, auricle dentiform. Ovary glabrous. Legume cylindrical, 2.5–4 cm, glabrous, apex acute. Fl. May–Jun, fr. Jun–Jul. $2n = 16^*$.

• Dry slopes, valleys, hills; 1200–4700 m. Gansu, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, W Sichuan, Xizang.

This is a polymorphic species with great variation. Whether *Caragana opulens* var. *perforata* and *C. opulens* var. *trichophylla* should be recognized requires further study.

55. *Caragana rosea* Turczaninow ex Maximowicz, Prim. Fl. Amur. 470. 1859.

红花锦鸡儿 hong hua jin ji er

Shrubs to 1 m tall. Bark greenish brown to grayish brown. Leaves digitate, 4-foliolate; petiole 5–10 mm, caducous or persistent; leaflet blades obovate, 1–2.5 × 0.4–1.2 cm, glabrous, apex obtuse to emarginate. Flowers solitary. Pedicel 0.8–1.9 cm, articulate basally to apically. Calyx tube purplish red, tubular, 7–9 mm. Corolla yellow, purplish red, or pinkish, later reddish, 2–2.5 cm; standard oblong-obovate, apex emarginate; wings oblong-linear, claw slightly shorter than limb, auricle shortly dentiform; keel with claw equal to limb, auricle inconspicuous. Ovary glabrous. Legume cylindrical, 3–6 cm, apex acuminate. Fl. May–Jun, fr. Jun–Jul. $2n = 16^*$.

• Slopes, valleys; 200–2100 m. Anhui, S Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, N Sichuan.

56. *Caragana qingheensis* Zhao Y. Chang, L. R. Xu & F. C. Shi, Ann. Bot. Fenn. 43: 445. 2006.

青河锦鸡儿 qing he jin ji er

Shrubs 50–100 cm tall. Bark yellowish brown, with grayish corky stripes. Leaves digitate, 4-foliolate; petiole 3–5 mm and persistent on long branchlets, 1–3 mm and caducous on short branchlets; leaflet blades obovate to elliptic-obovate, 3–8 × 2–3.5 mm, both surfaces pubescent, base cuneate, apex obtuse. Flowers solitary. Pedicel 0.8–1.5 cm, articulate usually apically from middle, densely pubescent. Calyx tube tubular-campanulate, 6–7 mm, pubescent. Corolla yellow, 1.5–1.8 mm;

standard broadly ovate, claw 1/6–1/5 as long as limb, apex emarginate; wings narrowly oblong, claw ca. 1/3 as long as limb, auricle linear and 1/2–2/3 as long as claw; keel broader than wings, claw 1/2–2/3 as long as limb, auricle obtuse. Ovary linear, densely pubescent. Legume oblanceolate when young, 1.5–2 cm, pubescent. Fl. May–Jun, fr. Jun–Jul.

- Rocky mountain slopes; ca. 1300 m. Xinjiang (Qinghe).

57. *Caragana camilloi-schneideri* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 217. 1909 [*“camilli-schneideri”*].

北疆锦鸡儿 bei jiang jin ji er

Shrubs to 2 m tall. Bark brown. Leaves digitate, 4-foliolate; petiole 2–10 mm and persistent on long branchlets, caducous on short branchlets; leaflet blades obovate to broadly lanceolate, 1–2(–3) × 0.6–0.7(–1) cm, glabrous, apex obtuse to acute. Flowers solitary or 2 in a fascicle. Pedicel 1–1.5(–2) cm, articulate apically. Calyx tube 9–10 mm, base gibbous. Corolla yellow, 2.8–3.1 cm; standard suborbicular to ovate, claw ca. 1/4 as long as limb; wings with claw ca. 1/3 as long as limb, auricle ca. 4 mm; keel with claw ± as long as limb, auricle inconspicuous. Ovary densely pubescent. Legume cylindrical, 4–5 cm, pubescent. Fl. May–Jun, fr. Jul–Aug. $2n = 32$.

- Rocky dry slopes, valleys; 600–1800 m. Xinjiang [Kyrgyzstan].

58. *Caragana licentiana* Handel-Mazzetti, Oesterr. Bot. Z. 82: 249. 1933.

白毛锦鸡儿 bai mao jin ji er

Caragana opulens Komarov var. *licentiana* (Handel-Mazzetti) Yakovlev.

Shrubs to 60 cm tall. Bark greenish brown to reddish brown. Leaves digitate, 4-foliolate; petiole 2–3 mm, persistent; leaflet blades obovate to oblanceolate, 5–12 × 2–4 mm, both surfaces densely pubescent, apex rounded and sometimes emarginate. Flowers solitary or 2 in a fascicle. Pedicel 0.6–2 cm, articulate apically. Calyx tube tubular, 7–10 mm. Corolla yellow but standard with orange spots at middle, 2–2.2 cm; standard broadly obovate to suborbicular, apex emarginate; wings with claw ± as long as limb, auricle dentiform and ca. 2 mm; keel with claw longer than limb, auricle dentiform. Ovary densely pubescent. Legume cylindrical, 2.5–3.5 cm, pubescent. Fl. Apr–Jun, fr. Jul–Aug. $2n = 32^*$.

- Dry slopes; 1500–2400 m. Gansu, Ningxia, Qinghai.

Yakovlev (Rast. Tsentral. Azii 8a: 38. 1988) considers this taxon to be a variety of *Caragana opulens*, although this is not supported by chromosome data. However, between the two taxa there seem to exist hybrids with which it is difficult to deal. At least one variety could be separated whose leaflets are oblanceolate to obcuneate, with apex acute to obtuse. It is often wrongly identified as *C. kansuensis* in major herbaria of China (see also note under *C. kansuensis*, p. 542).

59. *Caragana shensiensis* C. W. Chang, Acta Phytotax. Sin. 17(2): 83. 1979.

秦岭锦鸡儿 qin ling jin ji er

Caragana wenhsienensis C. W. Chang; *C. wenhsienensis*

var. *inermis* C. W. Chang.

Shrubs to 1.5 m tall. Branches purplish brown; branchlets grayish brown. Leaves digitate, 4-foliolate; petiole 1–1.5 cm, caducous; leaflet blades obovate-cuneate, 1–2.2 × 0.4–0.7 cm, with apical ones largest, abaxially sparsely white pubescent, adaxially glabrous, base cuneate, apex rounded to nearly truncate. Flowers solitary. Pedicel 8–9 mm, articulate apically. Calyx tube tubular, ca. 6 mm. Corolla yellow but adaxially reddish yellow; standard orbicular, ca. 2.2 cm, claw broad and short; wings narrowly oblong, ca. 2.4 cm, claw slightly shorter than limb, auricle short; keel broader than wing, auricle obtuse. Ovary pubescent. Legume cylindrical, 2.5–3.5 cm, pubescent to glabrescent. Fl. Apr–May, fr. Jun–Jul.

- Riverbanks; 400–900 m. Gansu, Shaanxi.

60. *Caragana polourensis* Franchet, Bull. Mus. Hist. Nat. (Paris) 3: 321. 1897.

昆仑锦鸡儿 kun lun jin ji er

Shrubs to 50 cm tall. Branches brown to bright brown. Leaves digitate, 4-foliolate; petiole 8–10 mm and persistent on long branchlets, 4–6 mm and caducous on short branchlets; leaflet blades obovate, 6–10 × 2–4 mm, both surfaces appressed pubescent, apex acute, obtuse, or sometimes emarginate. Flowers solitary. Pedicel 2–6 mm, articulate basally to apically. Calyx tube tubular, 8–10 mm. Corolla yellow but standard sometimes with orange spots, ca. 2 cm; standard suborbicular to obovate; wings with claw shorter than limb, auricle short; keel with claw shorter than limb, auricle short. Ovary pubescent. Legume cylindrical, 2.5–3.5 cm, pubescent to glabrescent. Fl. Apr–May, fr. Jun–Jul.

- Hillsides, plains; 1700–3200 m. C Gansu, S Xinjiang.

61. *Caragana brevifolia* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 211. 1909.

短叶锦鸡儿 duan ye jin ji er

Shrubs to 2 m tall, glabrous. Bark dark grayish brown. Branchlets sometimes arched. Leaves digitate, 4-foliolate; petiole 3–8 mm on long branchlets, nearly absent on short branchlets; leaflet blades lanceolate to obovate-lanceolate, 2–8 × 1–4 mm, base cuneate, apex acute. Flowers solitary. Pedicel 5–8 mm, articulate basally to near middle. Calyx tube tubular-campanulate, 5–6 mm, glaucous. Corolla yellow, 1.4–1.6 cm; standard broadly ovate, ca. 1.4 cm, claw ca. 4 mm; wings with claw ± as long as limb, auricle dentiform and small; keel with claw ± as long as limb, auricle dentiform. Ovary glabrous. Legume dark brown when mature, cylindrical, 1–2.5(–3.5) cm. Fl. Jun–Jul, fr. Aug–Sep. $2n = 16$.

Riverbanks, valleys, mixed scrub; 1800–3800 m. Gansu, Ningxia, Qinghai, W Sichuan, SE Xizang, NW Yunnan [N India, Kashmir, Pakistan].

62. *Caragana chinghaiensis* Y. X. Liou, Acta Phytotax. Sin. 22: 209. 1984.

青海锦鸡儿 qing hai jin ji er

Shrubs 20–100 cm tall. Branches greenish brown to dark

brown. Leaves digitate, 4-foliolate; petiole 5–7 mm, persistent; leaflet blades narrowly oblanceolate, 5–13 × 0.5–3 mm, glabrous, base cuneate, apex acute to slightly acuminate. Flowers solitary. Pedicel 4–5 mm, articulate basally. Calyx tube campanulate, 5–6 × ca. 4 mm. Corolla yellow, ca. 1.3 cm or 1.6–2 cm; standard broadly obovate, claw short, apex emarginate; wings oblong, claw slightly shorter than 1/2 of limb, auricle linear and nearly as long as claw; keel with claw slightly longer than 1/2 of limb, auricle inconspicuous. Ovary glabrous. Legume cylindric, 3–4 cm, glabrous. Fl. May, fr. Sep.

• Terraces, sand dunes, sunny scrub, grasslands; 2600–4100 m. Gansu, Qinghai, Sichuan.

- 1a. Shrubs 50–100 cm tall; leaflet blades 6–13 × 2–3 mm; calyx tube ca. 6 × 4 mm; corolla 1.6–2 cm 62a. var. *chinghaiensis*
1b. Shrubs to 20 cm tall; leaflet blades 5–9 × ca. 0.5 mm; calyx tube ca. 5 × 4 mm; corolla ca. 1.3 cm 62b. var. *minima*

62a. *Caragana chinghaiensis* var. *chinghaiensis*

青海锦鸡儿(原变种) qing hai jin ji er (yuan bian zhong)

Shrubs 50–100 cm tall. Leaflet blades 6–13 × 2–3 mm. Calyx tube ca. 6 × 4 mm. Corolla 1.6–2 cm.

• Terraces, sand dunes, sunny scrub; 2600–3600 m. Gansu, Qinghai.

62b. *Caragana chinghaiensis* var. *minima* Y. X. Liou, Acta Phytotax. Sin. 22: 209. 1984.

小青海锦鸡儿 xiao qing hai jin ji er

Shrubs to 20 cm tall. Leaflet blades 5–9 × ca. 0.5 mm. Calyx tube ca. 5 × 4 mm. Corolla ca. 1.3 cm.

• Grasslands; 3600–4100 m. SE Qinghai, Sichuan.

63. *Caragana densa* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 258. 1909.

密叶锦鸡儿 mi ye jin ji er

Shrubs to 1.5 m tall. Bark dark brown, greenish brown, or yellowish brown. Branchlets arched. Leaves digitate, 4-foliolate; petiole 1–1.2 cm and persistent on long branchlets, 5–10 mm and caducous on short branchlets; leaflet blades obovate to linear, 6–13 × 2–3 mm, abaxially sparsely pilose, base narrowly cuneate, apex acute. Flowers solitary. Pedicel 3–4 mm, articulate basally. Calyx tube campanulate, 7–10 mm. Corolla yellow, 1.8–2.3 cm; standard broadly ovate, claw shorter than limb, apex obtuse; wings oblong, claw slightly longer than limb, auricle linear and ca. 1/3 as long as claw; keel with claw ± as long as limb, auricle small. Ovary glabrous. Legume cylindric, 3–3.5 cm × 3–4 mm, glabrous. Fl. May–Jun, fr. Jul–Aug. $2n = 16^*$.

• Dry slopes in mixed woodlands; 1700–4000 m. Gansu, Qinghai, W Sichuan, Xinjiang, NW Yunnan.

64. *Caragana turfanensis* (Krasnov) Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 213. 1909.

吐鲁番锦鸡儿 tu lu fan jin ji er

Caragana frutescens Linnaeus var. *turfanensis* Krasnov, Zap. Russk. Geogr. Obshch. Obshchei Geogr. 19: 336. 1888.

Shrubs to 1 m tall. Branches yellowish brown; branchlets pale brown. Leaves digitate, 4-foliolate; petiole 0.7–1.3 cm and persistent on long branchlets, persistent or caducous on short branchlets; leaflet blades obovate to obovate-cuneate, 4–6 × 2–3 mm, glabrous or pubescent, apex acute. Flowers solitary. Pedicel 2–5 mm, articulate basally. Calyx tube tubular, 6–8 mm. Corolla yellow; standard obovate, 1.7–2.2 cm, claw 1/3–1/2 as long as limb, apex obtuse; wings linear-oblong, claw more than 1/2 as long as limb, auricle 1/5–1/4 as long as claw; keel with claw shorter than limb, auricle very short. Ovary glabrous. Legume 3–4.5 cm × 4–6 mm. Fl. May, fr. Jul.

• Slopes, terraces, steep slopes; 1300–2100 m. Xinjiang.

65. *Caragana laeta* Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 215. 1909.

阿拉套锦鸡儿 a la tao jin ji er

Shrubs 1–2 m tall. Bark greenish gray or brownish gray. Branchlets brownish yellow, spinose. Leaves digitate, 4-foliolate; petiole (0.5–)0.7–1.3(–1.5) cm and persistent on long branchlets, caducous on short branchlets; leaflet blades broadly obovate, 4–13(–17) × 2.5–7 mm, base narrowly cuneate, apex rounded to truncate and shortly cuspidate. Flowers solitary or 2 in a fascicle. Pedicel 5–10 mm, articulate near middle. Calyx tube campanulate-tubular or tubular, 10–14 mm. Corolla yellow; standard obovate, 2.6–3.5 cm, claw ca. 1/3 as long as limb; wings sublinear, claw ca. 3/4 as long as limb, auricle 1/5–1/4 as long as claw; keel obtuse, claw nearly as long as limb, auricle small. Ovary glabrous or rarely with trichomes. Legume cylindric, 3–5 cm, glabrous. Fl. Jul–Aug, fr. Aug. $2n = 16$.

Dry slopes of gullies, stony taluses; 2100–3200 m. Xinjiang [Kazakhstan, Kyrgyzstan].

66. *Caragana frutex* (Linnaeus) K. Koch, Dendrologie 1: 48. 1869.

黄刺条锦鸡儿 huang ci tiao jin ji er

Robinia frutex Linnaeus, Sp. Pl. 2: 723. 1753; *Caragana frutex* var. *latifolia* C. K. Schneider.

Shrubs to 2 m tall. Branches brown, yellowish gray, or dark grayish green. Leaves digitate, 4-foliolate; petiole 2–10 mm and persistent on long branchlets, caducous on short branchlets; leaflet blades obovate-oblanceolate, 6–10 × 3–5 mm, glabrous or sparsely pilose, apex rounded to emarginate. Flowers solitary or 2 in a fascicle. Pedicel 0.9–2.1 cm, articulate apically. Calyx tube tubular-campanulate, 6–8 mm. Corolla yellow, 2–2.2 cm; standard suborbicular, ca. 1.6 cm wide, claw ca. 5 mm; wing with claw ca. 1/2 as long as limb, auricle 1/4–1/3 as long as claw, apex emarginate; keel ca. 2.2 cm, claw shorter than limb, auricle inconspicuous. Ovary glabrous. Legume cylindric, 2–3 cm. Fl. May–Jun, fr. Jul. $2n = 32$.

Dry slopes, woodlands; 1000–2500 m. Xinjiang [Kazakhstan, Mongolia, Russia; E Europe].

