

10. COTONEASTER Medikus, Philos. Bot. 1: 154. 1789.

栒子属 xun zi shu

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Shrubs, rarely small trees, erect, decumbent, or prostrate, deciduous, semievergreen, or evergreen. Branchlets mostly terete, rarely slightly angulate, unarmed. Winter buds small; scales several, imbricate, exposed. Leaves alternate, simple, shortly petiolate; stipules caducous, usually subulate, small; margin of leaf blade entire, venation camptodromous. Inflorescences terminal or axillary, cymose or corymbose, sometimes flowers several fascicled or solitary. Hypanthium turbinate or campanulate, rarely cylindric, adnate to ovary. Sepals 5, persistent, short. Petals 5, erect or spreading, imbricate in bud, white, pink, or red. Stamens 10–20(–22), inserted in mouth of hypanthium. Ovary inferior or semi-inferior, 2–5-loculed; carpels 2–5, connate abaxially, free adaxially; ovules 2 per carpel, erect; styles 2–5, free; stigmas dilated. Fruit a drupe-like pome, red, brownish red, or orange to black, with persistent, incurved, fleshy sepals, containing pyrenes; pyrenes (1 or)2–5, bony, 1-seeded; seeds compressed; cotyledons plano-convex.

About 90 species in the broad sense: widespread in temperate N Africa, Asia (except Japan), Central America (Mexico), and Europe, most abundant in SW China; 59 species (37 endemic) in China.

The shrubs are widely planted as ornamentals for their attractive fruits and flowers, and as borders, hedges, and ground cover. Further studies are necessary to clarify a taxonomy complicated by hybridization and apomixis.

- 1a. Inflorescences compact compound corymbs, more than 20-flowered; petals white, spreading; leaves large, more than 2.5 cm.
 - 2a. Leaf blade abaxially initially pilose, glabrate.
 - 3a. Leaf blade elliptic to ovate, apex obtuse or acute; fruit reddish yellow, ovoid to obovoid, 6–7 mm in diam. 8. *C. glaucophyllus*
 - 3b. Leaf blade oblong-lanceolate to oblong-oblong-lanceolate, apex acuminate or acute; fruit red, globose, 4–5 mm in diam. 9. *C. glabratus*
 - 2b. Leaf blade abaxially persistently densely tomentose.
 - 4a. Deciduous shrub to small tree.
 - 5a. Leaf blade narrowly elliptic to ovate-lanceolate; fruit bright red, ellipsoid, 4–5 mm in diam. 6. *C. frigidus*
 - 5b. Leaf blade ovate or elliptic-ovate; fruit purplish brown to black, ovoid, 6–8 mm in diam. 7. *C. affinis*
 - 4b. Evergreen or semievergreen shrub.
 - 6a. Leaf blade abaxially persistently densely tomentose, apex obtuse or acute.
 - 7a. Inflorescences densely yellow tomentose; fruit obovoid; leaf blade obovate to elliptic 4. *C. coriaceus*
 - 7b. Inflorescences densely gray tomentose; fruit turbinate; leaf blade obovate-lanceolate to oblong-lanceolate 5. *C. turbinatus*
 - 6b. Leaf blade abaxially initially tomentose, glabrescent, apex acute to acuminate.
 - 8a. Pedicel very short or nearly absent; inflorescences 2–3.5 cm; fruit ellipsoid, pyrenes always 2 3. *C. harrovianus*
 - 8b. Pedicel 2–4 mm; inflorescences 3–5 cm; fruit subglobose or pyriform, pyrenes 2–4.
 - 9a. Leaf blade adaxially shallowly rugose, abaxially glaucous and tomentose; fruit subglobose 1. *C. salicifolius*
 - 9b. Leaf blade adaxially deeply rugose, abaxially yellow tomentose; fruit pyriform 2. *C. rhytidophyllus*
- 1b. Inflorescences lax corymbs, fewer than 20-flowered, sometimes reduced to a solitary flower; petals pink and erect, or white and spreading; leaves often smaller.
 - 10a. Corymb 3–15(–20)-flowered, sometimes reduced to a solitary flower; leaf blade longer than 2 cm, rarely slightly shorter.
 - 11a. Petals white, spreading; fruit red.
 - 12a. Leaf blade abaxially glabrous or slightly pilose.
 - 13a. Pedicel and abaxial surfaces of leaf blade and hypanthium sparsely pilose 15. *C. submultiflorus*
 - 13b. Pedicel and abaxial surfaces of leaf blade and hypanthium glabrous 16. *C. multiflorus*
 - 12b. Leaf blade abaxially tomentose, rarely tomentose-villous.
 - 14a. Hypanthium abaxially glabrous.
 - 15a. Leaf blade oblong-elliptic, abaxially gray tomentose, sometimes adaxially initially pubescent; petals 3.5–4 mm; fruit purplish red, with slightly glaucous bloom, obovoid 13. *C. mongolicus*
 - 15b. Leaf blade elliptic to broadly ovate, abaxially tomentose-villous, with glaucous bloom, always adaxially glabrous; petals 5–6 mm; fruit dark red, ovoid, rarely oblong 14. *C. hebeophyllus*
 - 14b. Hypanthium abaxially tomentose or villous.
 - 16a. Semievergreen shrub; anthers purplish red; leaf blade leathery; fruit with 2 pyrenes 10. *C. pannosus*
 - 16b. Deciduous shrub; anthers yellow; leaf blade herbaceous; fruit with 1 or 2 pyrenes.
 - 17a. Leaf blade apically obtuse, abaxially white tomentose; hypanthium abaxially tomentose; petals

- 2.5–3.5 mm; fruit ovoid to ellipsoid 11. *C. soongoricus*
- 17b. Leaf blade apically acute, rarely obtuse, abaxially gray tomentose; hypanthium abaxially villous; petals 4–5 mm; fruit subglobose 12. *C. silvestrii*
- 11b. Petals pink, very rarely white, erect; fruit red, rarely black (*C. melanocarpus*, *C. tenuipes*).
- 18a. Leaf blade abaxially tomentose; fruit red, rarely black.
- 19a. Hypanthium abaxially glabrous or slightly puberulous.
- 20a. Fruit black; inflorescences 3–15-flowered, rachis tomentose 29. *C. melanocarpus*
- 20b. Fruit red; inflorescences 2–7-flowered, rachis glabrous to pilose.
- 21a. Hypanthium abaxially puberulous; flowers 2–4 in short fascicles, nearly 1/2 as long as leaves 26. *C. oliganthus*
- 21b. Hypanthium abaxially glabrous; flowers 2–7 in corymbs.
- 22a. Inflorescences nearly 1/2 as long as leaves; rachis and pedicels glabrous, rarely puberulous; leaf blade broadly elliptic, broadly ovate, or suborbicular; fruit subglobose, rarely ovoid, glabrous 27. *C. integerrimus*
- 22b. Inflorescences nearly as long as leaves; rachis and pedicels pilose; leaf blade ovate to oblong-ovate; fruit obovoid, puberulous 28. *C. gracilis*
- 19b. Hypanthium abaxially densely tomentose or pilose.
- 23a. Leaf blade apically obtuse, rarely acute.
- 24a. Fruit black, ovoid, with 1 or 2 pyrenes; inflorescences 2–4-flowered 19. *C. tenuipes*
- 24b. Fruit red, globose to ovoid or obovoid, with 2 or 3 pyrenes; inflorescences 3–15-flowered.
- 25a. Leaf blade elliptic to ovate; inflorescences 3- to more than 10-flowered; fruit obovoid or ovoid-globose, with 2 pyrenes 17. *C. zabelii*
- 25b. Leaf blade broadly ovate to suborbicular; inflorescences 10–15-flowered; fruit oblong, with 3 pyrenes 18. *C. fangianus*
- 23b. Leaf blade apically acute to acuminate.
- 26a. Rachis, pedicels, and hypanthium abaxially glabrous; fruit purplish black, subglobose, with 5 pyrenes 25. *C. reticulatus*
- 26b. Rachis, pedicels, and hypanthium abaxially pubescent; fruit red or orangish red, obovoid, ovoid, or subglobose, with 2–5 pyrenes.
- 27a. Rachis, pedicels, and hypanthium abaxially densely white tomentose; petals white; fruit obovoid, pyrenes 2 20. *C. wardii*
- 27b. Rachis, pedicels, and hypanthium abaxially pilose; petals usually pink, sometimes white or red; fruit subglobose to obovoid, pyrenes 3–5 or if pyrenes 2, then fruit ovoid.
- 28a. Inflorescences 5–11-flowered; fruit orangish red, with 3–5 pyrenes 24. *C. franchetii*
- 28b. Inflorescences 3–7(–11)-flowered; fruit dark or bright red, with 2–5 pyrenes.
- 29a. Fruit ovoid, dark red, with 2 or 3 pyrenes; petals red 23. *C. obscurus*
- 29b. Fruit subglobose or obovoid, bright red, with 3–5 pyrenes; petals white or pink.
- 30a. Inflorescences 2-flowered; petals pink; leaf blade elliptic to ovate, abaxially densely tomentose; fruit subglobose or obovoid, with 3–5 pyrenes 21. *C. dielsianus*
- 30b. Inflorescences 3–11-flowered; petals white; leaf blade ovate-lanceolate to oblong-ovate, abaxially sparsely tomentose; fruit subglobose, with 5 pyrenes 22. *C. glomerulatus*
- 18b. Leaf blade abaxially glabrous or pilose.
- 31a. Fruit red.
- 32a. Hypanthium abaxially glabrous when old; flowers 5–13 in corymbs; leaf blade adaxially conspicuously rugose, veins prominently raised abaxially; styles 4 or 5; fruit with 4 or 5 pyrenes 33. *C. bullatus*
- 32b. Hypanthium abaxially slightly puberulous; flowers 1–9; leaf blade adaxially not rugose, veins raised but not prominently; styles 2; fruit with 2 pyrenes.
- 33a. Flowers (1 or) 2 or 3(–5); leaf blade elliptic-ovate to ovate-lanceolate, adaxially pilose; fruit ellipsoid 30. *C. acuminatus*
- 33b. Flowers 3–9; leaf blade elliptic-lanceolate, adaxially glabrous or initially pilose, glabrescent; fruit subglobose or obovoid.
- 34a. Leaf blade elliptic-lanceolate; fruit subglobose, glabrous 31. *C. nitidifolius*
- 34b. Leaf blade broadly elliptic or broadly ovate, sometimes obovate or suborbicular; fruit obovoid, pilose or subglabrous 32. *C. schantungensis*
- 31b. Fruit black.
- 35a. Hypanthium abaxially glabrous or subglabrous; inflorescences 5–10-flowered; fruit ovoid or subglobose 37. *C. ambiguus*
- 35b. Hypanthium abaxially pilose; inflorescences 2–25-flowered; fruit ellipsoid, obovoid, or subglobose.
- 36a. Leaf blade apically acute; inflorescences 2–5-flowered; fruit ellipsoid or obovoid, with 2 or 3

- pyrenes 34. *C. acutifolius*
- 36b. Leaf blade apically acuminate; inflorescences 3–25-flowered; fruit subglobose or obovoid, with 3–5 pyrenes.
- 37a. Inflorescences 9–25-flowered; leaf blade adaxially rugose and conspicuously bullate; pyrenes 4 or 5, smooth 35. *C. moupinensis*
- 37b. Inflorescences 3–7-flowered; leaf blade adaxially not bullate, veins slightly impressed; pyrenes 3 or 4, furrowed and shallowly pitted on back 36. *C. foveolatus*
- 10b. Inflorescences solitary flowers, rarely 2- or 3(–7)-flowered (but 3–9(–11)-flowered in *C. sherriffii*); leaf blade often less than 2 cm, rarely slightly longer.
- 38a. Petals white, spreading; fruit red, with 2 or 3(–5) pyrenes; prostrate or low evergreen shrub.
- 39a. Abaxial surfaces of leaf blade and hypanthium tomentose 38. *C. buxifolius*
- 39b. Abaxial surfaces of leaf blade and hypanthium pilose.
- 40a. Leaf blade ovate or oblong-ovate to elliptic, rarely obovate; fruit with 2–5 pyrenes.
- 41a. Leaf blade elliptic to oblong-elliptic, 1–2(–3) cm; fruit subglobose, with 4 or 5 pyrenes 39. *C. dammeri*
- 41b. Leaf blade ovate or oblong-ovate, rarely obovate, 0.9–1.5 cm; fruit ellipsoid-ovoid or ellipsoid, with 2 or 3 pyrenes 40. *C. morrisonensis*
- 40b. Leaf blade suborbicular, ovate, obovate, or elliptic to oblanceolate; fruit with 1 or 2 pyrenes.
- 42a. Leaf blade elliptic, oblong or obovate to oblong-obovate, rarely oblanceolate, base cuneate.
- 43a. Flowers solitary, rarely 2 or 3; shrub prostrate or suberect; leaf blade obovate to oblong-obovate, margin slightly revolute.
- 44a. Prostrate shrubs; leaf blade obovate to oblong-obovate, 4–10 mm; fruit scarlet-red, 5–7 mm in diam. 41. *C. microphyllus*
- 44b. Suberect shrubs; branches spreading to 40 cm; leaf blade elliptic to oblanceolate, rarely oblong, 6–16(–20) mm; fruit bright scarlet, 8–10 mm in diam. 42. *C. conspicuus*
- 43b. Flowers 3–9(–11); shrub erect; leaf blade oblong-obovate, rarely oblanceolate, margin not revolute 43. *C. sherriffii*
- 42b. Leaf blade suborbicular or broadly ovate, base broadly cuneate to rounded.
- 45a. Leaf blade adaxially glabrous, abaxially pilose; flowers 1–3, petals white or tinged reddish, spreading; fruit red, obovoid, with 2 or 3 pyrenes 44. *C. rotundifolius*
- 45b. Leaf blade villous on both surfaces; flowers solitary, petals pink, erect; fruit dark red, ovoid-globose, with 2 pyrenes 51. *C. langei*
- 38b. Petals red, rarely pink, erect; fruit red, rarely purplish black, with (1 or)2 or 3(or 4) pyrenes; spreading or erect, deciduous or semievergreen shrub.
- 46a. Leaf blade abaxially densely tomentose; flowers usually solitary.
- 47a. Petals red; hypanthium abaxially pilose; leaf blade suborbicular or broadly elliptic, apex obtuse, abaxially persistently yellow tomentose 45. *C. rubens*
- 47b. Petals pink; hypanthium abaxially glabrous; leaf blade ovate, rarely ovate-elliptic, apex acute or obtuse, abaxially tomentose, gradually glabrescent, subglabrous when old 46. *C. uniflorus*
- 46b. Leaf blade abaxially glabrous or pilose; flowers 1–3(or 4).
- 48a. Hypanthium abaxially glabrous; erect shrub.
- 49a. Stems irregularly branched; fruit subglobose, sessile, erect.
- 50a. Leaf apically apiculate, rarely emarginate, blade suborbicular or orbicular-ovate, rarely broadly obovate, glabrous on both surfaces or slightly puberulous only along veins abaxially; petals pinkish 58. *C. apiculatus*
- 50b. Leaf apically acute, sometimes obtuse, blade ovate or elliptic-ovate, pilose on both surfaces; petals red 59. *C. sanguineus*
- 49b. Stems ± distichously branched; fruit obovoid or globose, shortly pedicellate, pendent.
- 51a. Branchlets conspicuously verruculose; leaf apically emarginate or partly mucronulate; flowers solitary 57. *C. verruculosus*
- 51b. Branchlets strigose, not verruculose; leaf apically acute or obtuse; flowers 1–3.
- 52a. Flowers solitary; stamens 20; leaf blade broadly ovate or broadly obovate, apex acute, rarely obtuse 55. *C. nitidus*
- 52b. Flowers 2 or 3; stamens 10; leaf blade suborbicular or broadly ovate, apex obtuse or acute 56. *C. taylorii*
- 48b. Hypanthium abaxially pubescent; prostrate or erect shrub.
- 53a. Prostrate low shrub; flowers solitary or in pairs.
- 54a. Stems horizontally spreading, regularly distichously branched 49. *C. horizontalis*
- 54b. Stems tufted on ground, irregularly branched.
- 55a. Leaf blade thinly papery, margin undulate; fruit subglobose, 7–9 mm in diam., pyrenes 2 or 3 47. *C. adpressus*

- 55b. Leaf blade leathery, margin thick, not undulate; fruit ovoid, 5–6 mm in diam., pyrenes 2 48. *C. subadpressus*
 53b. Erect shrub; flowers 2 or 3 (or 4).
 56a. Fruit black.
 57a. Leaf apically obtuse, rarely acute, blade ovate, rarely elliptic, adaxially glabrous, abaxially
 villous or subglabrous; fruit ellipsoid, pyrenes 1 or 2 53. *C. nitens*
 57b. Leaf apically acute to acuminate, blade elliptic to ovate-elliptic, both surfaces appressed
 strigose-villous; fruit ovoid or subglobose, pyrenes 2 or 3 54. *C. harrysmithii*
 56b. Fruit red.
 58a. Branchlets verruculose; leaf blade appressed pilose on both surfaces; fruit with 3
 pyrenes 52. *C. chengkangensis*
 58b. Branchlets not verruculose; leaf blade strigose-villous or subglabrous, fruit with 2 pyrenes.
 59a. Leaf blade elliptic or broadly elliptic, rarely obovate, abaxially slightly puberulous,
 adaxially subglabrous, apex acute, rarely ± obtuse; fruit ellipsoid, shortly stalked 50. *C. divaricatus*
 59b. Leaf blade broadly ovate to suborbicular, both surfaces strigose-villous, apex obtuse, rarely
 acute; fruit ovoid-globose, subsessile 51. *C. langei*

1. *Cotoneaster salicifolius* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 8: 225. 1885.

柳叶栒子 *liu ye xun zi*

Shrubs evergreen, rarely semievergreen, to 5 m tall, with spreading to erect branches. Branchlets reddish brown to grayish brown, initially densely tomentose, glabrescent. Petiole often red, robust, 4–5 mm, tomentose; stipules caducous, brown, linear or linear-lanceolate, 4–7 mm, membranous, tomentulose; leaf blade elliptic-oblong to ovate-lanceolate or linear-lanceolate, 4–8.5 × 1.5–2.5 cm, lateral veins 12–16 pairs, prominently raised abaxially and impressed adaxially, abaxially gray tomentose, with bloom, adaxially glabrous or pilose, rugose, base cuneate, margin entire, revolute or not, apex acute or acuminate. Compound corymbs 3.5–6 × 3–4 cm, many flowered; rachis and pedicels densely gray tomentose; bracts caducous, linear, 3–5 mm, tomentulose. Pedicel 2–4 mm. Flowers 5–6 mm in diam. Hypanthium campanulate, abaxially gray tomentose. Sepals triangular, 1.5–2.5 mm, apex acute to shortly acuminate. Petals spreading, white, ovate or suborbicular, 2.5–4 × 3–4 mm, glabrous, base shortly clawed, apex obtuse. Stamens 20, slightly longer than or nearly as long as petals; anthers purple. Ovary pilose apically; styles 2 or 3, free, somewhat not exceeding stamens. Fruit scarlet, subglobose, obovoid, or ovoid, 3–7 mm in diam.; pyrenes 2 or 3. Fl. Jun, fr. Oct. $2n = 34^*$.

• Mountain regions, mixed forests, slopes, open places; 400–3000 m. Guizhou, Hubei, Hunan, Sichuan, Yunnan.

- 1a. Leaf blade narrow, linear-lanceolate, adaxially glabrous, deeply rugose, margin revolute, veins deeply impressed, abaxially floccose-tomentose; fruit obovoid, 3–4 mm in diam., with 2 pyrenes 1d. var. *angustus*
 1b. Leaf blade broader, elliptic-oblong or ovate-lanceolate, adaxially pilose or glabrous, margin not revolute or revolute, veins slightly to deeply impressed, abaxially gray tomentose; fruit subglobose or ovoid, 5–7 mm in diam., with 2 or 3 pyrenes.
 2a. Leaf blade adaxially pilose, veins slightly impressed; fruit ovoid 1c. var. *henryanus*
 2b. Leaf blade adaxially glabrous, veins deeply impressed; fruit subglobose.

- 3a. Leaf blade adaxially shallowly rugose, margin not revolute, veins slightly impressed 1a. var. *salicifolius*
 3b. Leaf blade adaxially deeply rugose, margin revolute, veins deeply impressed 1b. var. *rugosus*

1a. *Cotoneaster salicifolius* var. *salicifolius*

柳叶栒子(原变种) *liu ye xun zi* (*yuan bian zhong*)

Cotoneaster floccosus (Rehder & E. H. Wilson) Flink & Hylmö; *C. salicifolius* var. *floccosus* Rehder & E. H. Wilson.

Leaf blade elliptic-oblong or ovate-lanceolate, abaxially shallowly rugose, veins slightly impressed. Fruit subglobose, 5–7 mm in diam. $2n = 34^*$.

• Mountain regions, mixed forests along river banks; 1800–3000 m. Guizhou, Hubei, Hunan, Sichuan, Yunnan.

1b. *Cotoneaster salicifolius* var. *rugosus* (E. Pritzel) Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 172. 1912.

皱叶柳叶栒子 *zou ye liu ye xun zi*

Cotoneaster rugosus E. Pritzel, Bot. Jahrb. Syst. 29: 385. 1900; *C. hylmoei* Flink & J. Fryer.

Leaf blade elliptic-oblong, adaxially deeply rugose, margin revolute, veins deeply impressed. Fruit subglobose, ca. 6 mm in diam. $2n = 68^*$.

• Slopes; 400–1900 m. W Hubei, E Sichuan.

1c. *Cotoneaster salicifolius* var. *henryanus* (C. K. Schneider) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 121. 1974.

大叶柳叶栒子 *da ye liu ye xun zi*

Cotoneaster rugosus E. Pritzel var. *henryanus* C. K. Schneider, Ill. Handb. Laubholz. 1: 758. 1906; *C. henryanus* (C. K. Schneider) Rehder & E. H. Wilson.

Leaf blade elliptic-oblong, adaxially pilose, veins slightly impressed. Fruit ovoid, 5–7 mm in diam. $2n = 34^*$.

• Open places; 700–1900 m. W Hubei, Sichuan.

1d. *Cotoneaster salicifolius* var. *angustus* T. T. Yu, Acta Phytotax. Sin. 8: 219. 1963.

窄叶柳叶栒子 zhai ye liu ye xun zi

Cotoneaster angustus (T. T. Yu) G. Klotz.

Leaf blade linear-lanceolate, abaxially glabrous, deeply rugose, margin revolute, veins deeply impressed. Fruit obovoid, 3–4 mm in diam.

• Mixed forests; 1400–1600 m. W Sichuan.

2. *Cotoneaster rhytidophyllus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 175. 1912.

麻叶栒子 ma ye xun zi

Shrubs evergreen or semievergreen, to 2 m tall. Branchlets reddish brown, terete, stout, initially densely yellow tomentose, glabrous when old. Petiole robust, 3–5 mm, densely yellow tomentose; stipules caducous, reddish, membranous, pilose; leaf blade yellowish green adaxially, elliptic-oblong or ovate-oblong to oblong-lanceolate, 4–7 × (1.3–)1.8–3 cm, thickly leathery, midvein conspicuously raised abaxially and deeply impressed adaxially, lateral veins 5–8 pairs, abaxially densely yellow tomentose, adaxially deeply rugose, initially sparsely villous, glabrescent, base cuneate, margin revolute, apex acuminate, rarely acute. Compound corymbs 3–4 cm, many flowered; rachis and pedicels densely yellow tomentose; bracts linear, pilose. Pedicel 2–4 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially densely yellow tomentose. Sepals triangular, apex acute. Petals spreading, white, broadly obovate to suborbicular, adaxially slightly pilose near base, base clawed, apex obtuse. Stamens 20, longer than or ca. as long as petals. Ovary pilose apically; styles 2(or 3), free, nearly as long as stamens. Fruit orangish red, pyriform, 5–6 × 4–5 mm; pyrenes 2–4. Fl. May–Jun, fr. Sep–Oct.

• Rocky mountains, cliffs, forests, waste places, dry places; 1200–2600 m. Guizhou, Sichuan.

3. *Cotoneaster harrovianus* E. H. Wilson, Gard. Chron., ser. 3, 51: 3. 1912.

蒙自栒子 meng zi xun zi

Shrubs evergreen, 1.5–2 m tall, much branched. Branchlets dark brown, initially yellowish gray appressed tomentose, glabrous when old. Petiole 4–5 mm, pilose; stipules lanceolate, 4–5 mm, membranous, pilose; leaf blade elliptic-oblong or ovate, rarely obovate-oblong, 2.5–5 × 1.2–2 cm, subleathery, midvein prominently raised abaxially and impressed adaxially, lateral veins 8–10 pairs, abaxially initially densely tomentose, glabrous when old, with glaucous bloom, adaxially initially puberulous, later subglabrous, slightly rugose, base cuneate, apex acute or shortly acuminate. Compound corymbs 2–3.5 × 3–5 cm, densely many flowered; rachis and pedicels densely villous; bracts linear-lanceolate or subulate, 3–5 mm, pubescent. Pedicel very short or nearly absent. Flowers 5–6 mm in diam. Hypanthium campanulate, abaxially densely tomentose. Sepals triangular, 1.5–2 mm, apex acute. Petals spreading, broadly ovate or suborbicular, 2–3 × 2–2.5 mm, puberulous near base, base nearly not clawed, apex obtuse and erose. Stamens 20, slightly shorter than petals; anthers purple, capitate. Ovary pilose apically; styles 2, free, nearly as long as stamens. Fruit dark red, ellipsoid, 7–8 mm in diam.; pyrenes usually 2.

Fl. May–Jun, fr. Aug–Sep.

• Waste places or slopes; 1500–1600 m. SE Yunnan.

4. *Cotoneaster coriaceus* Franchet, Pl. Delavay. 222. 1890.

厚叶栒子 hou ye xun zi

Cotoneaster lacteus W. W. Smith; *C. oligocarpus* C. K. Schneider; *C. smithii* G. Klotz.

Shrubs evergreen, 1–3 m tall. Branchlets dark purplish brown to grayish brown, cylindrical, initially densely yellow tomentose, glabrous when old. Petiole 4–8 mm, initially densely yellow tomentose, subglabrous when old; stipules linear-lanceolate, 4–5 mm, sparsely tomentose or glabrescent at fruiting; leaf blade obovate to elliptic, 2–4.5 × 1.2–2.8 cm, thickly leathery, midvein prominently raised abaxially and deeply impressed adaxially, lateral veins 7–10 pairs, abaxially densely yellow tomentose, adaxially lustrous, glabrous, base cuneate, margin entire, apex obtuse or acute and mucronate. Compound corymbs 3–5(–6) × 4–7 cm, densely many small flowered; rachis and pedicels densely yellow tomentose; bracts caducous, linear-lanceolate, 2–4 mm, slightly tomentose. Pedicel 1–2 mm. Flowers 4–5 mm in diam. Hypanthium campanulate, densely tomentose. Sepals triangular, 1.5–2 mm, apex acute. Petals spreading, white, broadly ovate or suborbicular, 2.5–3.5 × 2.5–3 mm, adaxially tomentulose near base, base shortly clawed, apex obtuse. Stamens 20, shorter than petals. Ovary tomentose apically; styles 2, free, nearly as long as stamens. Fruit red, obovoid, 4–6 × 4–5 mm, sparsely tomentulose; pyrenes 2. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Grassy slopes along river sides or thickets; 1800–2700 m. Guizhou, Sichuan, Xizang, Yunnan.

5. *Cotoneaster turbinatus* Craib, Bot. Mag. 140: t. 8546. 1914.

陀螺果栒子 tuo luo guo xun zi

Shrubs evergreen, 3–5 m tall, with spreading branches. Branchlets grayish brown to blackish brown, initially densely gray tomentose, glabrous when old. Petiole 4–7 mm, tomentose; stipules caducous or partly persistent, brownish, linear, 3–5 mm, tomentose; leaf blade obovate-lanceolate to oblong-lanceolate, 2.5–5 × 1–2 cm, midvein distinctly raised abaxially and impressed adaxially, lateral veins 8–10 pairs, abaxially densely gray tomentose, adaxially glabrous or with few white soft hairs along midvein, base cuneate, apex acute and abruptly mucronate. Compound corymbs 2.5–4.5 × 4–5 cm, many flowered; rachis and pedicels densely gray tomentose; bracts linear, 2–4 mm, tomentose. Pedicel 2–5 mm. Flowers 5–6 mm in diam. Hypanthium campanulate, abaxially gray tomentose. Sepals triangular, 1.5–2 mm, apex acute. Petals spreading, milky white, ovate or suborbicular, 2–3 mm in diam., adaxially puberulous near base, base shortly clawed, apex obtuse. Stamens 20, slightly shorter than petals. Ovary pilose apically; styles 2, free, ca. as long as stamens. Fruit pendent, dark red, turbinate, 4–5 mm, tomentose; pyrenes 2. Fl. Jun–Jul, fr. Sep–Oct.

• River banks, river valleys, gullies; 1800–2700 m. Guizhou, Hubei, Sichuan, Yunnan.

6. *Cotoneaster frigidus* Wallich ex Lindley, Bot. Reg. 15: t.

1229. 1829.

耐寒栒子 *nai han xun zi*

Cotoneaster himalaiensis Hortorum ex Zabel.

Shrubs or small trees, deciduous, to 10 m tall, with spreading branches. Branchlets purplish brown or grayish brown, angulate, initially tomentose, glabrescent. Petiole 4–7 mm, tomentose; stipules brown, linear-lanceolate, 4–6 mm, tomentulose; leaf blade narrowly elliptic to ovate-lanceolate, 3.5–8(–12) × 1.5–3(–4.5) cm, veins raised abaxially and slightly impressed adaxially, abaxially initially tomentose, gradually glabrescent, subglabrous when old, adaxially usually glabrous, base cuneate to broadly cuneate, apex acute or obtuse, sometimes mucronate with spiniform point. Compound corymbs dense, 4–6 × 3–5 cm, ca. 20–40-flowered; rachis and pedicels densely tomentose; bracts linear-lanceolate, 3–5 mm, tomentose. Pedicel 2–4 mm. Flowers 6–7 mm in diam. Hypanthium campanulate or shortly subcylindric, abaxially densely tomentose. Sepals triangular, 1–1.5 × 1.5–2 mm, apex obtuse. Petals spreading, white, broadly ovate or suborbicular, 3–3.5 mm and nearly as broad, glabrous or puberulous adaxially near base, base shortly and broadly clawed, apex obtuse, rarely somewhat emarginate. Stamens 18–20, slightly shorter than petals. Ovary densely tomentose apically; styles 2, free, not exceeding stamens. Fruit bright red, ellipsoid, 4–5 mm in diam.; pyrenes 2. Fl. Mar–May, fr. Sep–Oct. $2n = 34$.

River valleys, broad-leaved deciduous forests on slopes; 2800–3300 m. Xizang [Bhutan, N India, Nepal, Sikkim].

7. *Cotoneaster affinis* Lindley, Trans. Linn. Soc. London 13: 101. 1822.

藏边栒子 *zang bian xun zi*

Cotoneaster bacillaris Lindley var. *affinis* (Lindley) J. D. Hooker; *C. frigidus* Lindley var. *affinis* (Lindley) Wenzig; *Mespilus affinis* (Lindley) D. Don.

Shrubs deciduous, to 5 m tall. Branchlets dark reddish brown, terete. Petiole 4–5 mm, densely yellow tomentose; stipules linear or lanceolate, tomentulose; leaf blade ovate or elliptic-ovate, 2.5–5 × 1.4–2 cm, midvein raised abaxially and impressed adaxially, abaxially densely yellow tomentose, gradually glabrescent, adaxially glabrous or puberulous only along midvein, base broadly cuneate, apex obtuse or acute. Compound corymbs 3–4 cm in diam., 15–30-flowered or more; rachis and pedicels densely yellow tomentose; bracts linear-lanceolate, tomentose. Pedicel 2–3 mm. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially tomentose. Sepals broadly triangular, apex acute. Petals spreading, white, suborbicular or ovate, 3–4 mm, adaxially pubescent near base, base shortly clawed, apex obtuse. Stamens 20, shorter than sepals. Ovary densely tomentose apically; styles 2, free, not exceeding stamens. Fruit purplish brown to black, ovoid, 6–8 mm in diam.; pyrenes 2. Fl. May–Jun, fr. Sep–Oct.

Slopes, mixed forests, thickets of river valleys; 1100–3900 m. SW Sichuan, S Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Sikkim].

8. *Cotoneaster glaucophyllus* Franchet, Pl. Delavay. 222. 1890.

粉叶栒子 *fen ye xun zi*

Shrubs semievergreen, 2–5 m tall, much branched. Branchlets robust, dark grayish brown, terete, initially densely yellow pubescent, glabrous when old. Petiole thick, 4–6 mm, initially yellow pubescent, later glabrous; stipules mostly caducous, lanceolate, 4–5 mm, puberulous; leaf blade elliptic or narrowly elliptic to ovate, (1.5–)3–6 × 1.5–2.5 cm, lateral veins 5–8 pairs, abaxially initially slightly pubescent or tomentose, glabrescent, with bloom, adaxially glabrous, base broadly cuneate to rounded, apex acute or obtuse. Compound corymbs to 3–5 cm, densely 6–12- or 40–50-flowered or more; rachis and pedicels pubescent or tomentose; bracts caducous, subulate, 2–3 mm, slightly pubescent. Pedicel 2–4 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially pilose. Sepals triangular, 1–2 × 1.5–2.5 mm, apex acute. Petals spreading, white, suborbicular or broadly obovate, 3–4 mm, adaxially puberulous near base, base shortly clawed, apex obtuse, rarely emarginate. Stamens 20, ca. as long as petals. Ovary puberulous apically; styles 2, free, nearly equaling or lower than stamens. Fruit reddish yellow, ovoid to obovoid, 6–7 mm in diam., glabrous when mature; pyrenes usually 2. Fl. Jun–Jul, fr. Sep–Oct.

• Mixed forests, thickets, clearings, mountain regions and valleys; 1200–3000 m. Guangxi, Guizhou, Sichuan, Yunnan.

- 1a. Leaf blade 3–6 cm, abaxially white tomentose or with soft yellow hairs.
 - 2a. Inflorescences with soft yellow hairs, to 40-flowered 8a. var. *glaucophyllus*
 - 2b. Inflorescences initially white tomentose, glabrescent, to more than 50-flowered 8b. var. *serotinus*
- 1b. Leaf blade 1.5–3 cm, abaxially yellow tomentose or slightly pubescent.
 - 3a. Leaf blade abaxially initially densely yellow tomentose, glabrescent; inflorescences up to 40-flowered, larger, initially densely white tomentose 8c. var. *vestitus*
 - 3b. Leaf blade abaxially slightly pubescent or subglabrous; inflorescences 6–12-flowered, smaller, with soft hairs 8d. var. *meiophyllus*

8a. *Cotoneaster glaucophyllus* var. *glaucophyllus*

粉叶栒子(原变种) *fen ye xun zi* (yuan bian zhong)

Cotoneaster transens G. Klotz; *Photinia rosifoliolata* H. Léveillé.

Leaf blade 3–6 cm, abaxially initially slightly pubescent, later glabrous. Inflorescences to 40-flowered, with soft yellow hairs.

• Mixed forests on slopes, clearings; 1200–2800 m. Guangxi, Guizhou, Sichuan, Yunnan.

8b. *Cotoneaster glaucophyllus* var. *serotinus* (Hutchinson) L. T. Lu & A. R. Brach, Novon 12: 495. 2002.

多花粉叶栒子 *duo hua fen ye xun zi*

Cotoneaster serotinus Hutchinson, Bot. Mag. 146: t. 8854.

1920; *C. glaucophyllus* f. *serotinus* (Hutchinson) Stapf.

Leaf blade 4–6 cm, abaxially initially pubescent, gradually glabrescent. Inflorescences to more than 50-flowered, initially white tomentose, glabrescent.

- Mountain regions; 1900–3000 m. W Yunnan.

8c. *Cotoneaster glaucophyllus* var. *vestitus* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 21. 1917.

毛萼粉叶栒子 *mao e fen ye xun zi*

Cotoneaster vestitus (W. W. Smith) Flinck & Hylmö.

Leaf blade 2–2.5 × 1–2 cm, abaxially initially densely yellow tomentose, glabrescent. Inflorescences relatively large, to 40-flowered, initially densely white tomentose, glabrescent.

- Mixed forests, thickets, mountain regions; 2000–3000 m. W Yunnan.

8d. *Cotoneaster glaucophyllus* var. *meiophyllus* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 21. 1917.

小叶粉叶栒子 *xiao ye fen ye xun zi*

Cotoneaster arbusculus G. Klotz; *C. meiophyllus* (W. W. Smith) G. Klotz.

Leaf blade 1.5–3 × 1–2 cm, abaxially slightly pubescent or subglabrous. Inflorescences relatively small, 6–12-flowered, with soft hairs.

- Mountain valleys; 1900–2400 m. W Yunnan.

9. *Cotoneaster glabratus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 171. 1912.

光叶栒子 *guang ye xun zi*

Shrubs semievergreen, 3–5 m tall. Branchlets robust, purplish red to purplish black, terete, slightly angulate, initially sparsely appressed pubescent, gradually glabrescent. Petiole 5–7 mm, initially puberulous, later glabrous; stipules caducous, brown, lanceolate, 4–5 mm, membranous; leaf blade oblong-lanceolate to oblong-oblong-lanceolate, 4–9 × 1.5–3.3 cm, leathery, midvein slightly raised abaxially, lateral veins 7–10 pairs, abaxially with bloom, initially puberulous, glabrate, adaxially lucid, glabrous, base cuneate, apex acuminate or acute. Compound corymbs 3–6 × 3–5.5 cm, densely many flowered; rachis and pedicels sparsely pilose; peduncles 1.5–2.5 cm; bracts caducous, lanceolate, 3–5 mm, membranous, puberulous. Pedicel 2–3 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially sparsely pilose. Sepals ovate-triangular, 1–2 mm, apex acute. Petals spreading, white, ovate or suborbicular, 2.5–3 × 2–3 mm, glabrous, base shortly clawed, apex rounded. Stamens 20, unequal in length; anthers purple. Ovary puberulous apically; styles 2, free, somewhat not exceeding stamens. Fruit red, globose, 4–5 mm in diam.; pyrenes usually 2. Fl. Jun–Jul, fr. Sep–Oct.

- Rocky slopes, dense forests; 1600–2800 m. Guizhou, Hubei, Sichuan, Yunnan.

10. *Cotoneaster pannosus* Franchet, Pl. Delavay. 223. 1890.

毡毛栒子 *zhan mao xun zi*

Shrubs semievergreen, to 2 m tall. Branchlets dark grayish brown or purplish brown, thin, initially densely white tomentose, glabrescent. Petiole 2–7 mm, tomentose; stipules caducous, linear, pubescent; leaf blade narrowly elliptic, elliptic, or ovate, 2–3(–4) × 0.8–1.5 cm, leathery, midvein impressed adaxially, lateral veins 4–6 pairs, abaxially densely white tomentose, adaxially slightly pubescent or glabrous, base broadly cuneate, apex obtuse or acute. Corymbs 1–3 × 1.5–2.5 cm, to 10(–20)-flowered; rachis and pedicels densely tomentose; bracts caducous, linear, pubescent. Pedicel 2–3 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially densely tomentose. Sepals triangular, apex shortly acuminate or acute. Petals spreading, white, broadly ovate or suborbicular, 3–3.5 mm, base shortly clawed and puberulous adaxially, apex obtuse. Stamens 20, nearly as long as petals; anthers purplish red. Ovary pubescent apically; styles 2(or 3), free, ca. as long as stamens. Fruit dark red, globose or ovoid, 7–8 mm in diam.; pyrenes often 2. Fl. Jun, fr. Oct–Nov. $2n = 34^*$, 68^* .

- Thickets, rocky places, waste places in mountain regions, slopes; 1100–3200 m. Sichuan, Yunnan.

1a. Leaf blade elliptic or ovate, 2–3 cm 10a. var. *pannosus*

1b. Leaf blade narrowly elliptic, to 3–4 cm 10b. var. *robustior*

10a. *Cotoneaster pannosus* var. *pannosus*

毡毛栒子(原变种) *zhan mao xun zi* (*yuan bian zhong*)

Cotoneaster vernae C. K. Schneider.

Leaf blade elliptic or ovate, 2–3 cm, relatively broad. $2n = 68^*$.

- Thickets, rocky places, waste places in mountain regions; 1100–3200 m. Sichuan, Yunnan.

10b. *Cotoneaster pannosus* var. *robustior* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 24. 1917.

大叶毡毛栒子 *da ye zhan mao xun zi*

Cotoneaster robustior (W. W. Smith) Flinck & Hylmö.

Leaf blade narrowly elliptic, to 3–4 cm, relatively narrow.

- Thickets, slopes; 1800–2200 m. NW Yunnan.

11. *Cotoneaster soongoricus* (Regel & Herder) Popov, Bull. Soc. Imp. Naturalistes Moscou, n.s., 44: 128. 1935.

准噶尔栒子 *zhun ga er xun zi*

Shrubs deciduous, 1–2.5 m tall, with spreading or ascending branches. Branchlets grayish brown or reddish brown, terete, slender, initially densely gray tomentose, glabrous when old. Petiole (1.5–)2–5 mm, tomentose; leaf blade oblong to elliptic, suborbicular, or ovate, rarely obovate, (1–)1.5–5 × 1–2 cm, herbaceous, veins raised abaxially and slightly impressed adaxially, abaxially white tomentose, adaxially glabrous or slightly pilose, base rounded or broadly cuneate, apex usually obtuse and mucronate, sometimes emarginate. Corymbs 1.5–2 cm, 3–12-flowered; rachis and pedicels white tomentose. Pedicel 2–3 mm. Flowers 8–9 mm in diam. Hypanthium campan-

ulate, abaxially tomentose. Sepals broadly triangular, 1–2 mm, subglabrous or glabrous, apex acute. Petals spreading, white, ovate to suborbicular, 2.5–3.5 × 2–3 mm, adaxially white puberulous near base, base shortly clawed, apex obtuse, rarely emarginate. Stamens 18–20, slightly shorter than petals; anthers yellow. Ovary densely white pubescent apically; styles 2, free, not exceeding stamens. Fruit red, ovoid to ellipsoid, (5–)7–10 mm; pyrenes 1 or 2. Fl. May–Jun, fr. Sep–Oct.

• Dry slopes, forests, forest margins, river and mountain valleys; 1400–2600 m. Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan.

- 1a. Leaf blade broadly elliptic, suborbicular, or ovate, 1.5–5 cm; fruit 7–10 mm 11a. var. *soongoricus*
- 1b. Leaf blade oblong to narrowly elliptic, rarely obovate, 1–1.5 cm; fruit 5–6 mm 11b. var. *microcarpus*

11a. *Cotoneaster soongoricus* var. *soongoricus*

准噶尔栒子(原变种) zhun ga er xun zi (yuan bian zhong)

Cotoneaster nummularia Fischer & C. A. Meyer var. *soongoricus* Regel & Herder, Bull. Soc. Imp. Naturalistes Moscou 39(2): 59. 1866; *C. fontanesii* Spach var. *soongoricus* Regel; *C. nummularia* var. *ovalifolius* Boissier; *C. racemiflorus* (Desfontaines) K. Koch var. *ovalifolius* (Boissier) Hurusawa; *C. racemiflorus* var. *soongoricus* (Regel & Herder) C. K. Schneider; *C. suavis* Pojarkova; *C. tibeticus* G. Klotz; *C. tomentellus* Pojarkova; *C. zayulensis* G. Klotz.

Leaf blade broadly elliptic, suborbicular, or ovate, 1.5–5 cm. Fruit 7–10 mm.

• Dry slopes, forests, forest margins, river valleys; 1400–2400 m. Gansu, Nei Mongol, Ningxia, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan.

Further study is necessary to determine the identity of *Cotoneaster albokermesinus* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

11b. *Cotoneaster soongoricus* var. *microcarpus* (Rehder & E. H. Wilson) G. Klotz, Wiss. Z. Martin-Luther-Univ. Halle-Wittenberg, Math.-Naturwiss. Reihe 6: 973. 1957.

小果准噶尔栒子 xiao guo zhun ga er xun zi

Cotoneaster racemiflorus (Desfontaines) K. Koch var. *microcarpus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 169. 1912; *C. microcarpus* (Rehder & E. H. Wilson) Flinck & Hylmö; *C. potaninii* Pojarkova.

Leaf blade oblong to narrowly elliptic, rarely obovate, 1–1.5 cm. Fruit 5–6 mm.

• Mountain valleys; 2300–2600 m. Gansu, Hebei, Sichuan.

12. *Cotoneaster silvestrii* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 288. 1910.

华中栒子 hua zhong xun zi

Cotoneaster hupehensis Rehder & E. H. Wilson; *C. kangtinsensis* G. Klotz; *C. racemiflorus* (Desfontaines) K. Koch var.

veitchii Rehder & E. H. Wilson; *C. veitchii* (Rehder & E. H. Wilson) G. Klotz.

Shrubs deciduous, 1–2 m tall. Branchlets reddish brown to grayish brown, slender, initially reddish brown pubescent, soon glabrescent. Petiole 3–5 mm, thin, tomentose; stipules caducous, linear, 3–5 mm, puberulous; leaf blade elliptic to ovate, 1.5–3.5 × 1–1.8 cm, herbaceous, lateral veins 4 or 5 pairs, raised abaxially and slightly impressed adaxially, abaxially thinly gray tomentose, adaxially glabrous or slightly appressed pubescent, base rounded or broadly cuneate, apex acute or obtuse, sometimes mucronate, rarely emarginate. Corymbs 3–7-flowered; rachis and pedicels thinly pubescent; peduncles 1–2 cm. Pedicel 1–3 mm. Flowers 9–10 mm in diam. Hypanthium campanulate, abaxially thinly villous. Sepals triangular, 1.5–2.5 mm, apex acute. Petals spreading, white, suborbicular, 4–5 mm in diam., adaxially white pubescent near base, base shortly clawed, apex emarginate. Stamens 20, somewhat shorter than petals; anthers yellow. Ovary white pubescent apically; styles 2, free, not exceeding stamens. Fruit red, subglobose, 7–8 mm in diam.; pyrenes 2, united into 1. Fl. May–Jun, fr. Aug–Sep. $2n = 68^*$.

• Mixed forests; 500–2600 m. Anhui, Gansu, Henan, Hubei, Jiangsu, Jiangxi, Sichuan.

13. *Cotoneaster mongolicus* Pojarkova, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 17: 196. 1955.

蒙古栒子 meng gu xun zi

Cotoneaster tumeticus Pojarkova.

Shrubs deciduous, to 1.8 m tall. Branchlets spreading, dark reddish brown, terete, robust, initially white pubescent, glabrous when old. Petiole 2–3 mm, gray pubescent; stipules persistent, subulate, reddish brown, margin pubescent; leaf blade oblong-elliptic, (1.3–)2–3 × (0.5–)1–1.8 cm, veins raised abaxially, abaxially sparsely gray tomentose, adaxially lucid, glabrous or slightly pubescent, base cuneate, apex usually obtuse. Corymbs 3–6(or 7)-flowered; rachis and pedicels white pubescent; bracts subulate. Pedicel 2–3(–4) mm. Flowers 9–10 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals dark red, triangular, glabrous or sparsely pubescent only apically, apex subacute. Petals spreading, white, suborbicular, 3.5–4 mm, glabrous, margin irregularly emarginate, base not or shortly clawed. Stamens 20. Ovary densely pubescent apically; styles 2, free, not exceeding stamens. Fruit dark red or purplish red, obovoid, 8–9 mm, with slightly glaucous bloom, glabrous; pyrenes 2(or 3). Fr. Sep.

Dry stony places, thickets. Nei Mongol [E Mongolia].

14. *Cotoneaster hebeophyllus* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 273. 1912.

钝叶栒子 dun ye xun zi

Shrubs, sometimes treelike, deciduous, 1.5–3 m tall. Branchlets dark reddish brown, slender, initially pilose, soon glabrescent. Petiole 5–7 mm, sparsely tomentose-villous; stipules caducous at fruiting, linear-lanceolate, 3–4 mm, sparsely

villous; leaf blade elliptic to broadly ovate, (1.5–)2–3 × (1–)1.2–2 cm, subleathery, abaxially sparsely tomentose-villous or tomentose, with glaucous bloom, adaxially glabrous, base broadly cuneate to rounded, apex obtuse or emarginate, mucronate. Corymbs (1–)1.5–3 cm, 5–15-flowered; rachis and pedicels sparsely villous; bracts linear-lanceolate, 2–3 mm, slightly villous. Pedicel 2–3 mm. Hypanthium campanulate, abaxially glabrous or slightly pilose near base. Sepals broadly triangular, abaxially glabrous or puberulous only apically, apex acute. Petals spreading, white, suborbicular, 5–6 mm in diam., adaxially puberulous near base, base very shortly clawed, apex obtuse. Stamens 20, slightly shorter than petals; anthers purple. Ovary densely pilose apically; styles 2, free, somewhat not exceeding stamens. Fruit dark red, ovoid or pyriform, rarely oblong, (5–)6–8 mm in diam.; pyrenes 2, sometimes united into 1. Fl. May–Jun, fr. Aug–Sep.

• Mountain regions, clearings at forest margins, thickets, river valleys; 1300–3400 m. Gansu, Hebei, Sichuan, SE Xizang, Yunnan.

- 1a. Fruit 7–8 mm in diam.; leaf blade abaxially sparsely tomentose-villous.
- 2a. Fruit usually ovoid, sometimes oblong, with 2 pyrenes usually united into 1 14a. var. *hebephyllus*
- 2b. Fruit broadly pyriform, with 2 pyrenes not united 14b. var. *majusculus*
- 1b. Fruit 5–7 mm in diam.; leaf blade abaxially tomentose.
- 3a. Fruit pyriform; leaf blade abaxially densely gray or yellowish gray tomentose 14c. var. *incanus*
- 3b. Fruit usually ovoid; leaf blade abaxially densely yellow tomentose 14d. var. *fulvidus*

14a. Cotoneaster hebephyllus var. **hebephyllus**

钝叶栒子(原变种) *dun ye xun zi* (yuan bian zhong)

Cotoneaster giraldii Flinck & Hylmö ex G. Klotz; *C. hebephyllus* var. *monopyrenus* W. W. Smith; *C. monopyrenus* (W. W. Smith) Flinck & Hylmö.

Leaf blade abaxially sparsely tomentose-villous. Fruit ovoid, sometimes oblong, 7–8 mm in diam.; pyrenes 2 usually united into 1.

• Rocky mountain regions, clearings at forest margins, thickets; 1300–3400 m. Gansu, Hebei, Sichuan, SE Xizang, Yunnan.

14b. Cotoneaster hebephyllus var. **majusculus** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 22. 1917.

大果钝叶栒子 *da guo dun ye xun zi*

?*Cotoneaster handel-mazzettii* G. Klotz; *C. majusculus* (W. W. Smith) G. Klotz.

Leaf blade abaxially sparsely tomentose-villous. Fruit broadly pyriform, 7–8 mm in diam.; pyrenes 2.

• Thickets on slopes; 3000–3400 m. NW Yunnan.

14c. Cotoneaster hebephyllus var. **incanus** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 22. 1917.

灰毛钝叶栒子 *hui mao dun ye xun zi*

Cotoneaster incanus (W. W. Smith) G. Klotz.

Leaf blade abaxially densely gray or yellowish gray tomentose. Fruit pyriform, 5–7 mm in diam.; pyrenes 2.

• Mountain regions; 2000–3300 m. NW Yunnan.

14d. Cotoneaster hebephyllus var. **fulvidus** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 22. 1917.

黄毛钝叶栒子 *huang mao dun ye xun zi*

Cotoneaster fulvidus (W. W. Smith) G. Klotz.

Leaf blade abaxially densely yellow tomentose. Fruit usually ovoid, 5–7 mm in diam.; pyrenes 2.

• Open thickets, river valleys; 2000–2300 m. W Yunnan.

15. Cotoneaster submultiflorus Popov, Bull. Soc. Imp. Naturalistes Moscou, n.s., 44: 126. 1935.

毛叶水栒子 *mao ye shui xun zi*

Cotoneaster borealichinensis (Hurusawa) Hurusawa; *C. multiflorus* Bunge var. *borealichinensis* Hurusawa.

Shrubs deciduous, erect, 2–4 m tall. Branchlets brownish or grayish brown, terete, slender, initially densely pubescent, gradually glabrescent. Petiole 4–7 mm, puberulous; stipules lanceolate, pubescent, usually glabrescent; leaf blade ovate or rhombic-ovate to elliptic, 2–4 × 1.2–2 cm, abaxially pubescent, without glaucous bloom, adaxially glabrous or initially puberulous, base broadly cuneate, apex acute or obtuse. Corymbs 1.5–2.5 cm, many flowered; rachis and pedicels villous; bracts linear, villous. Pedicel 4–6 mm. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially pilose. Sepals triangular, shorter than petals, apex acute. Petals spreading, white, ovate or suborbicular, 3–5 × 2.5–4 mm, base shortly clawed, apex obtuse or somewhat emarginate. Stamens 15–20, shorter than petals. Ovary pubescent apically; styles 2, free, not exceeding stamens. Fruit bright red, subglobose, 6–7 mm in diam.; pyrenes usually 2, united into 1. Fl. May–Jun, fr. Aug–Sep.

Rock crevices, thickets; 900–2000 m. Gansu, Hebei, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [C Asia].

16. Cotoneaster multiflorus Bunge in Ledebour, Fl. Altaic. 2: 220. 1830.

水栒子 *shui xun zi*

Shrubs deciduous, erect, (0.5–)4 m tall. Branchlets arching, reddish brown or brownish, terete, slender, initially pubescent, soon glabrescent. Petiole 3–8(–10) mm, initially pilose, glabrate; stipules linear, 2.5–5 mm, initially sparsely pilose, glabrate; leaf blade ovate to broadly ovate, (1.5–)2–4(–5) × (1.2–)1.5–3(–4) cm, midvein raised abaxially and impressed adaxially, abaxially pilose, glabrescent, adaxially glabrous, base broadly cuneate or rounded, apex acute or obtuse. Corymbs lax, 5–21-flowered; rachis and pedicels glabrous, rarely slightly

puberulous; bracts linear, 2–4 mm, glabrous or slightly puberulous. Pedicel 4–6 mm. Flowers 1–1.2 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2 × 2–2.5 mm, apex acute. Petals spreading, white, suborbicular, 4–5 mm in diam., adaxially white puberulous near base, base shortly clawed, apex obtuse or emarginate. Stamens ca. 20, slightly shorter than petals. Ovary pilose apically; styles usually 2, free, not exceeding stamens. Fruit red or purplish red, subglobose or obovoid, (5–)7–8(–12) mm in diam.; pyrenes 2, united into 1. Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

River valleys, dense and mixed forests on slopes, forest margins, thickets, stream sides; 1200–3500 m. Gansu, Hebei, Heilongjiang, Henan, Hubei, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Russia; C and SW Asia].

- 1a. Fruit purplish red, 5–6 mm in diam. 16c. var. *atropurpureus*
- 1b. Fruit red, 7–12 mm in diam.
 - 2a. Fruit 7–8 mm in diam. 16a. var. *multiflorus*
 - 2b. Fruit 10–12 mm in diam. 16b. var. *calocarpus*

16a. *Cotoneaster multiflorus* var. *multiflorus*

水栒子(原变种) shui xun zi (yuan bian zhong)

Cotoneaster magnificus J. Fryer & B. Hylmö; *C. reflexus* Carrière.

Fruit red, 7–8 mm in diam. $2n = 68$.

River valleys, mixed forests on slopes; 1200–3500 m. Gansu, Hebei, Heilongjiang, Henan, Hubei, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Russia; C and SW Asia].

16b. *Cotoneaster multiflorus* var. *calocarpus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 170. 1912.

大果水栒子 da guo shui xun zi

Cotoneaster calocarpus (Rehder & E. H. Wilson) Flinck & Hylmö; *C. przewalskii* Pojarkova.

Fruit red, 1–1.2 cm in diam. $2n = 68^*$.

• Dense forests on slopes; 1600–2600 m. Gansu, Shaanxi, Sichuan.

16c. *Cotoneaster multiflorus* var. *atropurpureus* T. T. Yu, Acta Phytotax. Sin. 8: 219. 1963.

紫果水栒子 zi guo shui xun zi

Fruit purplish black, 5–6 mm in diam.

• Forest margins, thickets, stream sides; 2500–3100 m. W Sichuan, Xizang, NW Yunnan.

17. *Cotoneaster zabelii* C. K. Schneider, Ill. Handb. Laubholz. 1: 749. 1906.

西北栒子 xi bei xun zi

Cotoneaster zabelii var. *miniatus* Rehder & E. H. Wilson.

Shrubs deciduous, to 2 m tall. Branchlets dark reddish brown, terete, initially densely yellow pubescent, glabrous when old. Petiole 2–4 mm, tomentose; stipules lanceolate, 2–4

mm, pubescent, usually glabrescent at fruiting; leaf blade elliptic to ovate, 1.5–3 × 1–2 cm, abaxially densely yellow or gray tomentose, adaxially sparsely pubescent, base rounded or broadly cuneate, apex obtuse, rarely emarginate. Corymbs pendent, 1.5–3 cm, 3–10-flowered or more; rachis and pedicels tomentose. Pedicel 2–4 mm. Hypanthium campanulate, abaxially tomentose. Sepals triangular, 1–2 × 1.5–2.5 mm, apex slightly obtuse or shortly pointed. Petals erect, pinkish, obovate or suborbicular, 2–3 mm in diam., apex obtuse. Stamens 18–20, shorter than petals. Ovary pilose apically; styles 2, free, not exceeding stamens. Fruit bright red, obovoid to ovoid-globose, 7–8 mm in diam.; pyrenes often 2. Fl. May–Jun, fr. Aug–Sep.

• Calcareous mountain regions, shaded slopes, river valleys, thickets; 800–2500 m. Gansu, Hebei, Henan, Hubei, Hunan, Jiangxi, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi.

Further study is necessary to determine the identity of *Cotoneaster shansiensis* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

18. *Cotoneaster fangianus* T. T. Yu, Acta Phytotax. Sin. 8: 219. 1963.

恩施栒子 en shi xun zi

Shrubs deciduous. Branchlets reddish brown to grayish brown, terete, thin, initially densely yellow strigose, gradually glabrescent, subglabrous when old. Petiole short and robust, 2–3 mm, yellow pubescent; stipules partly persistent, linear-lanceolate; leaf blade broadly ovate to suborbicular, 1–2 × 1–1.5 cm, midvein somewhat raised abaxially and slightly impressed adaxially, lateral veins 3–5 pairs, abaxially densely yellow tomentose, adaxially glabrous, base rounded, apex often obtuse, rarely acute. Corymbs 1.5–2.5 × 2–2.5 cm, 10–15-flowered; rachis and pedicels pubescent; bracts linear or linear-lanceolate. Pedicel 1–2 mm. Flowers 4–5 mm in diam. Hypanthium campanulate, abaxially puberulous or subglabrous. Sepals triangular, apex obtuse, sometimes acute. Petals erect, pink, suborbicular or broadly obovate, 1–2 mm in diam., base shortly clawed, apex emarginate or obtuse. Stamens 20, slightly shorter than petals. Ovary pubescent apically; styles 3, free, nearly equaling or somewhat lower than stamens. Fruit oblong; pyrenes 3. Fl. May–Jun.

• River banks; 1300–1400 m. SW Hubei.

19. *Cotoneaster tenuipes* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 171. 1912.

细枝栒子 xi zhi xun zi

Shrubs deciduous, 1–2 m tall. Branchlets brownish red, terete, slender, initially grayish yellow appressed villous, soon glabrescent, glabrous when old. Petiole 3–5 mm, villous; stipules caducous or partly persistent, lanceolate, 2.5–5 mm, slightly villous; leaf blade ovate or elliptic-ovate to narrowly elliptic-ovate, 2–2.5(–3.5) × 1.2–2 cm, veins somewhat raised abaxially and slightly impressed adaxially, abaxially gray appressed tomentose, adaxially initially sparsely pilose, subglabrous when old, base broadly cuneate, apex acute or ± obtuse. Corymbs 1.5–2.5 cm, 2–4-flowered; rachis and pedicels densely appressed villous; bracts linear or linear-lanceolate, 2–4 mm, puberulous

lous. Pedicel 1–3 mm, slender. Flowers ca. 7 mm in diam. Hypanthium densely appressed villous abaxially. Sepals ovate-triangular, ca. 1.2 mm, apex acute. Petals erect, white, ovate or suborbicular, 3–4 mm and nearly as broad, base clawed, apex obtuse. Stamens 15, shorter than petals. Ovary puberulous apically; styles 2, free, not exceeding stamens. Fruit purplish black, ovoid, 8–9 × 5–6 mm; pyrenes 1 or 2. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Forests, rocky mountain areas; 1900–3100 m. Gansu, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

20. *Cotoneaster wardii* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 25. 1917.

白毛栒子 *bai mao xun zi*

Shrubs evergreen, to 3 m tall. Branchlets terete, initially white tomentose, glabrescent. Petiole robust, 2–4 mm, densely tomentose; stipules linear, 4–6 mm, sparsely pubescent; leaf blade dark green adaxially, ovate or elliptic, 2.5–4 × 1.5–2 cm, midvein distinctly raised abaxially and impressed adaxially, lateral veins 5 or 6 pairs, abaxially densely silvery tomentose, adaxially initially sparsely pilose, glabrous when old, base rounded or broadly cuneate, apex acute. Corymbs 9–15-flowered; rachis and pedicels densely white tomentose; bracts reddish brown, linear, 4–5 mm, sparsely pubescent. Pedicel 1–3 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially densely white tomentose. Sepals triangular, apex acute. Petals erect, white, tinged reddish, suborbicular or broadly obovate, 3–4 × 2.5–3.5 mm, base shortly clawed, margin slightly incised, apex obtuse. Stamens 20, somewhat shorter than petals. Ovary white pubescent apically; styles 2(–4), free, not exceeding stamens. Fruit orangish red, obovoid, 8–9 mm in diam.; pyrenes usually 2. Fl. May–Jun, fr. Sep–Oct.

• Forest margins; 3000–4000 m. SE Xizang.

21. *Cotoneaster dielsianus* E. Pritzl, Bot. Jahrb. Syst. 29: 385. 1900.

木帚栒子 *mu zhou xun zi*

Shrubs deciduous, 1–2 m tall. Branchlets grayish black or brownish black, terete, thin, initially densely villous, glabrescent. Petiole 1–3 mm, tomentose; stipules partly persistent at fruiting, linear-lanceolate, nearly as long as or slightly longer than petioles, initially tomentose, glabrous when mature; leaf blade elliptic to ovate, (0.6–)1–2.5 × 0.8–1.5 cm, abaxially densely yellowish gray or gray tomentose, adaxially puberulous or subglabrous and shiny, base broadly cuneate or rounded, apex acute, rarely obtuse or emarginate. Corymbs 1.5–3 cm, 3–7-flowered; rachis and pedicels villous; bracts linear-lanceolate, 2–3 mm, pubescent. Pedicel 1–3 mm. Flowers 6–7 mm in diam. Hypanthium villous abaxially. Sepals triangular, 1–2 × 1.5–2.5 mm, apex acute, rarely obtuse or emarginate. Petals erect, pinkish, suborbicular or broadly obovate, 3–4 mm in diam., base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pilose apically; styles 3(–5), free, very short. Fruit dark red or coral-red, subglobose or obovoid, 5–8 mm in diam.; pyrenes 3–5. Fl. Jun–Jul, fr. Sep–Oct.

• Waste slopes, river valleys, grassy places, thickets, dense forests; 1000–3600 m. Gansu, Guizhou, Hubei, Sichuan, Xizang, Yunnan.

1a. Leaf blade 1–2.5 cm, adaxially puberulous; fruit red 21a. var. *dielsianus*

1b. Leaf blade 0.6–1.5 cm, adaxially shiny, subglabrous; fruit coral-red 21b. var. *elegans*

21a. *Cotoneaster dielsianus* var. *dielsianus*

木帚栒子(原变种) *mu zhou xun zi* (*yuan bian zhong*)

Cotoneaster applanatus Duthie ex Veitch; *C. sikangensis* Flinck & Hylmö; *C. vilmorinianus* G. Klotz.

Leaf blade 1–2.5 cm, adaxially puberulous. Fruit red.

• Waste slopes, river valleys, grassy places, thickets; 1000–3600 m. Gansu, Guizhou, Hubei, Sichuan, Xizang, Yunnan.

Further study is necessary to determine the identities of *Cotoneaster bradyi* J. Fryer & E. C. Nelson and *C. tardiflorus* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

21b. *Cotoneaster dielsianus* var. *elegans* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 166. 1912.

小叶木帚栒子 *xiao ye mu zhou xun zi*

Cotoneaster dokeriensis G. Klotz; *C. elegans* (Rehder & E. H. Wilson) Flinck & Hylmö; *C. splendens* Flinck & Hylmö.

Leaf blade 0.6–1.5 cm, adaxially shiny, subglabrous. Fruit coral-red. $2n = 68^*$.

• Dense forests; 2000–3000 m. Guizhou, Sichuan.

22. *Cotoneaster glomerulatus* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 21. 1917.

球花栒子 *qiu hua xun zi*

Shrubs deciduous, to 3 m tall. Branchlets grayish brown or blackish brown, terete, initially densely yellow tomentose-villous, gradually glabrescent. Petiole 2–3 mm, yellow tomentose; stipules brown, lanceolate, nearly as long as petioles, sparsely villous; leaf blade ovate-lanceolate to oblong-ovate, 4–5 × 2–2.5 cm, lateral veins 4 or 5 pairs, slightly impressed adaxially, abaxially sparsely yellow tomentose, adaxially glabrous or puberulous, base broadly cuneate to rounded, apex acute, rarely acuminate or ± obtuse. Corymbs 1.5–2.5 cm, 3–11-flowered; rachis and pedicels densely yellow tomentose-villous; bracts linear or linear-lanceolate, 1–3 mm, slightly yellow villous. Pedicel very short, 1–2 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially yellow villous. Sepals triangular, 1–1.5 × 1.5–2.5 mm, apex acute. Petals erect, white, stained reddish, suborbicular, 3–3.5 mm and ca. as broad, base clawed, apex obtuse. Stamens ca. 20. Ovary yellowish pilose apically; styles 5, free, not exceeding stamens. Fruit bright red, subglobose, ca. 5 mm in diam.; pyrenes 5. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Slopes, river valleys, sparse forests, open scrub; 2000–2600 m. W Yunnan.

Further study is necessary to determine the identity of *Cotoneaster tengyuehensis* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

23. *Cotoneaster obscurus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 161. 1912.

暗红栒子 an hong xun zi

Shrubs deciduous, (0.5–)1.5–3 m tall, much branched. Branchlets brown or purplish brown to blackish brown, terete, initially yellowish strigose, gradually glabrescent. Petiole 2–4 mm, sparsely pilose; stipules lanceolate, 2–4 mm, membranous, pilose; leaf blade elliptic-ovate or rhombic-ovate, 2.5–4.5 × 1.5–2.5 cm, lateral veins 5–7 pairs, raised abaxially and slightly impressed adaxially, abaxially yellowish gray tomentose, adaxially sparsely pubescent, base broadly cuneate, apex acuminate, rarely acute. Corymbs 1.5–2.5 cm, 3–7-flowered; rachis and pedicels pubescent; bracts linear-lanceolate, 2–3 mm, membranous, slightly pubescent. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular, 1.5–2 mm and ca. as broad, apex shortly acuminate. Petals erect, reddish, elliptic to ovate, 3–4 × 2–3 mm, base shortly clawed, apex obtuse. Stamens 16–20, shorter than petals. Ovary white pubescent apically; styles 2 or 3, free, somewhat not exceeding stamens. Fruit dark red, ovoid, 7–8 × 5–6 mm; pyrenes usually 2–4. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Mountain valleys, thickets along river banks; 1500–3000 m. Guizhou, Hubei, Sichuan, Xizang, Yunnan.

24. *Cotoneaster franchetii* Bois, Rev. Hort. 1902: 379. 1902.

西南栒子 xi nan xun zi

Cotoneaster amoenus E. H. Wilson; *C. franchetii* var. *cinerascens* Rehder; *C. insculptus* Diels; *C. mairei* H. Léveillé; *C. mairei* var. *albiflorus* H. Léveillé.

Shrubs semievergreen, 1–3 m tall, with spreading, arching-inflexed branches. Branchlets dark grayish brown or grayish black, initially densely strigose, gradually glabrescent. Petiole 2–4 mm, tomentose; stipules linear-lanceolate, 2–4 mm, initially tomentose, glabrate; leaf blade elliptic to ovate, 2–3 × 1–1.5 cm, thick, lateral veins 4 or 5 pairs, raised abaxially and deeply impressed adaxially, abaxially densely yellow or white tomentose, adaxially initially appressed pubescent, glabrescent, base cuneate, apex acute or acuminate. Corymbs 1.5–2.5 cm, 5–11-flowered; rachis and pedicels densely tomentose; bracts linear, 2–3.5 mm, tomentose. Pedicel 2–4 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially densely pubescent. Sepals triangular, 1–2 × 1.5–2.5 mm, apex acute or shortly acuminate. Petals erect, pink, broadly obovate or elliptic, 3–4 × 2–3 mm, adaxially puberulous near base, base shortly clawed, apex obtuse. Stamens 20, shorter than petals. Ovary pubescent apically; styles 2 or 3(–5), free, not exceeding stamens. Fruit orangish red or red, ovoid-globose, 6–7 mm in diam., initially pubescent, finally glabrous; pyrenes usually 3, rarely to 5. Fl. Jun–Jul, fr. Sep–Oct. $2n = 68^*$.

Thickets in rocky sunny mountain regions, open hillsides; 1600–2900 m. Guizhou, Sichuan, Xizang, Yunnan [Thailand].

Further study is necessary to determine the identity of *Cotoneaster induratus* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

25. *Cotoneaster reticulatus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 160. 1912.

网脉栒子 wang mai xun zi

Shrubs deciduous, to 4 m tall. Branchlets brown to dark reddish brown, terete, initially yellow strigose, glabrescent. Petiole (2–)3–4 mm, pilose, glabrate; stipules lanceolate, 2–3 mm, pilose; leaf blade bright green adaxially, elliptic-ovate, rarely rhombic-ovate, (1–)2.5–3.5 × (0.8–)1–1.6 cm, subleathery, lateral veins 4 or 5 pairs, distinctly raised abaxially and impressed adaxially, abaxially yellowish gray tomentose, adaxially glabrous, rugose, base broadly cuneate to rounded, apex acuminate to acute. Corymbs 1.5–2.5 cm, 3–6-flowered; rachis and pedicels glabrous; bracts linear or linear-lanceolate. Pedicel 5–6 mm. Petals pink. Fruit purplish black, subglobose, 5–7 mm in diam., glabrous; pyrenes (2–)5. Fl. May–Jun, fr. Sep–Oct.

• Waste places, forest margins; 2600–3000 m. W Sichuan.

26. *Cotoneaster oliganthus* Pojarkova, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 8: 141. 1938.

少花栒子 shao hua xun zi

Shrubs deciduous, 1–2 m tall. Branchlets dark brown, initially densely greenish gray appressed tomentose, glabrescent, subglabrous when old. Petiole 2–4 mm, tomentose; leaf blade bright green adaxially, elliptic or ovate-orbicular, (0.8–)1–2.5(–2.7) × (0.4–)0.7–2 cm, abaxially greenish gray tomentose, adaxially sparsely appressed pubescent or glabrous, base broadly cuneate to rounded, apex usually obtuse, rarely ± acute, sometimes emarginate, often mucronate. Fascicles or racemes ca. 1/2 as long as leaves, on very short lateral branchlets in leaf axils, 2–4-flowered; rachis 2–4 mm, tomentose. Pedicel 2–5 mm, tomentose. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially sparsely appressed pubescent or subglabrous. Sepals broadly ovate, margin purple and tomentose-ciliate, apex obtuse or ± acute. Petals erect or somewhat divaricate, pink, base floccose. Stamens 20. Styles 2(or 3), free. Fruit red, subglobose to ellipsoid, 5–8 mm in diam.; pyrenes often 2(or 3). Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

Mountain regions. Nei Mongol, Xinjiang [Kazakhstan, Kyrgyzstan].

27. *Cotoneaster integerrimus* Medikus, Gesch. Bot. 85. 1793.

全缘栒子 quan yuan xun zi

Cotoneaster vulgaris Lindley; *Mespilus cotoneaster* Linnaeus; *Ostinia cotoneaster* (Linnaeus) Clairville.

Shrubs deciduous, erect, to 2 m tall, much branched, with broad spreading crown. Branchlets brown or grayish brown, terete, initially densely gray tomentose, soon glabrescent. Petiole 2–5 mm, tomentose; stipules mostly persistent at fruiting, lanceolate, puberulous; leaf blade broadly elliptic, broadly ovate, or suborbicular, 2–5 × (0.5–)1.3–2.5(–3) cm, veins raised abaxially and impressed adaxially, abaxially densely gray tomentose, adaxially glabrous or sparsely pubescent, base rounded, apex acute or obtuse, usually mucronate. Corymbs 1.5–2.5 cm, 2–5(–7)-flowered; rachis and pedicels glabrous or puberulous; bracts lanceolate, puberulous. Pedicel 3–6 mm. Flowers ca. 8 mm in diam. Hypanthium campanulate, glabrous or puberulous abaxially. Sepals triangular-ovate, 1–1.5 × 1–2 mm, apex obtuse. Petals erect, pink, suborbicular, ca. 3 mm in diam.,

base clawed, apex obtuse. Stamens 15–20, nearly as long as petals. Ovary pilose apically; styles 2, rarely 3, free, not exceeding stamens. Fruit red or dark red, subglobose, rarely ovoid, 6–7(–8) mm in diam., glabrous; pyrenes usually 2, rarely 3 or 4. Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

Rocky slopes, forests; below 2500 m. Hebei, Heilongjiang, Nei Mongol, Qinghai, Xinjiang [Korea, Russia; N Asia, Europe].

28. *Cotoneaster gracilis* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 167. 1912.

细弱栒子 *xi ruo xun zi*

Shrubs deciduous, 1–3 m tall. First year's branches glabrous; branchlets brownish red to grayish brown, terete, slender, initially densely tomentose-villous, gradually glabrescent. Petiole 2–3 mm, white tomentose; stipules caducous, subulate, 2–4 mm, membranous, pubescent; leaf blade ovate to oblong-ovate, 2–3.5 × 1–2 cm, lateral veins 3 or 4 pairs, conspicuously raised abaxially and impressed adaxially, abaxially densely white tomentose, adaxially glabrous or puberulous, base rounded, apex obtuse or acute, rarely emarginate. Corymbs (1–)1.5–2.5 cm, 3–7-flowered; rachis and pedicels pilose; bracts linear, 2–3 mm, pilose. Pedicel 3–6 mm. Flowers 6–7 mm in diam. Hypanthium red, campanulate, abaxially glabrous. Sepals triangular-ovate, 1–2 mm, apex obtuse or ± acute. Petals erect, pink, suborbicular, 2.5–3.5 mm in diam., glabrous, shortly clawed. Stamens 20, slightly shorter than petals. Ovary pubescent apically; styles usually 2, free, not exceeding stamens. Fruit red, obovoid, 5–6 mm in diam., puberulous; pyrenes usually 2. Fl. May–Jun, fr. Aug–Sep.

• Mountain regions, slopes, river banks, thickets; 1000–3000 m. Gansu, Henan, Hubei, Shaanxi, Sichuan.

- 1a. Leaf blade ovate to oblong-ovate, 20–35 × 10–20 mm, densely tomentose abaxially; inflorescences 3–7-flowered 28a. var. *gracilis*
- 1b. Leaf blade ovate-elliptic to broadly elliptic, 7–14 × 5.5–8 mm, tenuously tomentose abaxially; inflorescences 1–3(–6)-flowered 28b. var. *difficilis*

28a. *Cotoneaster gracilis* var. *gracilis*

细弱栒子(原变种) *xi ruo xun zi* (*yuan bian zhong*)

Leaf blade ovate to oblong-ovate, 2–3.5 × 1–2 cm, abaxially densely tomentose. Inflorescences 3–7-flowered.

• Slopes, river banks, thickets; 1000–3000 m. Gansu, Hubei, Shaanxi, Sichuan.

28b. *Cotoneaster gracilis* var. *difficilis* (G. Klotz) L. T. Lu, Novon 12: 496. 2002.

小叶细弱栒子 *xiao ye xi ruo xun zi*

Cotoneaster difficilis G. Klotz, Wiss. Z. Friedrich-Schiller- Univ. Jena, Math.-Naturwiss. Reihe (Beitr. Phytotax. 3) 21: 1017. 1972.

Leaf blade ovate-elliptic to broadly elliptic, 7–14 × 5.5–8 mm, abaxially tenuously tomentose. Inflorescences 1–3(–6)-

flowered.

• Mountain regions; 1800–3000 m. SE Gansu, W Sichuan.

29. *Cotoneaster melanocarpus* Loddiges, Bot. Cab. 16: t. 1531. 1828.

黑果栒子 *hei guo xun zi*

Cotoneaster niger (Wahlberg) Fries; *C. orientalis* A. Kerner; *C. peduncularis* Boissier; *C. vulgaris* Lindley var. *melanocarpus* (Loddiges) Ledebour; *Mespilus cotoneaster* var. *nigra* Wahlberg.

Shrubs deciduous, 1–2(–2.5) m tall. Branchlets brown or purplish brown, terete, initially tomentose, soon glabrate, glabrous when old. Petiole (1–)2–5 mm, tomentose; stipules partly persistent, lanceolate, pubescent; leaf blade ovate-elliptic to broadly ovate, 2–4.5(–6) × 1–3 cm, abaxially white tomentose, adaxially initially slightly pubescent, glabrous when mature, base rounded or broadly cuneate, apex obtuse or ± acute, mucronate, sometimes emarginate. Corymbs nodding, 2–4 cm, 3–15-flowered; rachis and pedicels pubescent; bracts linear, pubescent. Pedicel 3–7(–9) mm. Flowers ca. 7 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 mm, apex obtuse. Petals erect, pinkish, reddish, or reddish white, suborbicular, 3–4 mm in diam. Stamens 20, shorter than petals. Ovary pubescent apically; styles 3 or 2, free, shorter than petals. Fruit bluish black, with glaucous bloom, subglobose, 6–7(–9) mm in diam.; pyrenes 2 or 3. Fl. May–Jun, fr. Aug–Sep.

Slopes, sparse forests, thickets; 700–2600 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Shanxi, Xinjiang [Japan, N Mongolia, Russia; E Europe].

30. *Cotoneaster acuminatus* Lindley, Trans. Linn. Soc. London 13: 101. 1822.

尖叶栒子 *jian ye xun zi*

Cotoneaster bakeri G. Klotz; *C. kongboensis* G. Klotz; *C. mucronatus* Franchet; *C. nepalensis* André; *Mespilus acuminata* Loddiges.

Shrubs deciduous, erect, 2–3(–4) m tall. Branchlets grayish brown to brownish, terete, initially densely yellowish strigose, glabrous when old. Petiole 3–5 mm, villous; stipules partly caducous at fruiting, lanceolate, 3–5 mm, villous; leaf blade elliptic-ovate to ovate-lanceolate, 2–6.5 × 2–3 cm, both surfaces villous, more densely so abaxially, base broadly cuneate, apex acuminate, rarely acute. Cymes 1–2 cm, (1 or) 2 or 3(–5)-flowered; rachis and pedicels yellowish villous; bracts lanceolate or linear, 2–4 mm, margin villous. Pedicel 3–5 mm. Flowers 6–8 mm in diam. Hypanthium campanulate, abaxially appressed villous. Sepals triangular, 1.5–2.5 × 2–3 mm, apex acute. Petals erect, pink or whitish, ovate to obovate, 3–4 mm and nearly as broad, glabrous, base clawed, apex obtuse or erose. Stamens 20, shorter than petals. Ovary pilose apically; styles 2, free, not exceeding stamens. Fruit bright red, ellipsoid, 8–10 × 7–8 mm; pyrenes 2. Fl. May–Jun, fr. Sep–Oct. $2n = 34, 68$.

Mixed forests, thickets, fields; 1500–3000 m. Sichuan, Xizang, Yunnan [Bhutan, N India, Nepal, Sikkim].

31. *Cotoneaster nitidifolius* Marquand, Hooker's Icon. Pl. 32: t. 3145. 1930.

亮叶栒子 liang ye xun zi

Shrubs deciduous, erect, 2–3 m tall. Branchlets grayish brown to reddish brown, terete, slender, initially densely yellow pubescent, gradually glabrescent. Petiole 3–5 mm, pubescent; stipules reddish, lanceolate, 3–5 mm, initially sparsely pubescent, glabrescent; leaf blade elliptic-lanceolate, 4–6.5(–8) × 1.5–2.5(–3) cm, veins raised abaxially and impressed adaxially, abaxially pubescent, more densely so along veins, adaxially glabrous, base cuneate, apex acuminate. Corymbs 1.5–2.5 cm, 3–9-flowered; rachis and pedicels pubescent; bracts reddish, linear-lanceolate, 3–4 mm, puberulous. Pedicel 1–3 mm, pubescent. Flowers nodding, 5–6 mm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular, 1.5–2 × 1.5–2 mm, apex acute. Petals erect, red basally, white apically, suborbicular or elliptic, 3–4 mm, base clawed, apex obtuse and whitish. Stamens 16–18, shorter than petals. Ovary with pubescent apex; styles 2, free, not exceeding stamens. Fruit crimson, subglobose, 5–6 mm in diam., glabrous; pyrenes often 2. Fl. May–Jun, fr. Aug–Sep.

• Open thickets by streams, mixed forests; 2000–3000 m. Sichuan, Yunnan.

32. *Cotoneaster schantungensis* G. Klotz, Wiss. Z. Friedrich-Schiller-Univ. Jena, Math.-Naturwiss. Reihe 21: 1018. 1972.

山东栒子 shan dong xun zi

Shrubs deciduous, to 2 m tall. Branchlets reddish brown or grayish brown, terete, slender, initially densely gray villous, glabrous when old. Petiole 2–4.5 mm, slightly villous; stipules caducous or partly persistent, lanceolate, 1–2 mm, villous; leaf blade broadly elliptic or broadly ovate, sometimes obovate or suborbicular, 2–3.5 × 1.5–2.4 cm, papery, lateral veins 3–5 pairs, slightly raised abaxially, abaxially initially densely villous, glabrate, adaxially initially villous, glabrescent, base broadly cuneate to rounded, apex usually obtuse or emarginate, rarely mucronate. Corymbs suberect or spreading, 3–6-flowered; rachis and pedicels initially villous, finally subglabrous. Hypanthium campanulate, abaxially sparsely pilose. Sepals broadly triangular. Petals not seen. Fruit dark red, obovoid, 6–8 mm, sparsely pilose or subglabrous; pyrenes 2. Fl. May–Jun, fr. Aug–Sep.

• Stony slopes; 900–1900 m. Shandong.

33. *Cotoneaster bullatus* Bois in Vilmorin & Bois, Frutic. Vilm. 119. 1904.

泡叶栒子 pao ye xun zi

Shrubs deciduous, spreading, to 2 m tall. Branchlets slightly inflexed, grayish black, terete, stout, initially strigose, gradually glabrescent. Petiole (1.5–)3–6 mm, pilose; stipules caducous, brown, lanceolate, 3–5 mm, pilose; leaf blade oblong-ovate to elliptic or lanceolate-oblong, 3.5–7(–15) × 2–4(–8) cm, veins prominently raised abaxially, abaxially pilose, more densely so along veins, sometimes subglabrous, adaxially glabrous or pilose, conspicuously rugose and bullate, base cuneate or rounded, apex acuminate, rarely acute. Corymbs 2.5–5 cm in

diam., (3–)5–13(–31)-flowered; rachis and pedicels pilose; bracts lanceolate, 2–3 mm, pilose. Pedicel 1–3 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially initially pilose, glabrate. Sepals triangular, 1–1.5 × 1.5–2.5 mm, apex acute. Petals erect, pinkish, obovate, 4–4.5 mm and nearly as broad, base shortly clawed, apex obtuse. Stamens 20–22, shorter than petals. Ovary pubescent apically; styles 4 or 5, free, very short. Fruit red, globose or obovoid, 6–8 × 6–8 mm; pyrenes 4 or 5. Fl. May–Jun, fr. Aug–Sep.

• Slopes, sparse forests, thickets, river banks, mountain forests and valleys; 900–3200 m. Hubei, Sichuan, Xizang, Yunnan.

- 1a. Petiole 3–6 mm; corymbs (3–)5–13-flowered.
 - 2a. Corymbs 5–13-flowered 33a. var. *bullatus*
 - 2b. Corymbs 3–5-flowered 33b. var. *camilli-schneideri*
- 1b. Petiole 1.5–2.5 mm; corymbs 9–31-flowered.
 - 3a. Leaf blade 5–15 × 2.5–8 cm, petiole ca. 2 mm; corymbs 11–31-flowered, 5–8 cm in diam. 33c. var. *macrophyllus*
 - 3b. Leaf blade usually less than 5 cm, petiole usually less than 2 mm; corymbs (9–)15–31-flowered, 4–6 cm in diam. 33d. var. *floribundus*

33a. *Cotoneaster bullatus* var. *bullatus*

泡叶栒子(原变种) pao ye xun zi (yuan bian zhong)

Petiole 3–6 mm; leaf blade oblong-ovate or elliptic-ovate, 3.5–7 × 2–4 cm. Inflorescences 3–5 cm in diam., 5–13-flowered.

• Slopes, sparse forests, river banks, mountain valleys; 2000–3200 m. Hubei, Sichuan, Xizang, Yunnan.

33b. *Cotoneaster bullatus* var. *camilli-schneideri* (Pojarkova) L. T. Lu, **comb. et stat. nov.**

少花泡叶栒子 shao hua pao ye xun zi

Basionym: *Cotoneaster camilli-schneideri* Pojarkova, Bot. Mater. Gerb. Bot. Inst. Komarova Acad. Nauk SSSR 17: 180. 1955.

Petiole 3–6 mm; leaf blade ovate-elliptic or elliptic, rarely obovate, 3–6.5 × 2–4 cm. Inflorescences small, 3–5-flowered.

• Slopes. Hubei.

33c. *Cotoneaster bullatus* var. *macrophyllus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 164. 1912.

大叶泡叶栒子 da ye pao ye xun zi

Cotoneaster rehderi Pojarkova.

Petiole ca. 2 mm; leaf blade obovate-elliptic or elliptic, rarely elliptic-oblong or lanceolate-oblong, 5–15 × 2.5–8 cm. Inflorescences 5–8 cm in diam., 11–31-flowered. Fruit globose, 7–9 mm, with 5 pyrenes.

• Thickets; 1300–2800 m. W Sichuan.

33d. *Cotoneaster bullatus* var. *floribundus* (Stapf) L. T. Lu & A. R. Brach, Novon 12: 496. 2002.

多花泡叶栒子 *duo hua pao ye xun zi*

Cotoneaster moupinensis Franchet f. *floribundus* Stapf, Bot. Mag. 135: t. 8284. 1909; *C. bullatus* f. *floribundus* (Stapf) Rehder & E. H. Wilson.

Petiole 1.5–2.5 mm; leaf blade ovate or obovate to elliptic, less than 5 cm. Inflorescences 4–6 cm in diam., (9–)15–31-flowered. Fruit with 4 or 5 pyrenes.

- Mountain forests; 900–2800 m. W Sichuan.

The name *Cotoneaster boisianus* (Klotz, Wiss. Z. Friedrich-Schiller-Univ. Jena, Mat. Naturwiss. Reihe 21: 987. 1972), synonymous with this taxon, is invalid under Arts. 8.1 and 37 of the St. Louis Code because Klotz cited two specimens (from different gatherings) as types.

34. *Cotoneaster acutifolius* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 5: 190. 1832.

灰栒子 *hui xun zi*

Shrubs deciduous, 2–4 m tall. Branchlets brownish or reddish brown, terete, slender, initially villous, glabrescent. Petiole 2–5(–10) mm, villous; stipules caducous, brown, linear-lanceolate, 3–5 mm, slightly villous; leaf blade elliptic-ovate to oblong-ovate, 2–4(–5) × 1–2(–3) cm, veins raised abaxially and impressed adaxially, adaxially glabrous or both surfaces initially villous, gradually glabrescent, subglabrous when old, base broadly cuneate, apex acute, rarely acuminate. Corymbs 2–4 cm, 2–5-flowered; rachis and pedicels villous; bracts linear-lanceolate, 3–5 mm, slightly pilose. Pedicel 3–5 mm. Flowers 7–8 mm in diam. Hypanthium campanulate or shortly cylindrical, abaxially glabrous or villous. Sepals triangular, 1–2 × 1.5–2 mm, apex acute or ± obtuse. Petals erect, white, tinged reddish, broadly obovate or oblong, 3.5–4.5 × 3–4 mm, glabrous, base somewhat long clawed, apex obtuse. Stamens 10–15, shorter than petals. Ovary densely villous apically; styles often 2, free, not exceeding stamens. Fruit black, ellipsoid, obovoid, or subglobose, 6–8(–10) mm in diam., villous; pyrenes 2 or 3. Fl. May–Jun, fr. Aug–Sep.

Slopes, foothills, gullies, forests, forest margins, thickets, mountain valleys, exposed grasslands; 1000–3700 m. Anhui, Gansu, Hebei, Henan, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan [Mongolia, Russia].

- 1a. Hypanthium abaxially glabrous or only slightly villous.
 - 2a. Leaf blade adaxially glabrous, abaxially villous; hypanthium abaxially glabrous or slightly villous 34c. var. *lucidus*
 - 2b. Leaf blade villous on both surfaces; hypanthium abaxially glabrous 34d. var. *glabricalyx*
- 1b. Hypanthium abaxially villous; leaf blade villous on both surfaces.
 - 3a. Abaxial surfaces of both leaf blade and hypanthium sparsely villous 34a. var. *acutifolius*
 - 3b. Abaxial surfaces of both leaf blade and hypanthium densely villous 34b. var. *villosulus*

34a. *Cotoneaster acutifolius* var. ***acutifolius***

灰栒子(原变种) *hui xun zi* (yuan bian zhong)

Cotoneaster acutifolius Turczaninow f. *glabriusculus* Hurusawa; *C. acutifolius* var. *laetevirens* Rehder & E. H. Wilson; *C. acutifolius* Turczaninow var. *pekinensis* Koehne; *C. hurusawaianus* G. Klotz; *C. konishii* Hayata; *C. laetevirens* (Rehder & E. H. Wilson) G. Klotz; *C. niger* var. *acutifolius* Wenzig; *C. ottoschwarzii* G. Klotz; *C. pekinensis* (Koehne) Zabel.

Leaf blade 2–4(–5) cm, both surfaces sparsely villous. Hypanthium sparsely villous abaxially. Fruit ellipsoid or obovoid, 6–8 mm in diam.

Slopes, foothills, gullies, forests; 1400–3700 m. Gansu, Hebei, Henan, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan [Mongolia].

34b. *Cotoneaster acutifolius* var. ***villosulus*** Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 158. 1912.

密毛灰栒子 *mi mao hui xun zi*

Cotoneaster dissimilis G. Klotz; *C. villosulus* (Rehder & E. H. Wilson) Flinck & Hylmö.

Leaf blade 3–5(–6) cm, both surfaces villous, more densely so abaxially. Hypanthium densely villous abaxially. Fruit ellipsoid or obovoid, 6–7 mm in diam.

- Mountain valleys, grassy slopes, thickets, forest margins; 1000–2200 m. Anhui, Gansu, Hebei, Hubei, Shaanxi, Sichuan, Taiwan, Xizang.

Further study is necessary to determine the identity of *Cotoneaster hummelii* J. Fryer & B. Hylmö, a doubtful species cultivated in the Botanic Garden in Göteborg (Sweden), which might be synonymous with this taxon.

34c. *Cotoneaster acutifolius* var. ***lucidus*** (Schlechtendal) L. T. Lu, Acta Phytotax. Sin. 38: 277. 2000.

甘南灰栒子 *gan nan hui xun zi*

Cotoneaster lucidus Schlechtendal, Linnaea 27: 541. 1854.

Leaf blade villous abaxially, glabrous adaxially. Hypanthium glabrous or only slightly villous abaxially. Fruit obovoid or subglobose, 8–10 mm in diam. $2n = 68$.

Rocky slopes, thickets; below 2900 m. S Gansu [Russia].

34d. *Cotoneaster acutifolius* var. ***glabricalyx*** Hurusawa, Acta Phytotax. Geobot. 13: 235. 1943.

光萼灰栒子 *guang e hui xun zi*

Leaf blade 2.5–3.5 cm, both surfaces villous, more densely so abaxially. Hypanthium glabrous abaxially. Fruit not seen.

- Mountain slopes; medium elevations. NC Henan (Song Shan).

35. *Cotoneaster moupinensis* Franchet, Nouv. Arch. Mus. Hist. Nat, sér. 2, 8: 224. 1885.

宝兴栒子 *bao xing xun zi*

Shrubs deciduous, to 5 m tall. Branchlets somewhat in-

flewed, grayish black, with conspicuous lenticels, terete, initially strigose, gradually glabrescent. Petiole 2–4(–8) mm, pubescent; stipules caducous; leaf blade elliptic-ovate or rhombic-ovate, 4–12 × 2–4.5 cm; veins prominently raised abaxially and impressed adaxially, abaxially pubescent along reticulate veins, adaxially slightly pilose, rugose, bullate, base broadly cuneate or subrounded, apex acuminate. Corymbs usually 9–25-flowered; rachis and pedicels pubescent; bracts lanceolate, sparsely pubescent. Pedicel 2–3 mm. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular, apex acute. Petals erect, pink, ovate or suborbicular, 3–4 × 2–3 mm, apex obtuse. Stamens ca. 20, shorter than petals. Ovary pubescent at apex; styles 4 or 5, free, not exceeding stamens. Fruit black, subglobose or obovoid, 6–8 mm in diam.; pyrenes 4 or 5. Fl. Jun–Jul, fr. Sep–Oct. $2n = 68^*$.

• Forest margins, coniferous forests, stream sides; 1300–3200 m. Gansu, Guizhou, Hubei, Ningxia, Shaanxi, Sichuan, Xizang, Yunnan.

36. *Cotoneaster foveolatus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 162. 1912.

麻核栒子 ma he xun zi

Cotoneaster cornifolius Flinck & Hylmö; *C. obscurus* Rehder & E. H. Wilson var. *cornifolius* Rehder & E. H. Wilson.

Shrubs deciduous, to 3 m tall. Branchlets dark reddish brown, terete, initially densely yellow strigose, glabrescent. Petiole 2–4 mm, pubescent; stipules partly persistent, linear or lanceolate, 3–4 mm, pubescent; leaf blade elliptic, elliptic-ovate, or elliptic-obovate, (2–)3.5–8(–10) × (1.2–)1.5–3(–4.5) cm, veins prominently raised abaxially and impressed adaxially, abaxially initially pubescent, more densely so along veins, subglabrous when old, adaxially sparsely pubescent, glabrescent, base broadly cuneate or subrounded, apex acuminate or acute. Corymbs 3–7-flowered; rachis and pedicels pubescent; bracts linear, 2–3 mm, pubescent. Pedicel 3–4 mm. Flowers 7–8 mm. Hypanthium campanulate, abaxially pilose. Sepals triangular, 1.5–2 × 2–2.5 mm, apex acute. Petals erect, pink, obovate or suborbicular, 4–5 × 3–4 mm, base shortly clawed, apex obtuse. Stamens 15–17, shorter than petals. Ovary densely pilose apically; styles often 3, rarely 2–5, free, very short. Fruit black, subglobose, 8–9 mm in diam.; pyrenes 3 or 4, furrowed and shallowly pitted on back. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Thickets, dense forests, forest margins, near water courses, waste fields; 1400–3400 m. Gansu, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Xizang, Yunnan.

Further study is necessary to determine the identity of *Cotoneaster hsingshangensis* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

37. *Cotoneaster ambiguus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 159. 1912.

川康栒子 chuan kang xun zi

Cotoneaster acutifolius Turczaninow var. *ambiguus* (Rehder & E. H. Wilson) Hurusawa; *C. pseudoambiguus* J. Fryer & B. Hylmö.

Shrubs deciduous, to 2 m tall. Branchlets reddish brown or grayish brown, slender, initially strigose, subglabrous or gla-

brous when old. Petiole 2–5 mm, pilose; stipules usually caducous, lanceolate or linear-lanceolate, pilose; leaf blade elliptic-ovate to rhombic-ovate, 2.5–6 × 1.5–3 cm, abaxially initially pubescent, glabrate, adaxially pilose, soon glabrescent, base broadly cuneate, apex acuminate or acute. Corymbs 1.5–3.5 cm, 5–10-flowered; rachis and pedicels pilose; bracts caducous, lanceolate or linear, 2–3 mm, pilose. Pedicel 4–6 mm. Flowers 7–8 mm in diam. Hypanthium abaxially initially pilose, finally glabrous or subglabrous. Sepals triangular, 1–1.5 × 2–2.5 mm, apex acute. Petals erect, white, stained pinkish, broadly ovate or suborbicular, 3–4 mm and ca. as broad, base shortly clawed, apex obtuse or erose. Stamens 20, slightly shorter than petals. Ovary densely pilose apically; styles 2–5, free, somewhat not exceeding stamens. Fruit black, ovoid or subglobose, 8–10 × 6–7 mm, pilose apically; pyrenes 2 or 3, rarely 4 or 5. Fl. May–Jun, fr. Sep–Oct.

• Mountain regions, semiopen slopes, sparse forests, forest margins; 1800–3000 m. Gansu, Guizhou, Hubei, Ningxia, Shaanxi, Sichuan, Yunnan.

38. *Cotoneaster buxifolius* Wallich ex Lindley, Bot. Reg. 15: sub t. 1229. 1829.

黄杨叶栒子 huang yang ye xun zi

Shrubs evergreen to semievergreen, low, to 1.5(–3) m tall. Branchlets dark grayish brown or brownish, terete, initially densely whitish tomentose, glabrate. Petiole 1–3 mm, tomentose; stipules caducous, subulate, 2–3 mm, tomentulose; leaf blade elliptic to elliptic-obovate, 5–10(–16) × (2–)4–9 mm, abaxially densely gray tomentose, adaxially initially appressed pubescent, glabrescent, base narrowly to broadly cuneate, apex acute and mucronate, rarely ± obtuse. Inflorescences (1- or)3–5(–9)-flowered; bracts lanceolate, nearly as long as pedicels, tomentose. Pedicel 3–5 mm, tomentose. Flowers 7–9 mm in diam. Hypanthium campanulate, abaxially tomentose. Sepals ovate-triangular, 1.5–2 mm, apex acute. Petals spreading, white, suborbicular or broadly ovate, 3–4 mm in diam., glabrous, base shortly clawed, apex obtuse. Stamens 20, slightly shorter than petals. Ovary pubescent apically; styles 2, free, nearly as long as stamens. Fruit red, subglobose, 5–6 mm in diam.; pyrenes usually 2. Fl. Apr–Jun, fr. Sep–Oct.

Mountain regions, rocky mountain slopes, thickets, roadsides; 1000–3900 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].

- 1a. Dwarf shrub to 0.5–1 m tall; pedicel, hypanthium and sepals abaxially initially sparsely villous-tomentose, glabrate; flowers 1 or 2(–4); leaves apically obtuse, rarely ± acute and mucronulate 38c. var. *rockii*
- 1b. Shrub 1–3 m tall; pedicel, hypanthium and sepals abaxially densely and persistently strigose-tomentose; flowers (1–)3–5(–9); leaves apically mucronate or mucronulate.
 - 2a. Shrub 1–2 m tall; leaves elliptic to elliptic-obovate, 5–10 mm or slightly longer, apex acute and mucronate, rarely ± obtuse; flowers (1–)3–5(–9) 38a. var. *buxifolius*

- 2b. Shrub to 3 m tall; leaves elliptic, rarely obovate-elliptic, 7–16 mm, apex obtuse and mucronulate; flowers 2–5(–8) 38b. var. *marginatus*

38a. *Cotoneaster buxifolius* var. *buxifolius*

黄杨叶栒子(原变种) *huang yang ye xun zi* (*yuan bian zhong*)

Cotoneaster argenteus G. Klotz; *C. breviremeus* Rehder & E. H. Wilson; *C. buxifolius* f. *vellaeus* Franchet; *C. buxifolius* var. *vellaeus* (Franchet) G. Klotz; *C. hodjingsensis* G. Klotz; *C. lidjiangensis* G. Klotz; *C. microphyllus* Wallich ex Lindley var. *buxifolius* Dippel; *C. microphyllus* var. *vellaeus* (Franchet) Rehder & E. H. Wilson.

Shrubs evergreen to semievergreen, 1–2 m tall. Leaf blade elliptic to elliptic-obovate, 5–10 mm or slightly longer, abaxially gray tomentose, apex usually acute and mucronate. Inflorescences 3–5(–9)-flowered, rarely flowers solitary. Pedicels, hypanthium, and sepals abaxially densely and persistently strigose-tomentose.

Rocky mountain slopes, thickets, roadsides; 1000–3300 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].

Zhou and Wu (Acta Bot. Yunnan. 23: 29–36. 2001) treated *Cotoneaster buxifolius* f. *vellaeus* as a synonym of *C. poluninii* G. Klotz (from Nepal) and recognized *C. delavayanus* G. Klotz as a distinct species. Although they are sometimes aligned here, we consider both *C. astrophoros* J. Fryer & E. C. Nelson and *C. delavayanus* to be doubtful species.

38b. *Cotoneaster buxifolius* var. *marginatus* Loudon, Encycl. Trees Shrubs 411. 1842.

多花黄杨叶栒子 *duo hua hang yan ye xun zi*

Cotoneaster marginatus Lindley ex Loudon; *C. microphyllus* Wallich ex Lindley var. *buxifolius* Dippel f. *lanatus* Dippel; *C. prostratus* var. *lanatus* (Dippel) Rehder; *C. rotundifolius* Wallich ex Lindley var. *lanatus* (Dippel) C. K. Schneider.

Shrubs evergreen, to 3 m tall. Leaf blade elliptic, rarely obovate-elliptic, 7–16 mm, abaxially tomentose, apex obtuse and mucronulate. Inflorescences 2–5(–8)-flowered. Pedicels, hypanthium, and sepals abaxially densely and persistently strigose-tomentose.

Mountain regions; 2500–3300 m. SE Xizang [Bhutan, India].

Zhou & Wu (Acta Bot. Yunnan. 23: 29–36. 2001) treated this variety as a synonym of var. *buxifolius*.

38c. *Cotoneaster buxifolius* var. *rockii* (G. Klotz) L. T. Lu & A. R. Brach, **comb. et stat. nov.**

西南黄杨叶栒子 *xi nan huang yang ye xun zi*

Basionym: *Cotoneaster rockii* G. Klotz, Wiss. Z. Martin Luther Univ. Halle-Wittenberg, Math.-Naturwiss. Reihe 12: 775. 1963; *C. insolitus* G. Klotz.

Shrubs evergreen, dwarf, 0.5–1 m tall. Leaves elliptic or broadly lanceolate, rarely oblong-oblancoate, 6.5–12 mm, abaxially sparsely villous-tomentose or more so, apex usually obtuse, rarely ± acute and mucronulate. Flowers 1 or 2, rarely 3

or 4. Pedicels, hypanthium, and sepals abaxially sparsely villous-tomentose, gradually glabrescent.

• Rocks and boulders in high mountain regions; 3000–3900 m. SW Sichuan, SE Xizang, Yunnan.

39. *Cotoneaster dammeri* C. K. Schneider, III. Handb. Laubholz. 1: 761. 1906.

矮生栒子 *ai sheng xun zi*

Shrubs evergreen, low. Branches creeping, usually rooting at nodes. Branchlets dark grayish brown to grayish black, terete, initially yellowish appressed pilose, glabrous when old. Petiole 2–3(–10) mm, initially yellowish pilose, glabrous when old; stipules mostly caducous, linear-lanceolate or lanceolate, 2–4 mm, puberulent; leaf blade elliptic to oblong-elliptic or obovate, 1–2(–3) × 0.7–2.2 cm, thickly leathery, lateral veins 4–6 pairs, somewhat raised abaxially and impressed adaxially, abaxially slightly glaucous, initially appressed pilose, glabrate, adaxially lustrous, glabrous, base broadly cuneate to rounded, apex obtuse, emarginate, or ± acute. Inflorescences ca. 1 cm in diam., usually 1-flowered, rarely 2- or 3-flowered corymbs; bracts linear-lanceolate, 2–3 mm, pilose. Pedicel 4–6 mm, rarely to 1.5 cm, pilose. Hypanthium campanulate, abaxially puberulent. Sepals triangular, 1.5–2 mm and nearly as broad, apex acute. Petals spreading, white, suborbicular or broadly ovate, 4–5 mm in diam., glabrous, base shortly clawed, apex obtuse. Stamens 20, unequal in length; anthers purple. Ovary pilose apically; styles (3 or)4 or 5, free, nearly as long as stamens. Fruit bright red, subglobose, 6–7 mm in diam., glabrous; pyrenes (3 or)4 or 5. Fl. May–Jun, fr. Sep–Oct. $2n = 34^*$.

• Mountain areas, rocks, sparse mixed forests; 1300–4100 m. Gansu, Guizhou, Hubei, Sichuan, Xizang, Yunnan.

- 1a. Petiole 2–3 mm; leaf blade elliptic or oblong-elliptic; pedicel 4–6 mm 39a. var. *dammeri*
- 1b. Petiole 6–10 mm; leaf blade usually obovate; pedicel 10–15 mm 39b. var. *radicans*

39a. *Cotoneaster dammeri* var. *dammeri*

矮生栒子(原变种) *ai sheng xun zi* (*yuang bian zhong*)

Cotoneaster dammeri subsp. *songmingensis* C. Y. Wu & Lihua Zhou; *C. humifusus* Duthie ex Veitch; *C. kweitschowsiensis* G. Klotz.

Petiole 2–3 mm; leaf blade elliptic or oblong-elliptic. Pedicel 4–6 mm.

• Rocky mountain areas, sparse mixed forests; 1300–2600 m. Gansu, Guizhou, Hubei, Sichuan, Yunnan.

39b. *Cotoneaster dammeri* var. *radicans* (Dammer ex C. K. Schneider) C. K. Schneider, III. Handb. Laubholz. 1: 761. 1906.

长柄矮生栒子 *chang bing ai sheng xun zi*

Cotoneaster radicans Dammer ex C. K. Schneider, III. Handb. Laubholz. 1: 761. 1906.

Petiole 6–10 mm; leaf blade usually obovate. Pedicels 1–1.5 cm.

• Mountain areas, rocks; 2000–4100 m. Gansu, Hubei, Sichuan, Xizang.

Zhou et al. (Acta Bot. Yunnan. 22: 379–382. 2000) treated this variety as a synonym of var. *dammeri*.

40. *Cotoneaster morrisonensis* Hayata, Icon. Pl. Formosan. 5: 62. 1915.

台湾栒子 tai wan xun zi

Cotoneaster rokujodaisanensis Hayata.

Shrubs semievergreen, prostrate, less than 1 m tall, much branched. Branchlets grayish brown to reddish brown, terete, initially strigose, glabrous when old. Petiole 2–3(–5) mm, pilose; stipules partly persistent, linear-lanceolate, puberulent; leaf blade ovate or oblong-ovate, rarely obovate, 9–15(–20) × (5–)6–10 mm, thickly leathery, midvein raised abaxially and impressed adaxially, abaxially initially appressed pilose, later subglabrous, adaxially glabrous, base cuneate to obtuse, margin entire and revolute, apex acute, rounded, emarginate, or mucronate. Inflorescences axillary or terminal, 1-flowered. Flower 7–8 mm in diam. Hypanthium campanulate, abaxially pilose. Sepals triangular or triangular-ovate. Petals white, broadly obovate, base shortly clawed, apex emarginate. Stamens 10–15. Carpels 2 or 3; styles 2 or 3. Fruit red, ellipsoid-ovate or ellipsoid, 7–8 × 5–6(–8) mm; pyrenes 2 or 3. Fl. May–Jul, fr. Jul–Oct.

• Sunny rocky grasslands, rocky cliffs, open sunny slopes, high mountain areas; 2200–3500 m. Taiwan.

41. *Cotoneaster microphyllus* Wallich ex Lindley, Bot. Reg. 13: t. 1114. 1827.

小叶栒子 xiao ye xun zi

Shrubs evergreen, low, to 1 m tall, with stiffly spreading branches. Branchlets reddish brown to blackish brown, terete, initially yellow pubescent, gradually glabrate. Petiole 1–2 mm to more than 4 mm, pubescent; stipules caducous, lanceolate or linear, nearly as long as petioles, slightly pubescent; leaf blade obovate to oblong-obovate, 4–10(–16) × 4–8 mm, thickly leathery, midvein raised abaxially and impressed adaxially, abaxially gray pubescent, rarely glabrous, adaxially glabrous or sparsely pubescent, base broadly cuneate, margin revolute, apex obtuse, rarely emarginate or ± acute. Inflorescences 1(–3)-flowered. Flowers 8–10 mm in diam. Pedicel 2–3 mm, sparsely pubescent. Hypanthium campanulate, abaxially pubescent at least initially. Sepals ovate-triangular, 1–1.5 mm and nearly as broad, apex obtuse. Petals spreading, white, suborbicular, ca. 4 mm and ca. as broad, base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pubescent apically; styles 2, free, somewhat not exceeding stamens. Fruit scarlet-red, globose, 5–6(–10) mm in diam.; pyrenes 2. Fl. May–Jun, fr. Aug–Sep. $2n = 34, 51, 68^*$, 102.

Rocks, slopes, high mountain areas, thickets, roadsides; 2000–4200 m. Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Sikkim].

Zhou & Wu (Acta Bot. Yunnan. 21: 160–166. 1999) treated the following varieties as synonyms of the species.

1a. Leaves pubescent on both surfaces.

2a. Leaves obovate to oblong-obovate, 4–7 mm in diam.;

petals white 41a. var. *microphyllus*

2b. Leaves narrowly oblong or oblong-ovate to linear-lanceolate, 1.5–5(–7) mm in diam.; petals pinkish white 41b. var. *thymifolius*

1b. Leaves glabrous on both surfaces or only pubescent abaxially.

3a. Leaves glabrous on both surfaces, rarely abaxially subglabrous, glabrescent, petioles 1–2 mm; petals pinkish; hypanthium and sepals abaxially initially sparsely pubescent, glabrescent 41c. var. *glacialis*

3b. Leaves adaxially glabrous, abaxially grayish white pubescent; petioles 2–4 mm; petals white; hypanthium and sepals abaxially densely persistently long gray pubescent 41d. var. *cochleatus*

41a. *Cotoneaster microphyllus* var. *microphyllus*

小叶栒子(原变种) xiao ye xun zi (yuan bian zhong)

Cotoneaster buxifolius Lindley f. *melanotrichus* Franchet; *C. cochleatus* (Franchet) G. Klotz f. *melanotrichus* (Franchet) G. Klotz; *C. elatus* G. Klotz; *C. melanotrichus* (Franchet) G. Klotz; *C. microphyllus* f. *melanotrichus* (Franchet) Handel-Mazzetti; *C. microphyllus* var. *melanotrichus* (Franchet) Rehder & E. H. Wilson.

Leaves obovate to oblong-obovate, 4–10 × 4–7 mm, both surfaces pubescent. Petals white.

Rocky mountain slopes, thickets, roadsides; 2500–4200 m. Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Sikkim].

41b. *Cotoneaster microphyllus* var. *thymifolius* (Baker) Koehne, Mitt. Deutsch. Dendrol. Ges. 227. 1893.

细叶小叶栒子 xi ye xiao ye xun zi

Cotoneaster thymifolius Baker in Saunders, Refug. Bot. 1: t. 50. 1869; *C. integrifolius* (Roxburgh) G. Klotz; *C. linearifolius* (G. Klotz) G. Klotz; *C. microphyllus* f. *linearifolius* G. Klotz; *Crataegus integrifolia* Roxburgh.

Leaves narrowly oblong or oblong-obovate to linear-lanceolate, 4–16 × 1.5–5(–7) mm, both surfaces pubescent. Petals pinkish white. $2n = 51, 68$.

High mountain areas; 3000–4000 m. SE Xizang, NW Yunnan [India, Kashmir, Nepal, Sikkim].

41c. *Cotoneaster microphyllus* var. *glacialis* J. D. Hooker ex Wenzig, Linnæa 38: 195. 1874.

无毛小叶栒子 wu mao xiao ye xun zi

Cotoneaster congestus Baker; *C. glacialis* (J. D. Hooker ex Wenzig) G. Panigrahi & A. Kumar; *C. microphyllus* var. *navalis* G. Klotz.

Petiole 1–2 mm; leaf blade usually elliptic, 6–12 × 4–7 mm, both sides glabrous or abaxially subglabrous, glabrescent. Hypanthium and sepals abaxially initially sparsely pubescent, glabrescent. Petals pinkish.

High mountain areas, rocks; 3900–4200 m. SE Xizang, NW Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Sikkim].

41d. *Cotoneaster microphyllus* var. *cochleatus* (Franchet) Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 176. 1912.

白毛小叶栒子 *bai mao xiao ye xun zi*

Cotoneaster buxifolius Lindley f. *cochleatus* Franchet, Pl. Delavay. 224. 1890; *C. cochleatus* (Franchet) G. Klotz; *C. thymifolius* var. *cochleatus* (Franchet) Franchet.

Petiole 2–4 mm; leaf blade elliptic or ovate-elliptic, 5–11 × 3–8 mm, abaxially grayish white pubescent, adaxially glabrous, margin revolute. Hypanthium and sepals abaxially densely persistently long gray pubescent. Petals white. $2n = 68$.

Rocks, slopes; 2000–3000 m. Sichuan, Yunnan [Bhutan, Nepal].

42. *Cotoneaster conspicuus* Comber ex Marquand, Bull. Misc. Inform. Kew 1937: 119. 1937.

大果栒子 *da guo xun zi*

Cotoneaster microphyllus var. *conspicuus* Messel; *C. conspicuus* var. *decorus* Russel; *C. conspicuus* var. *nanus* G. Klotz; *C. nanus* (G. Klotz) G. Klotz; *C. permutatus* Klotz; *C. pluriflorus* G. Klotz.

Shrubs, evergreen, suberect, to 1.2 m tall or more, densely branched. Branchlets ascending, straight or subarcuate, to 45 cm, spreading, initially strigose-villous, gradually glabrescent. Petiole 1.5–2.5 mm; stipules subulate, villous, nearly as long as petioles; leaf blade elliptic to oblanceolate, rarely oblong, 6–16 (–20) × 2.5–6.5 (–10) mm, midvein raised abaxially, impressed adaxially, veins inconspicuous, abaxially appressed villous, adaxially glabrous or sparsely villous, base cuneate, margin revolute, apex obtuse or rounded and callous-mucronate. Inflorescences often solitary flowers, rarely few flowered. Pedicel 1.5–2 mm, sparsely villous. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially sparsely villous. Sepals broadly triangular, ca. 1.5 mm and nearly as broad. Petals spreading, white, tipped with pink in bud, suborbicular, 3–4 × 4–5 mm. Filaments yellow, subequal; anthers purple, subglobose. Ovary glabrous; styles 2, ca. 3 mm. Fruit bright scarlet, globose or obovoid, glabrous, 8–10 mm in diam.; pyrenes 2; sepals persistent at fruiting, suberect. Fl. May–Jun, fr. Aug–Sep.

• Open sunny situations among rocks, river valleys; 2400–3300 m. Sichuan, S Xizang, Yunnan.

Comber (Gard. Chron., ser. 3, 99: 388. 1936) previously described this species (but without a Latin description or diagnosis) from plants grown from seeds collected by F. Kingdon Ward in Xizang in 1924.

43. *Cotoneaster sherriffii* G. Klotz, Wiss. Z. Martin-Luther-Univ. Halle-Wittenberg, Math.-Naturwiss. Reihe 12: 776. 1963.

康巴栒子 *kang ba xun zi*

Cotoneaster ludlowii G. Klotz; *C. muliensis* G. Klotz; *C.*

schlechtendalii G. Klotz.

Shrubs semievergreen, erect, to 1.5 m tall, with dense, ascending branches. Branchlets grayish brown, initially sparsely accumbent strigose, glabrate, densely gray lenticellate when old. Petiole 1–3 mm, villous; stipules lanceolate or linear-lanceolate, 2–3 mm, membranous, villous; leaf blade dark green adaxially, oblong-obovate, rarely oblanceolate, 6–12 × 4–8 mm, subleathery, abaxially densely yellowish gray appressed villous, adaxially villous, base cuneate, apex obtuse and mucronate. Corymbs erect, 1–2.5 cm, 3–9 (–11)-flowered; rachis and pedicels initially villous, glabrescent. Flowers 9–10 mm in diam. Hypanthium campanulate, abaxially ± villous. Sepals triangular, apex acute. Petals white or pinkish, suborbicular, 3–4 mm in diam., adaxially puberulous near base, base broadly clawed, apex obtuse. Stamens shorter than petals. Carpels 1 or 2; styles not exceeding stamens. Fruit red, globose, 5–7 mm in diam., glabrous; pyrenes 1 or 2 united into 1. Fl. May–Jun, fr. Sep–Oct. $2n = 68$.

River valleys, forests, slopes; 2700–4100 m. W Sichuan, SE Xizang [Bhutan].

Zhou & Wu (Acta Bot. Yunnan. 21: 160–166. 1999) treated this species as a synonym of *Cotoneaster conspicuus*.

44. *Cotoneaster rotundifolius* Wallich ex Lindley, Bot. Reg. 15: sub t. 1229. 1829.

圆叶栒子 *yuan ye xun zi*

Cotoneaster distichus Lange var. *tongolensis* C. K. Schneider; *C. microphyllus* Wallich ex Lindley var. *rotundifolius* (Wallich ex Lindley) Wenzig; *C. microphyllus* var. *uva-ursi* Lindley; *C. prostratus* Baker; *C. rotundifolius* var. *tongolensis* (C. K. Schneider) Rehder.

Shrubs evergreen, to 4 m tall. Branchlets spreading, grayish brown to blackish brown, initially appressed villous, glabrous when old. Petiole 1–3 mm, pilose; stipules persistent or caducous, lanceolate, puberulous; leaf blade suborbicular or broadly ovate, 0.8–2 cm × 6–10 mm, abaxially pilose, adaxially glabrous, rarely puberulous, base broadly cuneate to rounded, apex obtuse or emarginate, sometimes acute and mucronate. Inflorescences 1–3-flowered; bracts caducous, linear-lanceolate. Pedicel 2–4 mm, pubescent. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially pilose. Sepals triangular, apex acute. Petals spreading, white or tinged reddish, broadly ovate or obovate, 4–5 mm and nearly as broad, base very shortly clawed, apex obtuse or emarginate. Stamens 20, ca. as long as or somewhat shorter than petals. Ovary pilose apically; styles 2 or 3, free, nearly equaling or lower than stamens. Fruit red, obovoid, 7–9 mm in diam.; pyrenes 2 or 3. Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

Grassy slopes, rocks, mountain summits; 1200–4000 m. W Sichuan, SE Xizang, NW Yunnan [Bhutan, India, Nepal].

Further study is necessary to determine the identity of *Cotoneaster subalpinus* G. Klotz, which might be synonymous with this taxon.

45. *Cotoneaster rubens* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 24. 1917.

红花栒子 *hong hua xun zi*

Shrubs deciduous to semievergreen, erect or prostrate, 0.5–2 m tall, usually irregularly branched. Branchlets grayish black, terete, robust, initially strigose, glabrous when old. Petiole short, 1–2 mm, stout, pubescent; stipules caducous; leaf blade suborbicular or broadly elliptic, (0.8–)1–2.3 × (0.6–)0.8–1.8 cm, veins raised abaxially and impressed adaxially, abaxially densely yellow tomentose, adaxially glabrous, base rounded, apex obtuse or mucronate, rarely acute. Inflorescences usually 1-flowered. Flowers 8–9 mm in diam., shortly pedicellate. Hypanthium campanulate, abaxially pilose. Sepals triangular, 1–2 × 1.5–2.5 mm, apex ± obtuse. Petals erect, dark red, orbicular to broadly obovate, 4–5 mm in diam., apex obtuse. Stamens 20, shorter than petals. Ovary pilose apically; styles 2 or 3, free, somewhat not exceeding stamens. Fruit red, obovoid, 8–9 mm in diam.; pyrenes 2 or 3. Fl. Jun–Jul, fr. Sep–Oct.

Dense forests on slopes, forest margins, grasslands, rocky places; 3000–4100 m. W Sichuan, SE Xizang, NW Yunnan [Bhutan, N Myanmar].

- 1a. Leaf blade 10–23 × 8–18 mm, apex obtuse or mucronate, sometimes acute; fruit usually with 2 or 3 pyrenes 45a. var. *rubens*
- 1b. Leaf blade 8–10 × 6–8 mm, apex obtuse or slightly mucronate; fruit usually with 3 pyrenes 45b. var. *minimus*

45a. *Cotoneaster rubens* var. *rubens*

红花栒子(原变种) hong hua xun zi (yuan bian zhong)

Cotoneaster notabilis G. Klotz.

Leaf blade 1–2.3 × 0.8–1.8 cm, apex obtuse and mucronate, sometimes acute. Fruit usually with 2 or 3 pyrenes.

Dense forests on slopes, forest margins, grasslands; 3000–4100 m. SE Xizang, NW Yunnan [Bhutan, N Myanmar].

45b. *Cotoneaster rubens* var. *minimus* T. T. Yu, Acta Phytotax. Sin. 8: 220. 1963.

小叶红花栒子 xiao ye hong hua xun zi

Leaf blade 8–10 × 6–8 mm, apex obtuse or slightly mucronate. Fruit usually with 3 pyrenes.

- Rocky places. W Sichuan.

Zhou & Wu (Acta Bot. Yunnan. 23: 29–36. 2001) treated this variety as a synonym of *Cotoneaster buxifolius*.

46. *Cotoneaster uniflorus* Bunge in Ledebour, Fl. Altaic. 2: 220. 1830.

单花栒子 dan hua xun zi

Cotoneaster integerrimus Medikus var. *uniflorus* (Bunge) C. K. Schneider; *C. vulgaris* Lindley var. *uniflorus* (Bunge) Regel.

Shrubs deciduous, sometimes prostrate, 30–40(–100) cm tall, spreading. Branchlets grayish brown to grayish black, terete, slender, initially densely yellow pubescent, gradually glabrescent. Petiole (2.5–)3–5 mm, puberulous; stipules purplish red, lanceolate, pilose; leaf blade usually ovate, rarely ovate-elliptic, 1.8–3.5 × 1.3–2.5 cm, abaxially initially tomentose,

subglabrous when old, adaxially glabrous, base broadly cuneate to rounded, apex acute, rarely ± obtuse or emarginate. Inflorescences axillary, 1(or 2)-flowered. Pedicel very short, pilose. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, longer than or nearly as long as petals, margin sometimes with few shallow teeth, apex ± obtuse or acute. Petals erect, pink, suborbicular, 3–3.5 mm and ca. as broad, base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pubescent apically; styles 2 or 3(or 4), free, not exceeding stamens. Fruit red, globose, 6–7(–10) mm in diam.; pyrenes (2 or)3(or 4). Fl. May–Jun, fr. Aug–Sep. $2n = 34$.

Forests; 1000–2100 m. Qinghai, Xinjiang [NW Mongolia, Russia].

47. *Cotoneaster adpressus* Bois in Vilmorin & Bois, Frutic. Vilm. 116. 1904.

匍匐栒子 pu fu xun zi

Cotoneaster horizontalis Decaisne var. *adpressus* (Bois) C. K. Schneider; *C. taoensis* G. Klotz.

Shrubs deciduous, prostrate, irregularly branched. Branchlets reddish brown or grayish brown to grayish black, terete, slender, initially strigose, glabrous when old. Petiole 1–2 mm, glabrous or pilose; stipules caducous, subulate, nearly as long as petioles; leaf blade broadly ovate or obovate, rarely elliptic, 5–15 × 4–10 mm, thinly papery, midvein raised abaxially and impressed adaxially, abaxially sparsely pubescent or glabrous, adaxially glabrous, base cuneate, margin entire and undulate, apex obtuse or ± acute. Inflorescences 1- or 2-flowered. Flowers subsessile, 7–8 mm in diam. Hypanthium campanulate, abaxially sparsely pubescent. Sepals ovate-triangular, apex acute, shorter than petals. Petals erect, pink, obovate, 4–5 mm and nearly as broad, apex emarginate or obtuse. Stamens ca. 10–15, shorter than petals. Ovary pubescent apically; styles 2, free, not exceeding stamens. Fruit bright red, subglobose, 7–9 mm in diam., glabrous; pyrenes 2, rarely 3. Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

Mixed forests on slopes, rocky places; 1900–4000 m. Gansu, Guizhou, Hubei, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan [India, Myanmar, Nepal].

48. *Cotoneaster subadpressus* T. T. Yu, Acta Phytotax. Sin. 8: 219. 1963.

高山栒子 gao shan xun zi

Shrubs deciduous or semievergreen, prostrate, low. Branchlets grayish black when old, stout, initially densely pilose, glabrous when old. Petiole 1–2 mm, pilose; stipules caducous, linear or subulate; leaf blade suborbicular or broadly ovate, 4–8(–12) mm and ca. as broad, thickly leathery, midvein raised abaxially and impressed adaxially, lateral veins inconspicuous, both surfaces and margin initially pubescent, glabrous when old, base broadly cuneate to rounded, margin thick, apex obtuse or acute. Inflorescences 1-flowered. Flowers 4–6 mm in diam., subsessile or shortly pedicellate. Hypanthium campanulate, abaxially pubescent. Sepals triangular, apex acute or obtuse. Petals erect, pink, obovate or suborbicular, 3–4 × 2–3 mm,

base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pubescent apically; styles 2, free, somewhat not exceeding stamens. Fruit ovoid, 5–6 mm in diam.; pyrenes 2. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Rocky slopes of high mountains, coniferous forests, forest margins; 3000–3600 m. Sichuan, W Yunnan.

49. *Cotoneaster horizontalis* Decaisne, Fl. Serres Jard. Eur. 22: 168. 1877.

平枝栒子 ping zhi xun zi

Shrubs deciduous or semievergreen, procumbent, usually to 50 cm tall, sometimes taller, with horizontally spreading, distichously much branched stems. Branchlets blackish brown, terete, initially strigose, glabrous when old. Petiole 1–3 mm, pubescent; stipules caducous, brown, subulate or lanceolate, 2–4 mm, puberulous; leaf blade suborbicular or broadly elliptic, rarely obovate, 6–14 × 4–9 mm, midvein raised abaxially and ± impressed adaxially, abaxially sparsely accumbent pubescent, adaxially glabrous, base cuneate, apex usually acute. Inflorescences 1- or 2-flowered. Pedicel short to nearly absent. Flowers 5–7 mm in diam. Hypanthium campanulate, abaxially sparsely pubescent. Sepals triangular, 1–1.5 × 1–2 mm, apex acute. Petals erect, pink, reddish, or whitish, 3–4 × 2–3 mm, base shortly clawed, apex obtuse. Stamens ca. 12, shorter than petals. Ovary pilose apically; styles (2 or)3, free, not exceeding stamens. Fruit bright red, subglobose or ellipsoid, (3–)5–7 mm in diam.; pyrenes 3, rarely 2. Fl. May–Jun, fr. Sep–Oct.

Thickets, rocks, rocky slopes, dry mountain areas; 1500–3500 m. Gansu, Guizhou, Hubei, Hunan, Jiangsu, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Nepal].

Plants with somewhat larger leaves, clearly and very strikingly variegated with white, have been described as *Cotoneaster horizontalis* var. *variegatus* Osborn (Gard. Chron., ser. 3, 72: 351. 1922). They are grown as ornamentals, particularly in rock gardens.

- 1a. Fruit subglobose, 5–7 mm in diam., with 3 pyrenes, rarely only 2 49a. var. *horizontalis*
- 1b. Fruit ellipsoid, 3–4 mm in diam., usually with 2 pyrenes 49b. var. *perpusillus*

49a. *Cotoneaster horizontalis* var. *horizontalis*

平枝栒子(原变种) ping zhi xun zi (yuan bian zhong)

Cotoneaster acuminatus Lindley var. *prostratus* Hooker ex Decaisne; *C. symonsii* Loudon ex Koehne; *Diospyros chaffanjonii* H. Lévillé.

Leaf blade 6–14 mm, not variegated with white. Fruit subglobose, 5–7 mm in diam.; pyrenes 3, rarely 2.

Thickets, rocky slopes, dry mountain areas; 2000–3500 m. Gansu, Guizhou, Hubei, Hunan, Jiangsu, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Nepal].

Further study is necessary to determine the identities of *Cotoneaster atropurpureus* Flinck & B. Hylmø and *C. finckii* J. Fryer & B. Hylmø, which might be synonymous with this taxon.

49b. *Cotoneaster horizontalis* var. *perpusillus* C. K. Schneider, Ill. Handb. Laubholz. 1: 745. 1906.

小叶平枝栒子 xiao ye ping zhi xun zi

Cotoneaster distichus Lange var. *perpusillus* (C. K. Schneider) C. K. Schneider; *C. perpusillus* (C. K. Schneider) Flinck & Hylmø.

Leaf blade 6–8 mm, not variegated with white. Fruit ellipsoid, 5–6 × 3–4 mm; pyrenes usually 2. $2n = 68^*$.

• Rocks, rocky slopes; 1500–2500 m. Guizhou, Hubei, Shaanxi, Sichuan.

50. *Cotoneaster divaricatus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 157. 1912.

散生栒子 san sheng xun zi

Shrubs deciduous, erect, 1–2 m tall, sparsely branched. Branchlets spreading, dark reddish brown or dark grayish brown, terete, slender, initially strigose, glabrous when old. Petiole 1–2(–3) mm, pubescent; stipules caducous, linear-lanceolate, 2–5 mm, slightly pubescent; leaf blade elliptic or broadly elliptic, rarely obovate, 0.7–2 cm × 5–10 mm, midvein raised abaxially and ± impressed adaxially, both surfaces initially pubescent, adaxially subglabrous when old, base broadly cuneate, apex acute, rarely ± obtuse, sometimes mucronate. Inflorescences 5–6 mm in diam., 2–4-flowered; bracts caducous, linear-lanceolate, slightly pubescent. Pedicel 1–2 mm, sparsely pubescent. Flowers 3–4 mm. Hypanthium sparsely pubescent abaxially. Sepals triangular, 1–2 mm, apex acute. Petals erect, pink, ovate or oblong, 3–4 × 2–3 mm, base shortly clawed, apex obtuse. Stamens 10–15, shorter than petals. Ovary pubescent apically; styles 2, free, not exceeding stamens. Fruit red, ellipsoid, 5–7 mm in diam., sparsely pubescent; pyrenes (1 or)2(or 3). Fl. Apr–Jun, fr. Sep–Oct.

• Rocky slopes, gullies, forests, shrubwoods, thickets; 1600–3400 m. Anhui, Gansu, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang.

51. *Cotoneaster langei* G. Klotz, Wiss. Z. Friedrich-Schiller- Univ. Jena, Math.-Naturwiss. Reihe 21: 1000. 1972.

中甸栒子 zhong dian xun zi

Shrubs deciduous or semievergreen, erect or partly prostrate, to 1 m tall. Branchlets brown or purplish brown to blackish brown, terete, initially yellow strigose, glabrous when old. Petiole 1–2 mm, densely strigose-villous; stipules partly persistent, subulate, 1–2 mm, membranous; leaf blade dark green adaxially, broadly ovate or suborbicular, 7–14 × 6–13 mm, subleathery, abaxially initially densely strigose-villous, glabrate, adaxially shiny, initially yellowish villous, glabrescent, lateral veins 3–5 pairs, slightly impressed adaxially, base rounded or broadly cuneate, apex obtuse and mucronate, rarely emarginate or acute. Inflorescences 1-flowered. Pedicel very short or indistinct, strigose-villous. Flower 5–7 mm in diam. Hypanthium campanulate, abaxially strigose-villous. Sepals broadly triangular, 1–2 × 1.5–2.5 mm, apex acute or ± obtuse. Petals erect, pink, suborbicular, base shortly clawed, apex obtuse. Stamens 10–12. Styles 2, free. Fruit dark red, ovoid-globose, 8–9 mm in diam., sparsely strigose-villous; pyrenes 2, ovoid. Fl. May–Jun, fr. Aug–Sep.

• Thickets, coniferous forests, rocky slopes; 3000–3500 m. SW Sichuan, NW Yunnan.

Further study is necessary to determine the identity of *Cotoneaster ganghobaensis* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

52. *Cotoneaster chengkangensis* T. T. Yu, Acta Phytotax. Sin. 8: 220. 1963.

镇康栒子 zhen kang xun zi

Cotoneaster strigosus G. Klotz.

Shrubs deciduous, to 2 m tall. Branchlets grayish brown to grayish black, terete, initially densely yellow strigose, glabrous when old, inconspicuously verruculose. Petiole 1–3 mm, pubescent; stipules linear-lanceolate, nearly as long as or slightly longer than petioles, membranous, puberulous; leaf blade ovate or broadly elliptic to suborbicular, (0.8–)1–2 × 0.7–1.5 cm, both surfaces appressed pilose, more densely so adaxially, base broadly cuneate to subrounded, apex acute, sometimes mucronate. Inflorescences 2- or 3-flowered; bracts linear or lanceolate, nearly as long as or slightly longer than pedicels. Flowers 6–7 mm in diam. Pedicel 3–4 mm, pilose. Hypanthium campanulate, abaxially puberulous. Sepals triangular, 1–1.5 × 1.5–2 mm, apex acute. Petals erect, pinkish, ovate or obovate, 3–4 × 2–3 mm, base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pilose apically; styles 4 or 5, free, somewhat not exceeding stamens. Fruit usually nodding, red, ellipsoid, 8–9 × 5–7 mm, shortly puberulous, glabrous when old; pyrenes usually 3. Fl. May–Jun, fr. Sep–Oct.

• Rocky places, alongside ditches; 2300–3400 m. W Yunnan.

53. *Cotoneaster nitens* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 156. 1912.

光泽栒子 guang ze xun zi

Shrubs deciduous, 2–4 m tall, much branched. Branchlets grayish brown to grayish black, terete, initially strigose, glabrous when old. Petiole 2–3 mm, villous, sometimes subglabrous; stipules partly persistent, linear, pubescent; leaf blade ovate or elliptic, 1–2 × 0.7–1.5 cm, abaxially initially villous, subglabrous when old, adaxially lustrous, glabrous, base rounded or broadly cuneate, apex obtuse, rarely acute, sometimes mucronate or emarginate. Corymbs 1–2 cm, 2- or 3(–8)-flowered; rachis and pedicels villous; bracts linear, pubescent. Pedicel 2–4 mm. Flowers 7–8 mm in diam. Hypanthium sparsely villous abaxially. Sepals triangular, 1–2 × 1.5–2.5 mm, shorter than petals, apex acute or ± obtuse. Petals pinkish, suborbicular or broadly obovate, 4–4.5 × 3–4 mm, apex obtuse. Stamens 10–12, shorter than petals. Ovary pubescent apically; styles often 2, rarely 3, free, not exceeding stamens. Fruit purplish black, ellipsoid, 6–8 mm in diam., shiny, glabrous; pyrenes 1 or 2. Fl. May–Jun, fr. Sep–Oct. 2n = 68*.

• Slopes, river banks, mixed forests; 1900–3000 m. W Sichuan.

54. *Cotoneaster harrismithii* Flinck & Hylmö, Bot. Not. 115: 29. 1962.

丹巴栒子 dan ba xun zi

Shrubs deciduous, 1–2 m tall. Branchlets sometimes nod-

ding, reddish brown when old, terete, initially grayish yellow strigose-villous, glabrous when old. Petiole 2–3 mm, strigose-villous; stipules subulate, 2–5 mm, pilose; leaf blade elliptic to ovate-elliptic, (0.7–)1.5–2 cm × 4–11 mm, lateral veins 3 or 4 pairs, slightly raised abaxially, both surfaces appressed strigose-villous, more densely so abaxially, glabrescent, base cuneate or somewhat rounded, apex acute to acuminate. Corymbs (2 or)3 (or 4)-flowered; rachis and pedicels villous; bracts subulate, sparsely villous. Pedicel 1–3 mm. Flowers 4–5 mm in diam. Hypanthium campanulate, abaxially villous. Sepals triangular, apex acute. Petals erect, pink or brownish red with white margin, suborbicular, 2–3 × 1.5–2 mm, base cuneate, apex incurved. Stamens (10–)12(–14), 1.5–2 mm; filaments equal in length; anthers yellowish white or pink. Styles 2 or 3, free, 1–2 mm. Fruit brownish black or black, ovoid or subglobose, 6–7 × 4–5 mm; pyrenes 2 or 3. Fl. Apr–May, fr. Aug–Sep.

• Slopes, thickets; 2300–2900 m. W Sichuan, SE Xizang.

55. *Cotoneaster nitidus* Jacques, J. Soc. Imp. Centr. Hort. 5: 516. 1859.

两列栒子 liang lie xun zi

Shrubs deciduous or semievergreen, erect, to 2.5 m tall. Branchlets ± dichotomously arranged, grayish brown when old, terete, initially densely yellow strigose, gradually glabrescent. Petiole 1–3 mm, villous; stipules persistent, lanceolate, 2–4 mm, pilose; leaf blade broadly ovate or broadly obovate, (0.4–)0.8–1.5(–2.5) × (0.5–)0.7–1.3(–1.8) cm, midvein raised abaxially and impressed adaxially, both surfaces appressed villous, more densely so adaxially, base rounded or broadly cuneate, apex acute and mucronate, rarely obtuse. Inflorescences 1-flowered. Pedicel 1–2 mm. Flower 5–7 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals broadly triangular, 1–2 × 2–3 mm, apex ± acute or obtuse. Petals erect, white or stained reddish, ovate or suborbicular, 3–4 mm in diam., apex obtuse. Stamens 20, shorter than petals. Ovary pubescent apically; styles (2 or)3(or 4), free, somewhat not exceeding stamens. Fruit nodding, red, broadly obovoid, 7–8 mm in diam., shortly puberulous; pyrenes (2 or)3(or 4). Fl. Jun–Jul, fr. Sep–Oct.

Thickets, forests, grassy slopes, mountain regions and valleys; 1600–4000 m. Sichuan, Xizang, Yunnan [Bhutan, NE India, N Myanmar, Nepal, Sikkim].

- 1a. Leaf blade 4–7 × 5–6 mm, apex obtuse or emarginate 55c. var. *parvifolius*
- 1b. Leaf blade 8–15(–25) × 7–13(–18) mm, apex acute.
 - 2a. Leaf blade 8–15(–20) × 7–13(–15) mm, apex acute and abruptly mucronate, rarely obtuse 55a. var. *nitidus*
 - 2b. Leaf blade 12–25 × 12–18 mm, apex acute and shortly mucronate 55b. var. *duthieanus*

55a. *Cotoneaster nitidus* var. *nitidus*

两列栒子(原变种) liang lie xun zi (yuan bian zhong)

Cotoneaster distichus Lange; *C. rupestris* Charlton.

Leaf blade 0.8–1.5(–2) × 0.7–1.3(–1.5) cm, apex acute and

abruptly mucronate, rarely obtuse.

Thickets, forests, grassy slopes, mountain valleys; 1600–4000 m. Sichuan, Xizang, Yunnan [Bhutan, NE India, N Myanmar, Nepal, Sikkim].

55b. *Cotoneaster nitidus* var. *duthieanus* (C. K. Schneider) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 167. 1974.

大叶两列栒子 da ye liang lie xun zi

Cotoneaster distichus Lange var. *duthieanus* C. K. Schneider, Ill. Handb. Laubholz. 1: 745. 1906; *C. duthieanus* (C. K. Schneider) G. Klotz; *C. forrestii* G. Klotz.

Leaf blade 1.2–2.5 × 1.2–1.8 cm, apex acute and shortly mucronate.

Mountain regions; 2500–4000 m. NW Yunnan [N Myanmar].

Further study is necessary to determine the identities of *Cotoneaster cuspidatus* Marquand ex J. Fryer & B. Hylmø and *C. marquandii* G. Klotz, which might be synonymous with this taxon.

55c. *Cotoneaster nitidus* var. *parvifolius* (T. T. Yu) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 167. 1974.

小叶两列栒子 xiao ye liang lie xun zi

Cotoneaster distichus Lange var. *parvifolius* T. T. Yu, Bull. Brit. Mus. (Nat. Hist.) Bot. 1: 129. 1954; *C. cavei* G. Klotz; *C. cordifolius* G. Klotz; *C. nitidus* subsp. *cavei* (G. Klotz) H. Ohashi.

Leaf blade 4–7 × 5–6 mm, apex obtuse or emarginate.

High mountain regions; 2700–3200 m. NW Yunnan [N Myanmar].

Further study is necessary to determine the identity of *Cotoneaster salwinensis* G. Klotz, which might be synonymous with this taxon.

56. *Cotoneaster taylorii* T. T. Yu, Bull. Brit. Mus. (Nat. Hist.) Bot. 1: 129. 1954.

藏南栒子 zang nan xun zi

Cotoneaster nitidus Jacquin subsp. *taylorii* (T. T. Yu) H. Ohashi.

Shrubs or small trees, deciduous, 2–3 m tall. Branchlets grayish brown when old, terete, initially densely brownish yellow strigose, glabrous when old. Petiole 2–3 mm, brownish yellow pilose; stipules lanceolate, 1–2 mm, membranous, brownish yellow pilose; leaf blade suborbicular or broadly ovate, 1–1.2 cm × 9–10 mm, adaxially shiny, veins inconspicuously raised abaxially and slightly impressed adaxially, both surfaces initially hirtellous, glabrous when old, base rounded, rarely broadly cuneate, apex obtuse or acute. Inflorescences 2- or 3-flowered; bracts lanceolate, 1–2 mm, membranous. Pedicel 3–5 mm, hirsute. Hypanthium campanulate, abaxially usually glabrous. Sepals broadly triangular, puberulous only along margin, apex obtuse. Petals erect, dark red with white margin, suborbicular, 3–3.5 mm in diam., base shortly clawed, apex obtuse. Stamens ca. 10, shorter than petals, glabrous. Ovary with dense, white hairs at apex; styles 2, free, not exceeding stamens. Fruit red, obovoid; pyrenes 1 or 2. Fl. May–Jun, fr. Jul–Aug.

• Stream sides, gully forests, thickets, river valleys; 3300–4200 m. E Xizang.

57. *Cotoneaster verruculosus* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 272. 1912.

疣枝栒子 you zhi xun zi

Cotoneaster distichus Lange var. *verruculosus* (Diels) T. T. Yu; *C. improvisus* G. Klotz.

Shrubs deciduous or semievergreen, erect, 0.6–2 m tall. Branchlets initially dark reddish brown to grayish brown, dark gray when old, terete, initially densely yellow strigose, glabrate, conspicuously verruculose when old. Petiole 2–5 mm, pubescent; stipules persistent, lanceolate, 2–6 mm, pubescent; leaf blade suborbicular or broadly ovate to broadly obovate, 0.7–1.4 cm × 6–12 mm, both surfaces appressed pilose, glabrescent, abaxially subglabrous, base broadly cuneate or rounded, apex emarginate or partly mucronulate. Inflorescences usually 1-flowered. Flowers 7–8 mm in diam., nearly sessile. Hypanthium glabrous abaxially. Sepals ovate-triangular, 1.5–2.5 mm and ca. as broad, apex ± obtuse. Petals erect, pink, suborbicular, 4–4.5 mm in diam. Stamens 20, shorter than petals. Ovary pubescent apically; styles 2, free, not exceeding stamens. Fruit red, globose, 7–8 mm in diam.; pyrenes often 2. Fl. May–Jun, fr. Sep–Oct.

Mixed forests on dry slopes, grasslands, fields, roadsides; 2800–3600 m. Sichuan, Xizang, Yunnan [Bhutan, N India, Myanmar, Nepal, Sikkim].

58. *Cotoneaster apiculatus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 156. 1912.

细尖栒子 *xi jian xun zi*

Shrubs deciduous, erect, 1.5–2 m tall, irregularly branched. Branchlets dark grayish red to grayish brown, terete, initially strigose, glabrescent. Petiole 1–3 mm, initially pubescent, later glabrous; stipules caducous or partly persistent, linear-lanceolate, 2–3 mm, membranous; leaf blade suborbicular or orbicular-ovate, rarely broadly obovate, 6–15 × 5–13 mm, midvein and 2 pairs of lateral veins somewhat raised abaxially and slightly impressed adaxially, abaxially initially appressed strigose-pilose along veins, glabrate, adaxially lustrous, glabrous, base broadly cuneate or rounded, apex apiculate, rarely emarginate. Inflorescences 1-flowered. Pedicel short. Hypanthium glabrous or subglabrous abaxially. Sepals triangular, 1.5–2 mm and ca. as broad, apex shortly acuminate. Petals erect, pinkish, suborbicular, base shortly clawed, apex obtuse. Fruit solitary, erect, red, subglobose, 7–8 mm in diam.; pyrenes (2 or)3. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Roadsides on slopes, forests, upland thickets, forest margins, open places, ditch sides, rocky cliffs; 1500–3300 m. Gansu, Hubei, Shaanxi, Sichuan, Yunnan.

Further study is necessary to determine the identity of *Cotoneaster sichuanensis* G. Klotz, which might be synonymous with this taxon.

59. *Cotoneaster sanguineus* T. T. Yu, Bull. Brit. Mus. (Nat. Hist.) Bot. 1: 130. 1954.

血色栒子 *xue se xun zi*

Shrubs deciduous, 2–3 m tall, much branched. Branchlets grayish brown or grayish black when old, terete, initially yellowish strigose, gradually glabrescent. Petiole 3–6 mm, pilose; stipules lanceolate, 2–4 mm, membranous, puberulous; leaf blade ovate or elliptic-ovate, 1–2 cm × 7–12 mm, lateral veins 4 or 5 pairs, somewhat raised abaxially and slightly impressed adaxially, abaxially pilose, adaxially shiny, yellowish pilose, glabrous when old, base broadly cuneate or rounded, apex acute, rarely obtuse. Inflorescences usually 1-flowered; bracts lanceolate, somewhat longer than pedicels. Flower sessile, to 1 cm in diam. Hypanthium red, campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 × 2–3 mm, apex acute or obtuse. Petals erect or spreading, red, broadly obovate, 4–5 mm and ca. as broad, glabrous, base shortly broadly clawed, apex obtuse. Stamens 10, somewhat shorter than petals. Ovary yellow pubescent apically; styles 2, free, not exceeding stamens. Fruit red, subglobose; pyrenes 2. Fl. Jun–Jul.

Slopes, gullies, thickets, rocks, forests; 3200–4100 m. SE Xizang, NW Yunnan [Bhutan, NE India, Nepal].

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