

ELAEAGNACEAE

胡颓子科 hu tui zi ke

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Trees or shrubs, deciduous or evergreen; most parts with distinctive silvery or brownish peltate scales and/or stellate hairs, sometimes branches spine-tipped. Leaves alternate, opposite, or whorled; stipules absent; petiole usually present, sometimes short; leaf blade often leathery, simple, margin entire or subentire, abaxially densely stellate-hairy or peltate-scaly, pinnately veined. Flowers solitary or in clusters or short racemes, actinomorphic, bisexual, or unisexual (plants dioecious). Calyx in bisexual and female flowers tubular, 2–6(–8)-lobed, male flowers of *Hippophaë* of 2 membranous sepals. Petals absent. Stamens 4–8, free, adnate to calyx tube, in male flowers 2 × as many as the lobes, in bisexual flowers as many as the lobes and alternate with them. Ovary superior but tightly enclosed in differentiated basal part of calyx and apparently inferior, 1-loculed; style elongate, stigma lateral. Ovule 1, basal, anatropous. Fruit drupelike, indehiscent, enclosed in base of calyx tube and containing a single seed.

Three genera and ca. 90 species: N temperate and tropical regions; two genera and 74 species (59 endemic) in China.

The fruits of many members of this family are edible, and some species of both *Elaeagnus* and *Hippophaë* are widely utilized and sometimes cultivated as fruit trees. They are a particularly good source of Vitamin C. Several species are also grown as ornamental garden shrubs. The roots are able to fix atmospheric nitrogen making it possible for plants to grow well on very poor soils. For this reason, some species, most notably *Elaeagnus angustifolia*, have been used for land reclamation.

Chang Che-yung. 1983. Elaeagnaceae. In: Fang Wen-pei & Chang Che-yung, eds., Fl. Reipubl. Popularis Sin. 52(2): 1–66.

- 1a. Flowers bisexual; calyx 4-lobed; stone 8-ribbed; leaves always alternate 1. *Elaeagnus*
- 1b. Flowers unisexual (plants dioecious); calyx minutely 2-lobed; stone with longitudinal groove on one side; leaves alternate, opposite, or whorled 2. *Hippophaë*

1. ELAEAGNUS Linnaeus, Sp. Pl. 1: 121. 1753.

胡颓子属 hu tui zi shu

Oleaster Heister ex Fabricius.

Shrubs, sometimes climbing, or small trees, deciduous or evergreen, sometimes spiny. Leaves alternate, petiolate, blade margin usually entire. Flowers bisexual, clustered on short axillary shoots, sometimes solitary. Calyx tubular, 4-lobed, constricted above ovary and breaking at constriction as fruit develops; lobes usually spreading, deciduous, white or yellow inside. Stamens 4, inserted in mouth of calyx tube, alternate with lobes. Style linear, not exerted. Drupe globose or ellipsoid, rarely longitudinally winged (*E. mollis*); stone usually 8-ribbed, with a large straight embryo.

About 90 species: Asia, S Europe, North America; 67 species (55 endemic) in China.

Many taxa are separated only by quantitative characters, and better information on population variation is likely to lead to a significant reduction in the number of species recognized. Indeed, recent studies (Du, Fl. Yunnan. 12: 749–776. 2006) suggest that some species of *Elaeagnus* should be combined.

Species no. 35, *Elaeagnus xingwenensis*, was described from fruiting material and could not be included in this key. There is an unsubstantiated record of *E. murakamiana* Makino from China and Korea, but current Japanese floras treat this species as endemic to Japan, so it seems best to exclude it from this treatment.

- 1a. Deciduous or semievergreen trees or shrubs; leaf blade papery or membranous, never leathery; flowering in spring or summer, fruiting in summer and autumn.
- 2a. Trees or large shrubs; fruit not juicy.
- 3a. Fruit subglobose or broadly ellipsoid, conspicuously 8-winged; leaf blade ovate or ovate-elliptic, abaxially densely hairy; floral disk inconspicuous 46. *E. mollis*
- 3b. Fruit ovoid or ellipsoid, not winged; leaf blade narrowly lanceolate or elliptic, glabrous or sometime stellate; floral disk tubular, conspicuous.
- 4a. Floral disk usually glabrous; fruit 12–26 mm, ellipsoid, pink; branches with spines few or absent 44. *E. angustifolia*
- 4b. Floral disk pubescent at top; fruit 8–10 mm, ovoid or subglobose, cream-yellow or orange-yellow; branches conspicuously spiny 45. *E. oxycarpa*
- 2b. Small shrubs; fruit juicy.
 - 5a. Leaves abaxially pubescent or pilose, lateral veins often adaxially impressed.
 - 6a. Flowers with stellate hairs.
 - 7a. Leaves abaxially with long-stalked stellate hairs; fruiting pedicel 8–25 mm.

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- 8a. Flowers in clusters of 5–7; calyx tube 6–6.5 mm, lobes ca. 3.5 mm, shorter than tube; fruiting pedicel 10–25 mm 47. *E. grijsii*
- 8b. Flowers in clusters of 1–3; calyx tube 4–4.5 mm, lobes ca. 5.5 mm, longer than tube; fruiting pedicel 8–10 mm 50. *E. jingdongensis*
- 7b. Leaves abaxially with ± sessile stellate hairs.
- 9a. Semievergreen shrubs, some leaves persistent in winter; lateral veins 4 or 5 per side of midrib; fruiting pedicel 1–5 mm 49. *E. stellipila*
- 9b. Deciduous shrubs, leafless in winter; lateral veins 6–8 per side of midrib; fruiting pedicel 30–40 mm 56. *E. courtoisii*
- 6b. Flowers with peltate scales only, without stellate hairs.
- 10a. Young branches with stellate hairs, these often long-stipitate.
- 11a. Calyx tube ca. 9.5 mm; young branches with dense pale to dark brown stellate hairs; leaf blade 3.5–6 cm 55. *E. jiangxiensis*
- 11b. Calyx tube ca. 5 mm; young branches with rust-colored stellate hairs; leaf blade 6–9 cm 48. *E. calcarea*
- 10b. Young branches with appressed scales only.
- 12a. New leaves produced in both spring and autumn; calyx tube funnellform, 5–6 mm; young branches with yellowish white scales 51. *E. argyi*
- 12b. New leaves produced only in spring; calyx tube campanulate or cup-shaped, 3–5 mm; young branches with yellowish brown to dark brown or rust-colored scales.
- 13a. Pedicels 3–5 mm; calyx tube 3–3.5 mm 52. *E. micrantha*
- 13b. Pedicels ca. 1 mm; calyx tube 4–5 mm.
- 14a. Leaf blade leathery, lanceolate-elliptic, 7–8 × ca. 2.5 cm, lateral veins 7–10 pairs; style pubescent 53. *E. bambusetorum*
- 14b. Leaf blade papery, broadly elliptic, 5.5–7 × 2.6–3.8 cm, lateral veins 5–7 pairs; style glabrous 54. *E. guizhouensis*
- 5b. Leaves abaxially with appressed scales only, lateral veins adaxially not impressed above.
- 15a. Material in flower.
- 16a. Style stellate hairy.
- 17a. Young branches with silvery scales; calyx tube 5–10 mm.
- 18a. Calyx tube 5–7 mm 57. *E. umbellata*
- 18b. Calyx tube 8–10 mm 58. *E. magna*
- 17b. Young branches with brown scales; calyx tube 4–6 mm.
- 19a. Pedicel ca. 3 mm; style sparsely stellate hairy, sometimes glabrous 60. *E. wushanensis*
- 19b. Pedicel 5–8 mm; style densely stellate hairy 62. *E. angustata*
- 16b. Style glabrous.
- 20a. Calyx tube 3–4.5 mm.
- 21a. Petiole 3–5 mm; leaf blade 2–5 × 1–2.5 cm 63. *E. tarokoensis*
- 21b. Petiole 6–11 mm; leaf blade 5–12 × 4–6 cm 66. *E. triflora*
- 20b. Calyx tube 5–10 mm.
- 22a. Petiole 8–13 mm; leaf blade leathery.
- 23a. Anthers 2.2–2.5 mm; leaf apex obtuse to rounded 64. *E. formosensis*
- 23b. Anthers 1.4–1.5 mm; leaf apex acute 65. *E. grandifolia*
- 22b. Petiole 3–8 mm; leaf blade papery or membranous.
- 24a. Leaf blade adaxially with stellate hairs when young 61. *E. multiflora*
- 24b. Leaf blade adaxially with scales only.
- 25a. Flowers often 5–7 in axillary clusters or along very short shoots; pedicel very short to ± absent 59. *E. nanchuanensis*
- 25b. Flowers 1–3 in axils of new leaves; pedicel ca. 3 mm 60. *E. wushanensis*
- 15b. Material in fruit.
- 26a. Fruit 5–10 mm.
- 27a. Fruit broadly ellipsoid to nearly globose, orange-pink, longer than its pedicel 63. *E. tarokoensis*
- 27b. Fruit subglobose, red, shorter than its pedicel 57. *E. umbellata*
- 26b. Fruit 12–20 mm.
- 28a. Fruiting pedicel erect, 3–15 mm.
- 29a. Young branches, flowers, and fruit with silvery scales 58. *E. magna*
- 29b. Young branches, flowers, and fruit with ferruginous or brown scales.
- 30a. Branches thick, smooth; fruiting pedicel 3–9 mm 59. *E. nanchuanensis*
- 30b. Branches slender, rough; fruiting pedicel 8–16 mm 60. *E. wushanensis*
- 28b. Fruiting pedicel curved downward, (10–)15–45 mm.

- 31a. Young stems with rust-colored or dark brown scales; petiole 3–8 mm; plants erect.
- 32a. Leaf blade elliptic or ovate to obovate-oblong, 2–5 cm wide 61. *E. multiflora*
- 32b. Leaf blade at first elliptic, later in season lanceolate or oblong-lanceolate, 1.2–2.2 cm wide 62. *E. angustata*
- 31b. Young stems with silvery brown scales; petiole 6–13 mm; plants scandent.
- 33a. Leaf blade apex obtuse 66. *E. triflora*
- 33b. Leaf blade apex acute.
- 34a. Leaf blade broadly elliptic to elliptic, leathery; fruit 1.6–1.8 cm 65. *E. grandifolia*
- 34b. Leaf blade ovate, papery; fruit 1.8–2 cm 64. *E. formosensis*
- 1b. Evergreen trees or shrubs; leaf blade leathery or papery, rarely membranous; flowering in autumn or winter, fruiting in spring and summer (key mostly based on vegetative and floral characters as the fruit of many species are not recorded; *E. davidii* was described in the protologue as deciduous but has leathery, *Buxus*-like leaves and seems more likely to belong here).
- 35a. Calyx tube 4.5–7 mm wide; style always without hairs.
- 36a. Calyx lobes 2–4 mm; filaments ca. 0.5 mm.
- 37a. Erect shrub; leaf blade papery; style glabrous; calyx tube campanulate, lobes apically incurved, inside with scales and hairs 3. *E. luxiensis*
- 37b. Climbing shrub; leaf blade leathery; style with scales only; calyx tube funnelform, lobes erect, inside pubescent 17. *E. thunbergii*
- 36b. Calyx lobes (4–)5–7 mm; filaments 1.5–3 mm.
- 38a. Erect shrub; stamen filaments 2–3 mm.
- 39a. Leaf blade elliptic or oblong, papery; flowers 1–5 on slender axillary shoot; calyx tube 8–9 mm; stigma only slightly curved 1. *E. macrantha*
- 39b. Leaf blade usually obovate, leathery or nearly so; flowers 4–6 in dense axillary cluster; calyx tube 6–7.5 mm; stigma tightly coiled 2. *E. obovatifolia*
- 38b. Climbing shrub; stamen filaments 1.5–2 mm.
- 40a. Stamen filaments ca. 2 mm, longer than anthers 4. *E. griffithii*
- 40b. Stamen filaments ca. 1.5 mm, shorter than or ca. as long as anthers.
- 41a. Pedicel 4–7 mm; calyx tube 8–9 mm 5. *E. pingnanensis*
- 41b. Pedicel 7–10 mm; calyx tube 10–11 mm 6. *E. loureiroi*
- 35b. Calyx tube 2–4 mm wide; style sometimes with stellate hairs.
- 42a. Calyx tube 4-angled or cup-shaped, lobes usually ca. as long as or longer than tube, wrinkled at base.
- 43a. Flowers sessile; inflorescence shorter than petioles; calyx lobes ca. 1/2 as long as tube 14. *E. conferta*
- 43b. Flowers pedicellate; inflorescence longer than petioles; calyx lobes ca. as long as or longer than tube.
- 44a. Calyx tube cupular-campanulate, faintly 4-angled; leaf blade papery or thinly leathery, veins adaxially inconspicuous.
- 45a. Calyx tube 2–2.5 mm; leaf blade obovate, ovate, or suborbicular.
- 46a. Leaf blade obovate, 3–6 cm 13. *E. oldhamii*
- 46b. Leaf blade ovate or suborbicular, 2–2.5 cm 67. *E. ovata*
- 45b. Calyx tube 3–4 mm; leaf blade elliptic, narrowly elliptic, or lanceolate.
- 47a. Young branchlets with dense ferruginous scales; leaf blade elliptic, petiole ca. 6 mm; flowers yellowish brown 11. *E. tonkinensis*
- 47b. Young branchlets with dense yellowish white or light brown scales; leaf blade narrowly elliptic to lanceolate, petiole 3–4 mm; flowers silvery white 12. *E. schlechtendalii*
- 44b. Calyx tube conspicuously 4-angled; leaf blade leathery, veins adaxially conspicuous.
- 48a. Petiole robust, 10–18 mm; spines present; filaments ca. 2.4 mm 9. *E. obtusa*
- 48b. Petiole 3–10 mm; spines apparently absent; filaments 0.6–1 mm.
- 49a. Pedicel 1–2 mm; leaf blade dark brown when dried 10. *E. formosana*
- 49b. Pedicel 3–6 mm; leaf blade green when dried.
- 50a. Leaf blade widest ca. 1/2 way along, 5–9 cm, lateral veins abaxially prominent; style straight ... 7. *E. gonyanthes*
- 50b. Leaf blade widest less than 1/2 way along, (1–)3–6 cm, lateral veins abaxially inconspicuous; style bent 8. *E. geniculata*
- 42b. Calyx tube tubular, campanulate, or funnelform, not 4-angled or cup-shaped, lobes often shorter than tube, not wrinkled at base.
- 51a. Style glabrous.
- 52a. Leaves adaxially drying blackish; pedicel 0.5–1 mm, flower ± erect; calyx lobes ca. as long as tube 43. *E. yunnanensis*
- 52b. Leaves adaxially drying green or gray-green; pedicel (1–)2.5–12 mm; calyx lobes shorter than tube.
- 53a. Climbing shrub or vine.
- 54a. Calyx tube funnelform, 5–6 mm, lobes 2–3 mm 38. *E. glabra*

- 54b. Calyx tube tubular, 8–9 mm, lobes 4–6 mm.
 55a. Flowers brown, calyx lobes inside with only stellate hairs 36. *E. sarmentosa*
 55b. Flowers white, calyx lobes inside with both stellate hairs and white scales 37. *E. cinnamomifolia*
- 53b. Erect shrub, rarely divaricate.
 56a. Lateral veins at 50°–60° to midrib, veins adaxially conspicuous.
 57a. Branchlets spinelike; leaf blade thickly leathery, lateral veins 7–9 pairs 39. *E. pungens*
 57b. Branchlets not spiny; leaf blade papery or thinly leathery, lateral veins 5–7 pairs 40. *E. tutcheri*
 56b. Lateral veins at 45°–50° to midrib, veins adaxially inconspicuous.
 58a. Flowers light white, calyx tube narrowly funnellform, 6–8 × 2–3 mm; leaf blade leathery, obovate-elliptic, abaxially silvery white 41. *E. henryi*
 58b. Flowers dark brown, calyx tube broadly funnellform-campanulate, ca. 5 × 4 mm; leaf blade papery, elliptic to elliptic-lanceolate, abaxially grayish brown 42. *E. difficilis*
- 51b. Style with stellate hairs.
 59a. Calyx tube campanulate or broadly tubular, 4–5 mm.
 60a. Leaf blade broadly ovate or suborbicular, petiole 15–25 mm; calyx lobes ca. as long as tube; fruit with silvery scales 15. *E. macrophylla*
 60b. Leaf blade elliptic or lanceolate, petiole shorter than 15 mm; calyx lobes shorter than tube; fruit with silvery or brownish scales (unknown for *E. davidii*).
 61a. Leaf blade 1.7–2.5 × 0.9–1.1 cm 28. *E. davidii*
 61b. Leaf blade 2–8 × 1.3–4 cm.
 62a. Pedicels 1–2 mm; plant climbing; leaf blade thinly papery or membranous, base cuneate to rounded; petiole 8–18 mm 17. *E. thunbergii*
 62b. Pedicels 6–10 mm; plant erect, occasionally procumbent; leaf blade leathery or papery, base ± rounded; petiole 7–9 mm.
 63a. Flowers brown; leaf blade abaxially uniformly brown 20. *E. luoxiangensis*
 63b. Flowers white; leaf blade abaxially grayish white, sometimes speckled brown.
 64a. Leaf blade apex acuminate; style S-shaped 18. *E. wenshanensis*
 64b. Leaf blade apex rounded or obtuse; style straight or slightly curved.
 65a. Young branchlets whitish or pale brown scaly; flowers in clusters of 1–5, calyx tube ca. 4 mm; plants with spines 16. *E. pallidiflora*
 65b. Young branchlets rust-colored scaly; flowers in clusters of 5–7, calyx tube 5–6 mm; plants without spines 19. *E. taliensis*
- 59b. Calyx tube tubular or tubular-funnelform, 5–11 mm, white or brown.
 66a. Calyx tube funnellform or tubular-funnelform.
 67a. Young branchlets grayish yellow or light yellow; leaf blade oblong or oblong-elliptic, adaxially light green when dried 21. *E. lanpingensis*
 67b. Young branchlets ferruginous or dark brown; leaf blade elliptic or oblanceolate-oblong, adaxially brown when dried.
 68a. Leaf blade elliptic, adaxially with scales when young, lateral veins 5–7 pairs; flowers yellowish brown; calyx tube 6–7 mm.
 69a. Pedicel 5–8 mm; calyx lobes ca. 2 mm; style curved at apex 22. *E. pilostyla*
 69b. Pedicel 4–5 mm; calyx lobes ca. 3 mm; style straight 23. *E. xizangensis*
 68b. Leaf blade oblanceolate-elliptic, adaxially with stellate hairs when young, lateral veins 7–9 pairs; flowers ± white, calyx tube 4–5 mm.
 70a. Leaf blades uniformly oblanceolate-elliptic; petiole 6–8 mm; inside of calyx with scales only 24. *E. liuzhouensis*
 70b. Leaf blades varying from orbicular to lanceolate, often along same branch; petiole 3–5 mm; inside of calyx both stellate-pilose and scaly 25. *E. heterophylla*
- 66b. Calyx tube tubular.
 71a. Calyx tube 9–11 mm, lobes ca. 5 mm; leaf blade abaxially brown 26. *E. tubiflora*
 71b. Calyx tube 5–8 mm, lobes 1.5–4 mm; leaf blade abaxially often ± white.
 72a. Style coiled into a spiral 29. *E. retrostyla*
 72b. Style erect or curved, but not spiral.
 73a. Leaf blade narrowly lanceolate or narrowly elliptic; fruit 8–12 mm, scales dense, silvery 27. *E. bockii*
 73b. Leaf blade elliptic to broadly elliptic, or elliptic-lanceolate to lanceolate; fruit 12–16 mm, brown or rust-colored, rarely white (unknown for *E. taliensis* and *E. xichouensis*).
 74a. Flowers in clusters of 5–7; pedicel (4–)6–8(–10) mm; style densely hairy.
 75a. Petiole 12–15 mm; leaf blade elliptic or oblong-lanceolate 34. *E. delavayi*
 75b. Petiole 6–8 mm; leaf blade ovate or broadly elliptic 19. *E. taliensis*

- 74b. Flowers solitary or in clusters of 2–5; pedicel 2–5 mm; style glabrous or sparsely hairy.
 76a. Leaf blade with 8–12 lateral veins per side of midrib, base rounded 30. *E. lanceolata*
 76b. Leaf blade with 5–7 lateral veins per side of midrib.
 77a. Calyx lobes ovate-triangular, ca. 2.5 mm; young shoots with rust-colored scales 31. *E. viridis*
 77b. Calyx lobes narrowly triangular, ca. 4 mm; young shoots with grayish yellow or brown scales.
 78a. Leaf blade papery, 2–3 cm wide, adaxially brown when dried 32. *E. longiloba*
 78b. Leaf blade leathery, 4.5–5 cm wide, adaxially green when dried 33. *E. xichouensis*

1. *Elaeagnus macrantha* Rehder in Sargent, Pl. Wilson. 2: 416. 1915.

大花胡颓子 da hua hu tui zi

Shrubs, evergreen, erect, 2–3 m tall. Old branches glabrous; young branches brown scaly. Petiole 7–10 mm; leaf blade elliptic or oblong, 7–13 × 3.5–5 cm, papery, abaxially silvery scaly, brownish on veins when young, glabrous when mature, scales deeply finely divided, nearly hairlike, adaxially glabrous except for few brown scales along base of midrib when mature, base rounded or cuneate, margin slightly undulate, apex acute. Flowers 1–5 on slender short axillary shoot, axis white scaly. Pedicel 2–5 mm. Calyx white, outside densely silvery scaly, scales irregularly erose-lobed; tube broadly campanulate, 8–9 mm; lobes broadly triangular, 5–7 mm, inside with white stellate hairs/deeply divided scales. Filaments erect, ca. 3 mm; anthers oblong, ca. 1.5 mm. Style straight, glabrous; stigma small. Drupe oblong, ca. 2.3 × 1.1 cm, densely rust-colored scaly. Fl. Dec–Feb, fr. spring–summer.

- Dense forests; 700–1800 m. S Yunnan.

2. *Elaeagnus obovatifolia* D. Fang, Acta Phytotax. Sin. 38: 289. 2000.

弄化胡颓子 nong hua hu tui zi

Shrubs, evergreen, ca. 2 m tall. Spines absent; young branches with dense greenish brown scales. Petiole brownish green, 8–15 mm; leaf blade abaxially gray-green, adaxially drying greenish brown, narrowly obovate or obovate, rarely obovate-elliptic, 6–12.7 × 3.5–7.3 cm, leathery or nearly so, abaxially densely scaly, adaxially at first densely scaly, later glossy, lateral veins 5 or 6 per side of midrib, conspicuous on both surfaces, base broadly cuneate to obtuse, margin slightly revolute, apex acuminate. Flowers often 4–6 in axils of long shoots. Pedicel 4–7 mm. Calyx with dense gray-green and sparse brown scales, broadly campanulate, slightly 4-angled; tube 6–7.5 mm, abruptly constricted above ovary; lobes ovate-triangular or triangular, 5–5.5 × 4–4.5 mm, inside with dense silver or brown scales, base sparsely white pilose, apex acute. Filaments ca. as long or slightly longer than anthers; anthers oblong-elliptic, 2–2.5 mm. Style curved, sparsely stellate-pilose; stigma coiled, ca. 1.5 mm, apex acuminate. Fruit not seen. Fl. Jan.

- Thickets on rocky hills; ca. 1000 m. Guangxi (Napo).

Elaeagnus obovatifolia is known to us only from the protologue.

3. *Elaeagnus luxiensis* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 105. 1980.

潞西胡颓子 lu xi hu tui zi

Shrubs, evergreen, erect, 2–3 m tall. Branches thick, spines

absent; old branches black, without scales; young branches densely fine scaly. Petiole rust-colored, 8–10 mm; leaf blade elliptic or ovate-elliptic, 6–11 × 2.5–4.2 cm, papery or sub-leathery, abaxially with overlapping scales; scales mostly gray, some brown, umbonate, margin shallowly erose-lacerate; adaxially with dense brown scales when young, glabrous when mature, scales irregularly lobed/divided, lateral veins 5–8 per side of midrib, conspicuous abaxially, base rounded, rarely cuneate, margin very narrowly incurved, apex acuminate. Flowers often 2–5 on short, slender, axillary shoots. Pedicel 4–6 mm. Calyx light yellow or greenish yellow, outside with overlapping scales, mostly white, a few brown; tube broadly campanulate, 8–9 mm, abruptly constricted above ovary, inside glabrous except for lobes; lobes ovate-triangular, 4–4.5 mm, with deeply divided white scales, inside sparsely brown scaly. Filaments very short, ca. 0.5 mm; anthers oblong, ca. 1.5 mm. Style erect, glabrous. Drupe ca. 1.5 × 0.7 cm, densely brown scaly. Fl. Dec–Feb, fr. Apr–May.

- Dense forests; 1000–1800 m. SW Yunnan.

4. *Elaeagnus griffithii* Servettaz, Bull. Herb. Boissier, sér. 2, 8: 385. 1908.

钟花胡颓子 zhong hua hu tui zi

Shrubs, evergreen, divaricate or climbing, 2–4 m tall. Spines absent; young branches densely ferruginous- or brown scaly. Petiole 9–14 mm; leaf blade abaxially ferruginous when young, gray-green and glossy when mature, adaxially drying dull green, elliptic to broadly elliptic, 8–14 × 3–7 cm, membranous, thinly papery, or leathery, abaxially scales ± contiguous at maturity, mostly with brown centers, margin subentire, adaxially with brown scales when young, glabrous when mature, lateral veins 6–8 per side of midrib, raised on both surfaces, conspicuous abaxially, slender adaxially, base rounded or subrounded, margin revolute, apex acuminate to acute. Flowers nodding, 1–9 in axils of mature leaves. Pedicel 3–5 mm, slender, to 1.8 cm in fruit. Flowers light white, outside silvery scaly. Calyx tube broadly campanulate, 6–7 mm, abruptly constricted above ovary; lobes ovate-triangular, 3–6 mm, inside densely stellate-hairy to stellate-tomentose with sparse brown scales. Filaments 2–2.5 mm, expanded at base; anthers ca. 1.5 mm. Style erect, glabrous. Drupe ellipsoid, ca. 1.5 × 0.5 cm, rust-colored scaly. Fl. Nov–Feb, fr. Apr–May.

Dense forests, open woodlands; 200–2800 m. Guangxi, ?Sichuan, Yunnan [Bangladesh].

The record from Sichuan is possibly based on a misidentification and cannot be placed to variety.

- 1a. Inflorescence 5–9-flowered 4c. var. *multiflora*
 1b. Inflorescence 1–3-flowered.

- 2a. Leaf blade membranous or thinly papery, 3–6 cm wide 4a. var. *griffithii*
 2b. Leaf blade leathery, ca. 7 cm wide 4b. var. *pauciflora*

4a. *Elaeagnus griffithii* var. *griffithii*

钟花胡颓子(原变种) zhong hua hu tui zi (yuan bian zhong)

Leaf blade 8–12.5 × 3–6 cm, membranous or thinly papery. Inflorescence 1–3-flowered. Calyx lobes 5–6 mm, inside densely stellate-hairy. Filaments ca. 2 mm. Fl. Nov–Feb, fr. Apr–May.

Dense forests; 1600–2800 m. Yunnan [Bangladesh].

4b. *Elaeagnus griffithii* var. *pauciflora* C. Y. Chang, Acta Phytotax. Sin. 23: 379. 1985.

少花胡颓子 shao hua hu tui zi

Leaf blade 9–14 × ca. 7 cm, leathery. Inflorescence often 1-flowered. Calyx lobes inside densely yellow stellate-tomentose with sparse brown scales. Filaments ca. 2.5 mm.

• 1300–1400(–1600) m. Guangxi (Napo), Yunnan (Malipo).

This and the following variety are known to us only from their protologues.

4c. *Elaeagnus griffithii* var. *multiflora* C. Y. Chang, J. Sichuan Univ., Nat. Sci. Ed. 1984(4): 93. 1984.

那坡胡颓子 na po hu tui zi

Inflorescence umbel-like, 5–9-flowered; rachis ca. 3 mm. Calyx lobes 3–4 mm.

• Open woodlands; 200–1000 m. Guangxi (Napo).

5. *Elaeagnus pingnanensis* C. Y. Chang, J. Sichuan Univ., Nat. Sci. Ed. 1984(4): 91. 1984.

平南胡颓子 ping nan hu tui zi

Shrubs, evergreen, climbing. Spines absent; branches curved, grayish black, scabrid; young branches brown, obscurely 3-sided, densely scaly; scars of bud scales often obvious. Petiole reddish brown, 1–1.5 cm; leaf blade abaxially drying greenish or brown, adaxially dark green but drying brownish green, ovate or elliptic, 6–9 × 3–5 cm, thickly leathery, adaxially glossy, at first with brown scales, glabrescent, lateral veins 6–8 per side of midrib, at 60° to it, conspicuous on both surfaces, base rounded or broadly cuneate, margin slightly revolute or undulate, apex bluntly acute with triangular mucro. Flowers 3–7 on axillary shoots 2–5 mm. Pedicel robust, 4–7 mm. Calyx yellowish, outside with dense silvery scales and sparser reddish brown scales; tube broadly campanulate, slightly 4-angled when dried, 8–9 mm, 5–6 mm in diam., abruptly constricted above ovary, slightly constricted below lobes, inside glabrous; lobes broadly triangular, 4–5 mm, inside with white stellate hairs/deeply divided scales, apex bluntly acuminate. Filaments ca. 1.5 mm; anthers oblong, ca. 1.5 mm. Style erect; stigma slightly curved. Fruit not seen.

• Streamsides; ca. 500 m. Guangxi (Pingnan).

Elaeagnus pingnanensis is possibly just a smaller-flowered variant of the following species.

6. *Elaeagnus loureiroi* Champion ex Bentham, Hooker's J. Bot. Kew Gard. Misc. 5: 196. 1853 [“*loureiri*”].

鸡柏紫藤 ji bai zi teng

Shrubs, evergreen, erect or climbing, 2–3(–10+) m tall. Branches slender, spines usually absent; old branches nearly black, glabrous; young branches with overlapping rust-colored scales. Petiole brown, 8–15 mm; leaf blade elliptic, ovate-elliptic, or lanceolate, 5–10 × 2–4.5 cm, papery or thinly leathery, abaxially with contiguous scales when young, varying from silvery with pale brown center to uniformly brown, later with scattered brown scales, adaxially with scattered lacerate scales, rapidly glabrescent, minutely punctate, lateral veins 5–7 per side of midrib, slightly conspicuous on both surfaces, base rounded, rarely cuneate, margin very shallowly crenate and revolute, apex acuminate or acute. Flowers often several in axil. Pedicel 7–10 mm. Flowers with overlapping brown or rust-colored scales. Calyx tube campanulate, 10–11 mm, abruptly constricted above ovary, not constricted at base of lobes; lobes triangular, 5–7 mm, inside sparsely white pilose and brown scaly, apex acuminate. Filaments ca. 1.5 mm; anthers oblong, ca. 2 mm. Style curved, ca. 3 mm, glabrous. Drupe ellipsoid, 1.5–2.2 cm. Fl. Oct–Dec, fr. Apr–May.

• Montane forests; 500–2100 m. Guangdong, Guangxi, Jiangxi, Yunnan.

7. *Elaeagnus gonyanthes* Bentham, Hooker's J. Bot. Kew Gard. Misc. 5: 196. 1853.

角花胡颓子 jiao hua hu tui zi

Shrubs, evergreen, climbing, ca. 4 m or more tall. Branches slender, spines absent; old branches glabrous, glossy; young branches with dense brownish red scales. Petiole brown, 4–8 mm; leaf blade elliptic or oblong-elliptic, 5–9 × 1.2–5 cm, leathery, both surfaces scaly, adaxially glabrescent, lateral veins 7–10 per side of midrib, raised on both surfaces, inconspicuous abaxially, distinct adaxially, base rounded, margin very narrowly revolute, apex obtuse. Flowers solitary. Pedicel 3–6 mm. Flowers white, outside silvery scaly. Calyx tube broadly campanulate, 4-angled, 4–6 mm, conspicuously constricted above ovary; lobes ovate-triangular, 3.5–4.5 mm, inside white scaly, apex acute. Filaments ca. 1 mm; anthers oblong, ca. 1.2 mm. Style erect, glabrous; stigma short, thick. Drupe yellowish red, broadly ellipsoid, 1.5–2.2 cm. Fl. Oct–Nov, fr. Feb–Mar.

• Montane forests; below 1000 m. Guangdong, Guangxi, Hunan, Yunnan.

8. *Elaeagnus geniculata* D. Fang, Acta Phytotax. Sin. 38: 291. 2000.

膝柱胡颓子 xi zhu hu tui zi

Shrubs, evergreen, climbing. Spines absent; young branches with dense reddish scales, later scales turning brown. Petiole brown, 3–7 mm; leaf blade abaxially greenish gray, adaxially drying dark green, ovate, rarely narrowly ovate or ovate-elliptic, (1–)3–6 × (0.5–)1.4–3 cm, papery or thickly papery, abaxially densely scaly, adaxially at first densely scaly, midrib ± flat to slightly impressed, lateral veins 5–8 per side of midrib, incon-

spicuous, base obtuse, margin entire, apex acute. Flowers solitary, often grouped subapically on racemelike lateral shoots 0.5–7.5 cm. Pedicel 3–5 mm. Flowers grayish brown, outside with dense grayish white and sparse brown scales. Calyx tube campanulate, 4-angled, (3–)4 mm, 2–2.5 mm in diam. at mouth, conspicuously constricted above ovary; lobes broadly ovate-triangular, 3.5–4 × ca. 3 mm, inside densely brownish scaly and sparsely white pilose, apex acute. Filaments ca. 1 mm; anthers ca. 1.5 mm. Style bent at ca. middle, slightly thickened, glabrous; stigma oblique, ca. 1 mm. Fruit not seen. Fl. Feb.

- Rocky hills. Guangxi (Longzhou).

Elaeagnus geniculata is known to us only from the protologue.

9. *Elaeagnus obtusa* C. Y. Chang, J. Sichuan Univ., Nat. Sci. Ed. 1984(4): 92. 1984.

钝叶胡颓子 *dun ye hu tui zi*

Shrubs, climbing, ca. 3 m tall. Spines ca. 7 mm; older branches grayish black, scabrous; young branches flexuous, slightly flattened, with dense grayish brown or gray scales. Petiole brown, robust, 1–1.8 cm; leaf blade abaxially drying whitish, adaxially drying green or greenish, slightly glossy, ovate or elliptic, 7–14 × 3.8–6 cm, leathery or thinly leathery, abaxially with dense pale scales mixed with a few brown scales, lateral veins 8–12 per side of midrib, raised adaxially, base rounded or narrowly rounded, margin entire, apex obtuse. Flowers 1–3 on raceme to 7 mm. Pedicel ca. 2 mm. Flowers yellowish, outside densely silvery scaly. Calyx tube campanulate, 4-angled, 4–5 mm, abruptly constricted at base, inside glabrous; lobes broadly ovate, ca. as long as or shorter than tube, inside with sparse pale stellate hairs, apex bluntly acute. Filaments ca. 2 × as long as anthers; anthers oblong-ellipsoid, ca. 1.2 mm. Style erect, up to as long as anthers, glabrous or sparsely stellate-pilose; stigma inflated-compressed, ca. as long as anthers. Fruit not seen.

- Hunan (Yizhang).

Elaeagnus obtusa is known to us only from the protologue.

10. *Elaeagnus formosana* Nakai, Bot. Mag. (Tokyo) 30: 74. 1916.

台湾胡颓子 *tai wan hu tui zi*

Elaeagnus macrophylla Thunberg var. *kotoensis* (Hayata) S. S. Ying; *E. kotoensis* Hayata; *E. nokoensis* Hayata.

Shrubs, evergreen, climbing or sometimes erect. Young branches and buds silvery brown. Petiole 5–10 mm; leaf blade adaxially dark brown when dried, obovate to oblanceolate or elliptic to narrowly elliptic, 4–11 × 2–5 cm, leathery, abaxially densely silvery scaly, lateral veins conspicuously raised adaxially, midrib flat or slightly raised, base rounded or broadly cuneate, margin revolute, apex acute. Flowers solitary or 2–6 in a shortened raceme. Pedicel 1–2 mm. Flowers white, outside densely silvery scaly. Calyx tube 4-angled, 2.8–6 mm; lobes triangular-ovate, ca. as long as tube, apex acuminate. Filaments ca. 0.6 mm; anthers elliptic, 1.5–2 mm. Style erect, 2.2–5.5, glabrous; stigma 2.3–2.5 mm. Drupe ovoid, 1.1–1.6 cm. Seed 8-ribbed, 1–1.4 cm. Fl. Oct–Nov, fr. Feb–Mar.

- Thickets throughout the island; below 2000 m. Taiwan.

This species has been misidentified as *Elaeagnus pungens* (Matsunura & Hayata, J. Coll. Sci. Imp. Univ. Tokyo 22: 356. 1906).

11. *Elaeagnus tonkinensis* Servetaz, Bull. Herb. Boissier, sér. 2, 8: 391. 1908.

越南胡颓子 *yue nan hu tui zi*

Shrubs, evergreen, erect, ca. 3 m tall. Young branches with dense ferruginous scales. Petiole ca. 6 mm, slender, densely dark brown scaly; leaf blade elliptic, 4.5–5.6 × 1.5–2.4 cm, papery, abaxially densely yellowish white scaly, lateral veins 4 or 5 per side of midrib, inconspicuous on both surfaces, base obtuse, margin entire, apex obtuse. Flowers often 2–5 in axils. Pedicel light yellow, 2–3 mm. Flowers nodding, light brown, outside densely scaly. Calyx tube cup-shaped, campanulate, 3.5–4 mm; lobes broadly triangular or broadly ovate, ca. 3 mm, inside with sparse stellate hairs, apex cuspidate. Filaments very short; anthers ellipsoid, ca. 1.8 mm. Style S-shaped. Drupe narrowly ellipsoid, ca. 1.2 × 0.4 cm, rust-colored scaly. Fl. Nov–Dec, fr. Mar–Apr.

Open mountain slopes; 1900–2600 m. SW Yunnan [Vietnam].

12. *Elaeagnus schlechtendalii* Servetaz, Bull. Herb. Boissier, sér. 2, 8: 389. 1908.

小胡颓子 *xiao hu tui zi*

Shrubs, evergreen, erect, ca. 1 m tall. Spines absent; old branches glabrous, glossy; young branches densely brown scaly. Petiole 3–5 mm, brown scaly; leaf blade narrowly elliptic or lanceolate, 3–5.5 × 0.8–1.4 cm, papery or thinly leathery, abaxially densely silvery scaly, lateral veins 3–5 per side of midrib, inconspicuous on both surfaces, base obtuse, margin entire, apex obtuse. Flowers 1–4 in axils. Pedicel grayish white, 2–3 mm. Flowers nodding, silvery white, outside silvery scaly. Calyx tube cup-shaped, campanulate, slightly 4-ribbed, 3–4 mm; lobes elliptic-triangular, ca. as long as tube, inside white scaly and stellate, apex obtuse. Filaments very short, ca. 0.5 mm; anthers oblong, ca. 1 mm. Style erect, slender, glabrous. Drupe broadly ellipsoid, ca. 1.2 cm, rust-colored scaly. Fl. Nov–Dec, fr. Feb–Mar.

Guangxi [NE India (Assam)].

More material is needed to confirm the determination of Chinese material as this NE Indian species.

13. *Elaeagnus oldhamii* Maximowicz, Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 7: 558. 1870 [“*oldhami*”].

福建胡颓子 *fu jian hu tui zi*

Elaeagnus oldhamii var. *nakaii* Hayata.

Shrubs or small trees, evergreen. Young branches and buds densely silvery scaly. Petiole 3–5 mm; leaf blade obovate, 3–6 × 1.3–2.5 cm, papery, scales mostly silvery, lateral veins 4–6 per side of midrib, base cuneate, apex obtuse, rounded, or emarginate. Inflorescences umbellate-racemose, 1–3-flowered, in axils of long shoots and of bracteoles on short shoots. Pedicel 3–4 mm. Flowers white. Calyx tube cup-shaped, ca. 2 mm; lobes 2.5–3.5 mm. Filaments ca. 0.7 mm; anthers narrowly elliptic,

2.5–2.7 mm. Style 0.7–0.9 mm, with stellate hairs. Drupe red, globose or nearly so, 7–9 mm. Seed 7–8 mm. Fl. Nov–Dec, fr. Feb–Mar.

- Open areas; below 500 m. Fujian, Guangdong, Taiwan.

14. *Elaeagnus conferta* Roxburgh, Fl. Ind. 1: 460. 1820.

密花胡颓子 mi hua hu tui zi

Shrubs, straggling. Axillary branches sometimes spine-tipped. Petiole 5–11 mm; leaf blade elliptic to elliptic-oblong, 4.7–11 × 2.3–4.2 cm, abaxially with scales dense, silvery and/or scattered, brownish, adaxially glabrescent, lateral veins 5–11 per side of midrib, base rounded or cuneate, margin obscurely undulate, apex shortly acuminate or subacute. Inflorescence to 8-flowered. Pedicel 1–3 mm. Fruiting pedicel ca. 9 mm. Flowers silvery brown, scaly. Calyx tube tubular, 4-angled, [3–]4.5–9.5 mm, constricted above ovary; lobes ovate, 2–3 mm. Stamens inserted in throat or on narrow annulus, exerted; filaments ca. 1 mm; anthers 0.8–1.2 mm. Style hairy. Drupe ± ellipsoid, 1.3–1.8 × 0.7–1 cm. Fl. Oct–Nov, fr. Feb–Mar. $2n = 28$.

Subtropical forests, dense forests; near sea level to 2100 m. Guangxi, Yunnan [Bangladesh, Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Vietnam].

The fruit are valued because they ripen very early in the year when few other fruit are available. They are eaten fresh, usually with sugar, or are used in preparing sweet drinks. The fruit pulp, roots, and leaves are also used medicinally.

- 1a. Leaf blade 4.7–7.7 × 2.3–3.8 cm, base rounded; drupe ca. 1.8 cm 14a. var. *conferta*
 1b. Leaf blade ca. 11 × 4.2 cm, base cuneate; drupe ca. 1.3 cm 14b. var. *menghaiensis*

14a. *Elaeagnus conferta* var. *conferta*

密花胡颓子(原变种) mi hua hu tui zi (yuan bian zhong)

Leaf blade 4.7–7.7 × 2.3–3.8 cm, abaxially with scales overlapping, mostly silvery, some brownish, lateral veins 5–7 per side of midrib, base rounded, apex shortly acuminate. Calyx ca. 9.5 mm. Stamens inserted in throat; anthers ca. 0.8 mm. Immature drupe ellipsoid, ca. 1.8 × 1 cm.

Near sea level to 1500 m. Guangxi, Yunnan [Bangladesh, Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Vietnam].

14b. *Elaeagnus conferta* var. *menghaiensis* W. K. Hu & H. F. Chow ex C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 107. 1980.

勐海胡颓子 meng hai hu tui zi

Leaf blade abaxially drying green, ca. 11 × 4.2 cm, abaxially with scales not overlapping, center brown and umbonate, margin paler, margin very shortly to deeply fimbriate, lateral veins 8–11 per side of midrib, slightly raised adaxially, base cuneate, apex subacute. Fruiting pedicel ca. 9 mm. Calyx tube 4.5–5 mm; lobes rotate, ca. 2.5 mm. Stamens on narrow annulus, exerted; anthers 1–1.2 mm. Drupe cylindrical-ellipsoid, ca. 1.3 × 0.7 cm, densely brown scaly.

- Dense forests; 1400–2100 m. S Yunnan.

15. *Elaeagnus macrophylla* Thunberg, Fl. Jap. 67. 1784.

大叶胡颓子 da ye hu tui zi

Shrubs, evergreen, slightly scandent. Young branches with white and pale brown scales. Petiole 1–2.5 cm; leaf blade orbicular-ovate to broadly elliptic-ovate, sometimes orbicular, 5–7 × 4–6 cm, leathery, abaxially densely white scaly, adaxially with scattered white scales when young, apex acute to abruptly bluntly acuminate or rounded at both ends. Flowers few in axils. Pedicel 5–8(–10) mm, densely white scaly, sometimes also with reddish brown scales. Calyx tube campanulate, 4–5 mm, abruptly narrowed at base; lobes broadly ovate, slightly shorter than tube. Drupe oblong, 1.5–2 cm, white scaly. Fl. Sep–Oct(–Nov), fr. Mar–Apr.

Thickets near seashores. Jiangsu, Shandong, Taiwan, Zhejiang [Japan (including Ryukyu Islands), S Korea].

Elaeagnus macrophylla is valued horticulturally as a wind-resistant, evergreen hedge plant and for its sweetly scented flowers and very early ripening fruit. The seeds are said to taste like peanuts when divested of the fibrous endocarp. *Elaeagnus ×ebbingei* Doorenbos is an artificial hybrid between *E. macrophylla* and *E. pungens* that is widely distributed in European and North American gardens.

16. *Elaeagnus pallidiflora* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 107. 1980.

白花胡颓子 bai hua hu tui zi

Shrubs, evergreen, erect, 1–3 m tall. Spines gray, longer than 2 cm; young branches with dense white or pale brown scales. Petiole grayish brown, 3–5 mm; leaf blade elliptic, 3–6 × 1.5–3 cm, leathery, abaxially densely silvery scaly, lateral veins 5 or 6 per side of midrib, base rounded or obtuse, margin entire, apex rounded or obtuse. Flowers 1–5 in axils. Flowers nodding, white, outside densely silvery scaly. Calyx tube broadly campanulate, slightly 4-ribbed, ca. 4 mm; lobes broadly ovate, ca. 2 mm, inside sparsely white stellate, apex acute. Filaments very short; anthers oblong, ca. 2 mm. Style slightly curved, with white stellate hairs. Drupe red, broadly ellipsoid, ca. 1.1 × 0.5 cm, densely silvery scaly. Fl. Jan–Mar, fr. Apr–May.

- Forests; 2000–2200 m. NW Yunnan.

17. *Elaeagnus thunbergii* Servetaz, Bull. Herb. Boissier, sér. 2, 8: 384. 1908.

阿里胡颓子 a li hu tui zi

Elaeagnus daibuensis Hayata; *E. morrisonensis* Hayata; *E. oiwakensis* Hayata; *E. wilsonii* H. L. Li.

Shrubs, evergreen, climbing. New branches and buds silvery brown scaly. Petiole 8–18 mm; leaf blade elliptic, 5–10 × 2–5 cm, papery, abaxially densely silvery scaly, adaxially with a few scattered brown scales, lateral veins 6–9 per side of midrib, base acute to obtuse, margin obscurely denticulate to undulate, apex acute to acuminate. Flowers solitary in axils of long shoots and 2–6 in a shortened raceme. Flowers white. Calyx tube 3–7 mm; lobes triangular-ovate, 2–3 mm. Filaments ca. 0.6 mm; anthers elliptic, ca. 1.5 mm. Style 2.5–6.5 mm, with stellate hairs; stigma 2–2.5 mm, glandular-papillate. Drupe red,

broadly elliptic, 1.1–1.4 cm. Seed 8-ribbed, 0.9–1.1 cm. Fl. Aug–Sep.

- Throughout island; below 3000 m. Taiwan.

18. *Elaeagnus wenshanensis* C. Y. Chang, Fl. Sichuan. 1: 463. 1981.

文山胡颓子 *wen shan hu tui zi*

Shrubs, evergreen, erect, 2–3 m tall. Young branches with dense, brownish red, overlapping scales. Petiole brown, 5–7 mm; leaf blade abaxially grayish white, speckled brown, adaxially drying dull green, broadly elliptic, 3–6 × 1.5–3.5 cm, leathery or subleathery, abaxially with overlapping scales; scales mostly white, some brown, especially on midrib, margins ± toothed; adaxially soon glabrous, lateral veins 4–7 per side of midrib, ± conspicuous on both surfaces, base rounded or obtuse, margin entire, apex acuminate. Inflorescence a short raceme 1–5-flowered. Pedicel 6–10 mm. Flowers light white; scales silvery and brown. Calyx tube broadly tubular-campanulate, 4–5 mm; lobes broadly ovate-triangular, 1.5–2.5 mm, inside with lacerate scales, apex acute. Filaments very short; anthers broadly ellipsoid, ca. 1 mm. Style S-shaped, with white stellate hairs. Drupe broadly ellipsoid, ca. 1 × 0.5 cm, with dense brownish rust-colored scales. Fl. Nov–Feb, fr. Mar–Apr.

- Montane areas; 1600–2000 m. Chongqing, SE Sichuan, SE Yunnan.

19. *Elaeagnus taliensis* C. Y. Chang, Acta Phytotax. Sin. 23: 376. 1985.

大理胡颓子 *da li hu tui zi*

Shrubs, evergreen, erect. Spines absent; young branches densely rust-colored scaly. Petiole 6–8 mm, slender, densely red-brown scaly; leaf blade abaxially pale gray, adaxially drying greenish brown or brown, ovate or broadly elliptic, 2–7 × 1.3–3 cm, thinly leathery or papery, abaxially at first with sparse silvery or brown scales, some becoming stellate, adaxially at first with sparse silvery or brown scales, later glabrescent and punctate, lateral veins 6 or 7 per side of midrib, abaxially hardly distinct, adaxially somewhat conspicuous, base ± rounded, margin often slightly revolute or irregular, apex rounded or obtuse. Flowers in axillary clusters of 5–7, mostly toward base of shoots. Pedicel silvery, 4–8 mm. Flowers whitish, outside with dense silvery scales mixed with a few brown scales. Calyx tube tubular-campanulate, 5–6 mm, conspicuously constricted above ovary, enlarged below lobes; lobes triangular, ca. 3 mm, inside pale yellow, sparsely white stellate-pilose, apex bluntly acuminate. Filaments very short; anthers oblong, ca. 1.1 mm. Style straight, densely white stellate-pilose; stigma inflexed, ca. 1.5 mm. Fruit not seen.

- About 1500 m. W Yunnan (Dali, Luxi).

Elaeagnus taliensis is known to us only from the protologue.

20. *Elaeagnus luoxiangensis* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 108. 1980.

罗香胡颓子 *luo xiang hu tui zi*

Shrubs, evergreen, erect or decumbent. Spines absent;

young branches scaly. Petiole rust-colored, 7–9 mm; leaf blade abaxially brownish rust-colored, elliptic, broadly elliptic, or ovate-elliptic, 5–8 × 2.8–4 cm, papery or thinly leathery, abaxially densely fine scaly, lateral veins 8–10 per side of midrib, raised abaxially, inconspicuous adaxially, base rounded, margin entire, apex acute. Flowers 3–5 in axils. Pedicel 3–4 mm. Flowers brownish rust-colored, outside densely rust-colored scaly. Calyx tube tubular-campanulate, 4–4.5 mm; lobes triangular or ovate-triangular, 3.5–4 mm, inside densely brown scaly, apex acute. Filaments very short, ca. 0.5 mm; anthers oblong, ca. 1.5 mm. Style erect, with dense white stellate hairs. Fruit not seen. Fl. Dec–Feb.

- SE Guangxi.

21. *Elaeagnus lanpingensis* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 109. 1980.

兰坪胡颓子 *lan ping hu tui zi*

Small trees or shrubs, evergreen, erect, to 5 m tall. Spines absent; young branches grayish, slender, densely scaly. Petiole 5–10 mm, slightly darker than branches; leaf blade abaxially silvery white, adaxially light green when dried, oblong or oblong-elliptic, 5–9 × 2–4 cm, thinly leathery, abaxially with scales very closely appressed, entire, adaxially soon glabrous except for a few, more persistent scales at base of midrib, lateral veins 7–9 per side of midrib, raised on both surfaces, base rounded, margin shallowly crenate, apex acute. Flowers in axillary clusters of 1–5. Pedicel silvery white, ca. 3 mm. Flowers white, densely light white scaly, scales closely appressed. Calyx tube tubular-funnelform, 4-ribbed, ca. 5.5 mm; lobes oblong-triangular, ca. 3.5 mm, inside loosely scaly, apex acute. Filaments very short, ca. 0.5 mm; anthers oblong, ca. 1.5 mm. Style erect, glabrous or with sparse whitish stellate hairs. Fruit not seen. Fl. Oct–Nov.

- About 2300 m. W Yunnan.

22. *Elaeagnus pilostyla* C. Y. Chang, Fl. Sichuan. 1: 463. 1981.

毛柱胡颓子 *mao zhu hu tui zi*

Shrubs, evergreen, 1.5–2 m tall. Spines absent or ill-defined; young branches slender, densely brown scaly. Petiole brown, ca. 7 mm; leaf blade abaxially silvery brown, adaxially light green when dried, ovate, to 7.5 × 4 cm, stiffly papery, abaxially with scales overlapping, brown with paler margins, shallowly umbonate, shallowly lobed, margins toothed, adaxially glabrous except for few dark scales at base of midrib, lateral veins 4–7 per side of midrib, ± conspicuous on both surfaces, base rounded, margin narrowly revolute, apex acuminate. Flowers to 7 on very short axillary shoots. Pedicel usually curved, reddish brown, 5–8 mm. Flowers nodding, densely reddish brown scaly. Calyx tube obconic, 6–7 mm, with narrow annulus at junction with lobes, glabrous; lobes ovate, ca. 3 × 2.5 mm, inside stellate-hairy, apex acuminate. Filaments very short; anthers oblong, 1.1–1.3 mm. Style erect, curved at apex, with whitish stellate hairs below anthers. Fruit not seen.

- Montane forests; 1900–2100 m. Chongqing (Nanchuan), SE Yunnan (Wenshan).

23. *Elaeagnus xizangensis* C. Y. Chang, Bull. Bot. Res., Harbin 6(2): 74. 1986.

西藏胡颓子 xi zang hu tui zi

Shrubs, evergreen. Older branches gray or blackish; young branches reddish brown, with dense rust-colored scales. Petiole rust-colored, 8–12 mm; leaf blade abaxially whitish, adaxially green, elliptic or broadly elliptic, rarely ovate-elliptic, 6–9.5 × 2.5–4.5 cm, papery or membranous-papery, abaxially with dense silvery scales mixed with sparser brown scales, adaxially at first with white or brown scales, later glabrous, lateral veins 5–7 per side of midrib, at 50°–60° to it, raised abaxially, obscure adaxially, base rounded, margin entire, apex acute, acuminate, or caudate-acuminate. Flowers 1–5 on axillary shoots; rachis rust-colored, 5–7 mm. Pedicel reddish brown, 4–5 mm. Calyx white, outside densely silvery and sparsely brown scaly; tube tubular-funnelform, slightly 4-ribbed, ca. 6 mm, hardly constricted below lobes; lobes ovate-triangular, ca. 3 × 2.3 mm, inside sparsely white stellate-pilose. Filaments very short; anthers broadly ellipsoid, ca. 1 mm. Style erect, usually stellate-pilose; stigma straight. Immature fruit ellipsoid or obovoid-ellipsoid, ca. 1.6 × 0.6 cm.

- Forests; ca. 2400 m. SE Xizang (Médog).

Elaeagnus xizangensis is known to us only from the protologue. It is possibly not separable from the previous species, *E. pilostyla*.

24. *Elaeagnus liuzhouensis* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 110. 1980.

柳州胡颓子 liu zhou hu tui zi

Shrubs, evergreen. Spines absent; young branches densely rust-colored scaly. Petiole brown, 6–8 mm; leaf blade oblanceolate-elliptic, 5.5–7.5 × 2–2.8 cm, papery, abaxially grayish white scaly, adaxially densely stellate when young, lateral veins 7–9 per side of midrib, raised abaxially, slightly impressed adaxially, base narrowly cuneate, margin revolute and crenate, apex acute. Flowers often 1–3 in axils. Pedicel ca. 4 mm, slender. Flowers yellowish white, outside scaly. Calyx tube tubular-funnelform, 4–4.5 mm; lobes ovate-triangular, ca. 3 × 2 mm, inside light white scaly. Filaments shorter than anthers; anthers ca. 1 mm. Style erect, with sparse white stellate hairs. Fruit not seen. Fl. Dec–Jan.

- Guangxi.

25. *Elaeagnus heterophylla* D. Fang & D. R. Liang, Acta Phytotax. Sin. 38: 292. 2000.

异叶胡颓子 yi ye hu tui zi

Shrubs, evergreen. Spines absent; branching often at 90°; young branches densely brown scaly. Petiole brown or rust-brown, 3–5 mm; leaf blade greenish brown on both surfaces, varying from orbicular to lanceolate often along same branch, (1.2–)1.9–6.5 × (0.6–)1.1–2.4 cm, papery, both surfaces densely stellate-puberulous and somewhat sparsely brown scaly, adaxially glabrescent, midrib slightly raised abaxially, somewhat impressed adaxially, lateral veins 4–9 per side of midrib, inconspicuous, base rounded, margin entire, apex acuminate to rounded. Flowers in axillary clusters of (1–)3–5; rachis 2–4 mm. Pedicel 1–2 mm. Flowers gray-brown, outside densely silvery

and brown scaly and sparsely silvery stellate-puberulous. Calyx tube broadly tubular-campanulate or tubular-funnelform, 4.5–5 mm, 3–3.5 mm in diam. at mouth; lobes broadly ovate, ca. 3 × 2.5–3 mm, inside grayish white stellate-pilose and sparsely brownish scaly, apex acute. Filaments ca. 0.6 mm; anthers ca. 1.5 mm. Style erect, stellate-pilose; stigma deflexed, ca. 2 mm. Fruit not seen. Fl. Nov.

- Slopes. Guangxi (Jinxiu).

Elaeagnus heterophylla is used medicinally. It is known to us only from the protologue.

26. *Elaeagnus tubiflora* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 111. 1980.

管花胡颓子 guan hua hu tui zi

Shrubs, evergreen, erect. Spines absent; young branches with dense rust-colored scales. Petiole rust-colored, 7–8 mm; leaf blade narrowly elliptic or elliptic, 6–9 × 2–3 cm, thin leathery or papery, abaxially with dense brown stellate scales, lateral veins 6–8 per side of midrib, conspicuous on both surfaces, base cuneate, margin entire, apex acuminate. Flowers often 5–7 in axils. Pedicel dark brown, 5–6 mm. Flowers yellowish white, outside densely scaly, scales silvery and brown. Calyx tube narrowly tubular, 9–10 mm, slightly constricted at base, abruptly widening below lobes; lobes ovate, ca. 5 × 3 mm, inside densely brown stellate-scaly, apex acuminate. Filaments ca. 1.5 mm; anthers ellipsoid, ca. 1 mm. Style erect, with sparse white stellate hairs. Fruit not seen. Fl. Oct–Nov.

- Montane forests; 1600–2000 m. SE Yunnan (Malipo).

27. *Elaeagnus bockii* Diels, Bot. Jahrb. Syst. 29: 482. 1900.

长叶胡颓子 chang ye hu tui zi

Shrubs, evergreen, erect, 1–3 m tall. Spines often present, thick; young branches with dense rust-colored or brown scales. Petiole brown, 4–8 mm; leaf blade adaxially drying pale green, narrowly oblong-elliptic to narrowly lanceolate, 3–9 × 0.8–3.5 cm, papery or subleathery, abaxially with overlapping silvery scales, older leaf blades with scattered brown scales, scales obscurely lobed and deeply fimbriate-lacerate, adaxially soon glabrous, lateral veins 5–7 per side of midrib, slightly raised on both surfaces, base tapered, margin very narrowly revolute, apex acuminate or rounded. Flowers 5–7 in axils. Pedicel 3–5 mm; fruiting pedicel 4–13 mm. Flowers white, outside densely scaly; scales silvery, irregularly lobed, shallowly lacerate. Calyx tube tubular or funnelform-tubular, 5–7 mm; lobes ovate-triangular, 2.5–3 mm, inside sparsely white stellate-scaly, apex acute. Filaments very short, ca. 0.5 mm; anthers oblong, ca. 1.2 mm. Style erect, curved at apex, densely whitish stellate-hairy to subglabrous. Drupe red, broadly cylindrical, 1–1.2 cm. Fl. Oct–Nov, fr. Apr.

- Eastern mountain slopes, among roadside shrubs; 600–2400(–2900) m. Gansu, Guizhou, Hubei, Shanxi, Sichuan.

- 1a. Leaf apex acuminate; fruiting pedicel 4–6 mm 27a. var. *bockii*
- 1b. Leaf apex rounded; fruiting pedicel 10–13 mm 27b. var. *muliensis*

27a. *Elaeagnus bockii* var. *bockii*

长叶胡颓子(原变种) chang ye hu tui zi (yuan bian zhong)

Branches spiny. Leaf blade narrowly elliptic to narrowly lanceolate, 4–9 × 1–3.5 cm, apex acuminate. Fruiting pedicel 4–6 mm. Style densely whitish stellate-hairy. Drupe broadly cylindrical, ca. 1 cm.

• Eastern mountain slopes, among roadside shrubs; 600–2100 m. Gansu, Guizhou, Hubei, Shanxi, Sichuan.

27b. *Elaeagnus bockii* var. *muliensis* C. Y. Chang, Fl. Sichuan. 1: 463. 1981.

木里胡颓子 mu li hu tui zi

Branches hardly spiny or spiny. Leaf blade narrowly oblong-elliptic, 3–5 × 0.8–1.5 cm, apex rounded. Fruiting pedicel 10–13 mm. Upper calyx tube hardly constricted. Style subglabrous. Drupe ellipsoidal, ca. 1.2 × 0.5 cm.

• 1800–2400(–2900) m. SW Sichuan (Muli).

28. *Elaeagnus davidii* Franchet, Pl. David. 2: 115. 1888 [“*davidii*”].

四川胡颓子 si chuan hu tui zi

Shrubs, deciduous, much branched, 0.9–1.2 m tall. Spines to 1 cm, slender; older branches gray, glabrous; young branches rust-colored. Petiole rust-colored, 2–3 mm, slender; leaf blade elliptic, 1.7–2.5 × 0.9–1.1 cm, stiff, leathery, abaxially with overlapping silvery scales and scattered brown scales, adaxially very sparsely scaly when young, then glabrous, lateral veins usually 4 per side of midrib, slightly raised abaxially, indistinct adaxially, base rounded, margin entire, apex rounded or subacute. Flowers solitary in axils of deciduous bracts on new shoots. Pedicel ca. 1.5 mm. Flowers scaly outside, scales mostly silvery, some brown. Calyx tube campanulate, ca. 3 mm; lobes broadly ovate, both surfaces with rust-colored and silvery scales. Filaments very short; anthers ellipsoid, ca. 2 × as long as filaments. Style densely pubescent; stigma incurved. Fruit not seen.

• On rocks. Sichuan.

The placement of this species is very uncertain, as the leaf blade is said to be stiff and leathery but also deciduous, and there is no information on the time of flowering. The very small, *Buxus*-like leaves seem distinctive.

29. *Elaeagnus retrostyla* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 112. 1980.

卷柱胡颓子 juan zhu hu tui zi

Shrubs, evergreen, erect, to 1.5 m tall. Spines 5–7 mm; young branches densely brown scaly. Petiole brown, 8–14 mm; leaf blade narrowly elliptic or lanceolate, 4.5–8.5 × 1.2–2.5 cm, leathery, abaxially grayish white scaly, lateral veins 7 or 8 per side of midrib, base narrowly cuneate, margin conspicuously revolute, apex long acuminate. Flowers 2–4 in axils. Pedicel 5–7 mm. Flowers light yellow, outside densely silvery scaly. Calyx tube campanulate, slightly 4-ribbed, ca. 5 mm; lobes triangular, ca. 3.5 mm, inside sparsely white stellate-scaly, apex

acuminate. Filaments triangular, ca. 0.5 mm; anthers oblong, ca. 1.3 mm. Style erect, coiled into a spiral up to base of lobes, sparsely stellate-hairy; stigma expanded, ca. 1.5 mm. Fruit not seen. Fl. Sep–Oct.

• Bushland on south-facing mountain slopes; 1400–1500 m. W Guizhou.

30. *Elaeagnus lanceolata* Warburg ex Diels, Bot. Jahrb. Syst. 29: 483. 1900.

披针叶胡颓子 pi zhen ye hu tui zi

Elaeagnus lanceolata subsp. *grandifolia* Servettaz; *E. lanceolata* subsp. *rubescens* Lecomte; *E. lanceolata* subsp. *stricta* Servettaz.

Shrubs, evergreen, erect or divaricate, to 4 m tall. Spines absent or on old branchlets; young branches densely scaly. Petiole yellow-brown, 5–7 mm; leaf blade lanceolate, oblong-lanceolate, or narrowly oblong, 5–15 × 1.5–8 cm, leathery, abaxially densely silvery scaly, adaxially scaly when young, glabrescent, lateral veins 8–12 per side of midrib, inconspicuous abaxially, conspicuous adaxially, base rounded, margin entire, revolute, apex acuminate. Flowers often 3–5 in axils. Pedicel 3–5 mm, slender. Flowers yellowish white, outside densely silvery scaly. Calyx tube tubular, 5–6 mm, abruptly constricted above ovary; lobes broadly triangular, 2.5–3 mm, inside sparsely white stellate, apex acuminate. Filaments very short or absent; anthers oblong, ca. 1.5 mm. Style erect, glabrous or sparsely stellate-hairy; stigma 2–3 mm. Drupe red, ellipsoid, 1.2–1.5 cm × 5–6 mm, densely scaly. Fl. Aug–Oct, fr. Apr–May.

• Valley forests; 300–2900 m. Gansu, Guangxi, Guizhou, Hubei, Shanxi, Sichuan, Yunnan.

31. *Elaeagnus viridis* Servettaz, Bull. Herb. Boissier, sér. 2, 8: 388. 1908.

绿叶胡颓子 lü ye hu tui zi

Elaeagnus viridis var. *delavayi* Lecomte.

Shrubs, evergreen, erect, to 2 m tall. Spines sometimes strongly reflexed, ca. 1 cm, slender; young branches with dense rust-colored scales. Petiole rust-colored, 5–7 mm; leaf blade adaxially drying green, elliptic to oblong-elliptic, 2.5–6.5 × 1.2–2.6 cm, thinly leathery or papery, abaxially densely silvery scaly, lateral veins 6 or 7 per side of midrib, slightly conspicuous on both surfaces, base cuneate, margin entire, apex acute. Flowers 1–3 in axils. Pedicel 2–3 mm; fruiting pedicel ca. 15 mm. Flowers nodding, white, outside densely silvery scaly. Calyx tube broadly tubular, ca. 5 mm; lobes broadly ovate or ovate-triangular, ca. 2.5 mm, inside sparsely whitely stellate, apex acuminate. Filaments very short; anthers oblong. Style erect, sparsely stellate-hairy. Drupe ellipsoid, ca. 1.3 × 0.7 cm, silvery scaly (var. *delavayi*). Fl. Oct–Nov.

• Open bushland on sandy soil; 500–1200 m. W Hubei, S Shanxi.

Fruiting material has been described as *Elaeagnus viridis* var. *delavayi* but it is not possible to assess the status of such plants without knowledge of comparable material of both var. *viridis* and var. *delavayi*.

32. *Elaeagnus longiloba* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 113. 1980.

长裂胡颓子 chang lie hu tui zi

Shrubs, evergreen, erect. Spines ca. 7 mm; young branches with dense grayish yellow scales. Petiole light brown, 6–10 mm, slender; leaf blade adaxially drying brown, obovate-lanceolate or elliptic, 5–7.5 × 2–3 cm, papery, abaxially densely white scaly, lateral veins 5 or 6 per side of midrib, base narrowly cuneate, margin entire, apex acute or acuminate. Flowers often 1–3 in axils. Pedicel brown, ca. 4 mm. Flowers white, outside densely silvery scaly. Calyx tube tubular, ca. 6 mm; lobes narrowly triangular, ca. 4 mm, inside sparsely stellate, apex acuminate. Filaments very short; anthers oblong, ca. 1 mm. Style erect, glabrous or with sparse stellate hairs. Fruit not seen. Fl. Sep–Nov.

- W Guizhou.

33. *Elaeagnus xichouensis* C. Y. Chang, Acta Phytotax. Sin. 23: 377. 1985.

西畴胡颓子 xi chou hu tui zi

Shrubs, evergreen, erect or climbing. Spines absent; branches robust, diverging at ca. 90°, densely brown scaly; young branches with dense yellowish gray scales. Petiole brown, 6–12 mm; leaf blade abaxially canescent, adaxially green, elliptic or ovate, 6–12 × 4.5–5 cm, leathery, abaxially with dense silvery scales and sparse brown scales, adaxially scaly when young, then glabrous, impressed punctate, midrib raised abaxially, impressed adaxially, lateral veins 6 or 7 per side of midrib, inconspicuous abaxially, raised adaxially, base rounded or cuneate, margin undulate or entire, apex rounded or bluntly acute. Flowers in clusters of 2–4 along axils or reduced, often leafless, axillary shoots. Pedicel 2–4 mm, slender; fruiting pedicel 1.2–1.4 cm. Flowers whitish, outside densely silvery scaly. Calyx tube tubular, 6.5–7 mm, not widening at base of lobes; lobes ovate-triangular or ovate-oblong, ca. 3.8 mm, inside sparsely white stellate-pilose with few brownish scales, apex bluntly acute. Filaments nearly absent; anthers oblong, ca. 2.1 mm. Style erect, longer than tube, densely or sparsely stellate-pilose; stigma ca. 2 mm, acute; disk hardly distinct but densely villous. Drupe ellipsoid, ca. 1.5 × 0.75 cm, brown scaly.

- Mountain forests; 1400–1900 m. SE Yunnan.

Elaeagnus xichouensis is known to us only from the protologue.

34. *Elaeagnus delavayi* Lecomte, Notul. Syst. (Paris) 3: 156. 1915.

长柄胡颓子 chang bing hu tui zi

Shrubs, evergreen, erect. Spines absent; young branches with dense rust-colored or brown scales. Petiole 1.2–1.5 cm, densely red-brown scaly; leaf blade abaxially grayish green, elliptic or oblong-lanceolate, 5–8.5 × 1.6–3.3 cm, thinly leathery or papery, abaxially silvery scaly, lateral veins 6–8 per side of midrib, faintly conspicuous on both surfaces, base cuneate, margin entire, apex rounded or obtuse. Flowers often 5–7 in axils. Pedicel (5–)6–8(–10) mm. Flowers whitish, outside densely silvery scaly. Calyx tube tubular, faintly 4-ribbed, 6–7 mm,

conspicuously constricted above ovary; lobes triangular, 2.5–3 mm, inside densely scaly and stellate, apex acuminate. Filaments short, ca. 0.5 mm; anthers oblong, ca. 1 mm. Style slightly curved, densely white stellate-villous; stigma inflexed, ca. 1.3 mm. Drupe ca. 12 × 6 mm. Fl. Sep–Dec, fr. Feb–May.

- Open forest or thickets on eastern slopes; 1300–3100 m. Yunnan.

35. *Elaeagnus xingwenensis* C. Y. Chang, Fl. Sichuan. 1: 464. 1981.

兴文胡颓子 xing wen hu tui zi

Shrubs, evergreen, ca. 3 m tall. Spines not seen. Petiole brown, ca. 1.8 cm; leaf blade adaxially drying pale gray-brown, narrowly elliptic, ca. 9.5 × 3 cm, leathery, abaxially with overlapping scales, scales pale brown with paler margins, irregularly lobed, margin toothed, adaxially with scales irregularly lobed, soon lost, lateral veins 5 or 6 per side of midrib, obscure, base cuneate, margin revolute, apex acuminate. Inflorescence in axils of mature leaves. Flowers not seen. Fruiting pedicel to 2 cm. Drupe ellipsoid-fusiform, ca. 1.4 × 0.7 cm.

- About 1200 m. SE Sichuan (Xingwen).

Elaeagnus xingwenensis is known to us only from the protologue.

36. *Elaeagnus sarmentosa* Rehder in Sargent, Pl. Wilson. 2: 417. 1915.

攀缘胡颓子 pan yuan hu tui zi

Shrubs, climbing, 2–10 m. Spines present, ca. 1.5 cm. Petiole ca. 1.5 cm, densely red-brown scaly; leaf blade abaxially gray with brown speckles, adaxially drying grayish green, elliptic, 8–16 × 2.2–6 cm, papery, abaxially with scales gray-white, often with brown center, circular with regularly fimbriate-ciliate margin, adaxially with scales dark brown, soon restricted to base of midrib, lateral veins 5 or 6 per side of midrib, slender, raised and brown abaxially, slightly raised adaxially, base rounded to broadly cuneate, margin entire, apex acuminate. Flowers 1 or 2 per axil. Pedicel brown, 6–7 mm. Flowers outside with dense silvery brown scales. Calyx tube tubular-obconic, 8–9 mm, abruptly widening below lobes; lobes triangular-ovate, 5.5–6 × ca. 3.5 mm, inside densely stellate-hairy, apex acuminate. Drupe narrowly ellipsoid, conspicuously 8-ribbed, brown villous. Fl. Oct–Nov, fr. Mar.

- Mountain forests; 1100–1900 m. Guangxi, Yunnan.

37. *Elaeagnus cinnamomifolia* W. K. Hu & H. F. Chow ex C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 114. 1980.

樟叶胡颓子 zhang ye hu tui zi

Shrubs, evergreen, climbing. Spines absent; young branches yellowish brown, scaly. Petiole light brown, 8–16 mm; leaf blade narrowly obovate to broadly oblanceolate, 6–15 × 3.5–6 cm, papery, abaxially densely silvery scaly, lateral veins 5 or 6 per side of midrib, base cuneate, margin entire and narrowly revolute, apex acuminate. Flowers often 1–3 in axils. Pedicel ca. 7 mm. Flowers silvery white, thick, outside densely silvery scaly. Calyx tube tubular-funnelform, faintly 4-ribbed, 8–9 mm; lobes narrowly triangular, 4–6 mm, inside densely silvery scaly,

apex acuminate. Filaments very short; anthers oblong, ca. 1.5 mm. Style curved at upper ca. 9 mm, glabrous. Fruit not seen. Fl. Nov–Jan.

- By streams in valleys; 400–600 m. E Guangxi.

38. *Elaeagnus glabra* Thunberg in Murray, Syst. Veg., ed. 14, 164. 1784.

蔓胡颓子 man hu tui zi

Elaeagnus buisanensis Hayata; *E. erosifolia* Hayata; *E. glabra* subsp. *oxyphylla* Servettaz; *E. glabra* subsp. *tenuiflora* (Benth.) Servettaz; *E. longidrupa* Hayata; *E. paucilepidota* Hayata; *E. tenuiflora* Benth.

Shrubs, evergreen. Young branches and buds with dense silvery brown scales. Petiole 7–10 mm; leaf blade elliptic to obovate, 5–10 × 2–3 cm, papery, abaxially partially covered with brown or rarely silvery scales, lateral veins 6 or 7 per side of midrib, base obtuse or rounded, apex acute to obtuse or rounded. Inflorescence a short raceme in axils of mature leaves 2–8-flowered, or sometimes flowers solitary along long shoot. Pedicel 3–4 mm. Flowers silvery brown. Calyx tube 5–6 mm; lobes triangular-ovate, 2–3 mm. Filaments ca. 0.8 mm; anthers elliptic, 1.5–1.8 mm. Style glabrous; stigma ca. 3 mm, glandular-papillate. Drupe red-orange, broadly elliptic to elliptic, 1.4–1.8 cm. Seed 1.7–1.8 cm. Fl. Sep–Nov, fr. Apr–May.

Thickets; ca. 2200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang [Japan (including Ryukyu Islands), S Korea].

Material from Japan, including the type, has longer pedicels, 4–7 mm, more reddish brown scales, and the leaf apex acute to acuminate or often caudate with an obtuse tip.

39. *Elaeagnus pungens* Thunberg in Murray, Syst. Veg., ed. 14, 164. 1784.

胡颓子 hu tui zi

Shrubs, evergreen, 3–4 m tall, densely branched. Spines frequent; young branches densely brown scaly. Petiole robust, 5–15 mm, rugose, brown scaly; leaf blade oblong to narrowly so, 5–10 × 1.8–3.5 cm, leathery, abaxially with dense whitish and usually also brown scales, adaxially glabrous and glossy, lateral veins 7–9 per side of midrib, base rounded, margin obsoletely toothed with prominently undulate margins, apex obtuse to bluntly acute. Flowers few, clustered in axils. Pedicel 5–8 mm, brown scaly. Calyx tube funnellform, rather broad, 6–7 mm, abruptly narrowed at base; lobes ovate, ca. 1/2 as long as tube, apex rounded. Drupe oblong, 1.2–1.5 cm, brown scaly. Fl. Sep–Dec, fr. Apr–Jun.

Open slopes, roadsides or thickets, often near the sea; below 1000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang [Japan].

40. *Elaeagnus tutcheri* Dunn, J. Bot. 45: 404. 1907.

香港胡颓子 xiang gang hu tui zi

Shrubs, erect. Spines absent; most parts densely scaly. Petiole 6–8 mm; leaf blade suborbicular or ovate, 4–8 × 2–3.5 cm, papery or thinly leathery, often bullate, adaxially glossy, lateral

veins 5–7 per side of midrib at 50°–60° to midrib, veins conspicuous above. Flowers in short racemes or few flowered clusters; peduncle 2–3 mm. Pedicel 6–8 mm. Calyx tube campanulate, 7–8 × ca. 3 mm; lobes erect, ovate, shorter than tube. Style glabrous. Drupe cylindrical-ovoid, 1–1.2 cm. Fl. Nov–Dec, fr. Mar.

- About 500 m. Hong Kong.

The protologue described the endocarp as “3-keeled” but this must surely be a typographical error for “8-keeled.”

41. *Elaeagnus henryi* Warburg ex Diels, Bot. Jahrb. Syst. 29: 483. 1900.

宜昌胡颓子 yi chang hu tui zi

Elaeagnus fargesii Lecomte.

Shrubs, evergreen, climbing. Spines sometimes present, stout; young branches with overlapping dull silvery gray and pale brown scales. Petiole 8–10 mm, indumentum as for stem; leaf blade abaxially slightly brownish on midrib, adaxially brownish green when dried, broadly lanceolate to ovate, 6–15 × 3–6 cm, leathery, abaxially with overlapping silvery scales, adaxially densely scaly when young but soon glabrous, lateral veins 5–7 per side of midrib, raised abaxially, inconspicuous adaxially, base broadly cuneate to rounded, margin revolute, apex acuminate. Flowers mostly 1 per axil, sometimes clustered on reduced axillary shoots. Pedicel ca. 2 mm, reddish brown scaly. Calyx tube obconic-tubular, ± 4-angular, 6–8 × 2–3 mm, abruptly widening below lobes, outside with dense silvery white scales and scattered brown scales; lobes triangular, inside sparsely pale brown scaly, apex acuminate. Drupe 5–8 mm. Fl. Oct–Nov, fr. Apr.

- Valley forests; 500–1800(–2700) m. Guangdong, Guizhou, Hubei, Hunan, Yunnan.

42. *Elaeagnus difficilis* Servettaz, Bull. Herb. Boissier, sér. 2, 8: 386. 1908.

巴东胡颓子 ba dong hu tui zi

Shrubs, evergreen, spreading or scandent, 2–3 m tall. Lateral branches ± spine-tipped; young branches with overlapping brown, pale brown, or reddish brown and off-white scales. Petiole 8–15 mm, indumentum as for stem; leaf blade abaxially brownish green, adaxially olive-green when dried, lanceolate, 7–13.5 × 2.2–6 cm, papery to leathery, abaxially with scales overlapping, silvery or ferruginous, adaxially glabrous except for brown scales on midrib, lateral veins 5–9 per side of midrib, inconspicuous on both surfaces or raised and with darker scales abaxially, base rounded or cuneate, margin narrowly revolute, apex slightly acuminate. Flowers 1–5 in axils of new lateral shoots, sometimes on very contracted short shoots. Pedicel 1–12 mm, pale brown scaly. Flowers nodding. Calyx densely reddish brown scaly; tube tubular or tubular-campanulate to slightly funnellform, 4.5–5 × 2.7–4 mm, constricted above ovary, abruptly widening below lobes; lobes triangular-ovate, 2.5–3 × ca. 2.5 mm, inside stellate-pilose, apex acute or apiculate. Anthers oblong-ellipsoid, 1.2–1.7 mm. Style flexuous, glabrous. Drupe salmon- or orange-red, cylindrical, 1.4–1.7 cm × 6–9 mm, 8-ribbed. Fl. Apr, fr. May–Jun.

• 600–1800 m. Chongqing, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan.

- 1a. Leaf blade 3–6 cm wide, abaxially with most scales silvery, a few scattered scales larger and brown 42a. var. *difficilis*
 1b. Leaf blade ca. 2.2 cm wide, abaxially with most scales with raised brown centers 42b. var. *brevistyla*

42a. *Elaeagnus difficilis* var. *difficilis*

巴东胡颓子(原变种) ba dong hu tui zi (yuan bian zhong)

Elaeagnus cuprea Rehder.

Leaf blade lanceolate, 7–13.5 × 3–6 cm, papery or thinly leathery, abaxially with scales mostly silvery, overlapping, slightly brownish on midrib, plus scattered larger brown scales, lateral veins inconspicuous on both surfaces. Inflorescence 1–5-flowered, sometimes on very contracted short shoots. Pedicel 8–12 mm. Calyx tube tubular-campanulate, ca. 5 × 4 mm; lobes ca. 2.5 mm.

• 600–1800 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan.

42b. *Elaeagnus difficilis* var. *brevistyla* W.K. Hu & H.F. Chow, Fl. Sichuan. 1: 464. 1981.

短柱胡颓子 duan zhu hu tui zi

Spines shorter. Leaf blade narrowly lanceolate, ca. 7 × 2.2 cm, leathery, abaxially with scales mostly brown umbonate, subentire, lateral veins raised and with darker scales abaxially, impressed adaxially. Inflorescence 1–3-flowered, continuing growth to form lateral shoot. Pedicel 2.5–4 mm. Calyx scales more irregularly divided; tube tubular to slightly funnelform, ca. 4.5 × 2.7 mm; lobes ca. 3 mm. Filaments ca. 1 mm. Style slightly longer than calyx tube.

• 1600–1800 m. Chongqing (Nanchuan).

43. *Elaeagnus yunnanensis* Servettaz, Bull. Herb. Boissier, sér. 2, 8: 385. 1908.

云南胡颓子 yun nan hu tui zi

?Shrubs, evergreen. Spines absent; young branches flexuous, rust-colored, slender, tomentose. Petiole 6–7 mm, tomentose; leaf blade abaxially silvery, adaxially drying black, oblong-lanceolate, 5–6 × 1.8–2 cm, membranous, lateral veins 6–8 per side of midrib and at ca. 60° to it, raised abaxially, impressed adaxially, base nearly rounded, margin entire, apex long acuminate. Flowers suberect, solitary or paired or 3–6 on short branch in axil of juvenile leaves. Pedicel 0.5–1 mm. Flowers silvery and brownish tomentose especially toward base. Calyx tube tubular, slightly 4-angled, ca. 6 mm, slightly enlarged below lobes; lobes ovate, ca. 6 mm, inside sparsely stellate-hairy, apex long acuminate. Filaments nearly absent; anthers ellipsoid. Style glabrous; stigma slightly incurved. Drupe ellipsoid, (1.5–) 2.2–2.5 × 0.8–1.3 cm, densely brown scaly and sparsely whitish hairy; stipe 6–10(–15) mm, pendent. Fl. Apr, fr. May.

• Sparse forests, scrub; 1500–2300 m. C Yunnan.

44. *Elaeagnus angustifolia* Linnaeus, Sp. Pl. 1: 121. 1753.

沙枣 sha zao

Shrubs or small trees, 3–7(–10) m tall. Bark reddish brown; spines absent or sharp, 0.7–3 cm; young branches and both leaf surfaces silvery white, densely stellate-scaly, or adaxially grayish green or green and nearly without scales (var. *virescens*). Petiole 5–8 mm, 1/5–1/4 as long as blade; leaf blade oblong-lanceolate to linear-lanceolate, sometimes elliptic-lanceolate, ovate, or oblong-ovate, (2.5–)4–8(–10) × 0.4–3.2(–4) cm, adaxially dull green, or both surfaces silvery, with only white scales, base usually broadly cuneate, apex obtuse or subacute. Flowers 1–3 in axils of older leaves. Pedicel short, ca. 2 mm. Flowers fragrant, outside silvery white, with dense white scales and sparse small yellowish glands, inside yellow. Calyx tube campanulate or broadly campanulate (f. *culta*), ca. as long as limb, 5–6 × 2.5–3(–5) mm; lobes lanceolate, ovate, or triangular-lanceolate, slightly shorter than tube, inside yellow and glabrous, with sparse small brownish glands, distinctly 3-veined, apex ± acute. Filaments short; anthers oblong. Style base enclosed by tubular disk, curved in upper part, ca. as long as calyx. Drupe yellowish brown, globose-ovoid, globose, or subglobose (var. *casica*), 0.7–2.5 × 0.5–1.3 cm, densely silvery scaly when young, subglabrous when mature; scales sparse, brownish; flesh sweet, mealy; stone oblong, oblong-ovoid, or narrowly cylindrical (f. *culta*), both ends obtuse or pointed. Fl. May–Jun, fr. Aug–Oct. 2n = 28.

Sea coasts, river and lake shores, dry river beds, mountains. Gansu, Hebei, Henan, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Xinjiang [Afghanistan, NW India, Kazakhstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, E Europe; naturalized in North America].

This species is widely grown for its fruit (“Russian Olive,” “Trebizond date”), and local cultivars have been developed. It also produces a valuable gum and useful timber, and is used for land reclamation. It can be invasive and has been declared a noxious weed in some parts of North America.

- 1a. Leaf blade 0.4–1.5 cm wide 44a. var. *angustifolia*
 1b. Leaf blade 1.8–3.2 cm wide 44b. var. *orientalis*

44a. *Elaeagnus angustifolia* var. *angustifolia*

沙枣(原变种) sha zao (yuan bian zhong)

Elaeagnus angustifolia var. *casica* Sosnowsky; *E. angustifolia* f. *culta* Sosnowsky; *E. angustifolia* var. *virescens* Sosnowsky; *E. hortensis* M. Bieberstein; *E. hortensis* subsp. *moorcroftii* (Wallich ex Schlechter) Servettaz; *E. moorcroftii* Wallich ex Schlechter; *E. oleaster* Linnaeus.

Leaf blade lanceolate, oblong-linear, or linear-lanceolate, 2.5–7 × 0.4–1.5 cm. Drupe 0.7–1.4 × 0.5–1 cm, or larger, olive-shaped, 1.7–2 × ca. 1.3 cm (f. *culta*). Fl. May–Jun, fr. Sep.

Sea coasts, river and lake shores, dry river beds, mountains. Gansu, Hebei, Henan, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Xinjiang [Afghanistan, NW India, Kazakhstan, Mongolia, NE Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, E Europe; naturalized in North America].

44b. *Elaeagnus angustifolia* var. *orientalis* (Linnaeus) Kuntze, *Trudy Imp. S.-Peterburgsk. Bot. Sada* 10: 235. 1887.

东方沙枣 *dong fang sha zao*

Elaeagnus orientalis Linnaeus, *Syst. Nat.*, ed. 12, 2: 127; *Mant. Pl.* 1: 41. 1767; *E. angustifolia* subsp. *orientalis* (Linnaeus) Soják.

Leaf blade 1.8–3.2 cm wide. Drupe 1.5–2.5 cm.

Gansu, Ningxia, Xinjiang [Afghanistan, Pakistan, Russia, Turkmenistan; SW Asia (Iran, Turkey)].

45. *Elaeagnus oxycarpa* Schlechtendal, *Linnaea* 30: 344. 1860.

尖果沙枣 *jian guo sha zao*

Elaeagnus angustifolia Linnaeus var. *spinosa* Kuntze.

Trees, deciduous, 5–20 m tall, with reddish brown bark. Spines absent or sharp, 0.7–3 cm; young branches and both leaf surfaces silvery white, densely stellate-scaly, or adaxial leaf surface grayish green. Petiole 6–10 mm, slender, densely white scaly; leaf blade oblong-linear or linear-lanceolate, 3–7 × 0.6–1.8 cm, lateral veins 7–9 per side of midrib, inconspicuous on both surfaces, apex acute or acuminate. Flowers 1–3 in leaf axils. Pedicel ca. 2 mm. Flowers white, fragrant. Calyx tube campanulate or funnelform, ca. 4 mm, abruptly constricted above ovary; lobes narrowly ovate, ca. 3.6 × 2 mm, inside yellow and glabrous, apex acuminate. Filaments slightly white, ca. 0.4 mm; anthers oblong, ca. 2 mm. Style elongate, curved in upper part. Drupe yellowish brown when ripe, globose-ovoid, or subglobose, 0.9–1 cm × 6–8 mm, sparsely brownish scaly, subglabrous. Fl. May–Jun, fr. Sep–Oct.

Deserts, farmland, roadsides; 400–700 m. Gansu, Xinjiang [Russia].

46. *Elaeagnus mollis* Diels, *Bot. Jahrb. Syst.* 36(Beibl. 82): 78. 1905.

翅果油树 *chi guo you shu*

Trees or shrubs, deciduous, erect, 2–10 m tall, to 8 cm d.b.h., with grayish brown bark. Spines absent; young branches grayish green, densely stellate-scaly. Petiole 6–10 mm; leaf blade abaxially grayish green, adaxially dark green, ovate or ovate-elliptic, 6–9(–15) × 3–6(–11) cm, papery, abaxially densely grayish stellate-tomentose, adaxially sparsely stellate-hairy, lateral veins 6–10 per side of midrib, base obtuse or rounded, apex acute. Flowers often 1–3(–5) in leaf axils. Pedicel 3–4 mm. Flowers nodding, grayish green, fragrant, grayish white stellate-tomentose. Calyx tube campanulate, ca. 4 mm, abruptly constricted above ovary; lobes subtriangular or sublancoolate, 3.5–4 mm, inside sparsely white stellate-hairy, apex acuminate. Anthers ellipsoid, ca. 2 mm. Style erect, curved in upper part, lower part densely villous. Drupe globose-ovoid, or subglobose, ca. 1.3 cm, conspicuously 8-ribbed, winged, densely villous. Fl. Apr–May, fr. Aug–Sep. $2n = 28^*$.

• Valleys, shaded areas; 700–1300 m. Shaanxi (Huxian), S Shanxi.

The winged fruit of *Elaeagnus mollis* is extremely distinctive. The species is very local and of some conservation concern.

47. *Elaeagnus grijsii* Hance, *Ann. Sci. Nat., Bot.*, sér. 4, 15: 227. 1861.

多毛羊奶子 *duo mao yang nai zi*

Shrubs, deciduous or semievergreen, erect or divaricate, ca. 2 m tall. Spines present or absent; branches, leaves, and flowers with dense long-stalked stellate hairs. Petiole 4–7 mm; leaf blade ovate or broadly ovate, 2.7–7 × 2.7–3.8 cm, papery or membranous, abaxially with dense long-stalked stellate hairs, lateral veins 4 or 5 per side of midrib, base rounded to truncate, margin entire, apex bluntly acuminate to obtuse. Flowers 7–10-fasciated in axils of leaves on long shoots and of bracteoles on short shoots. Pedicel 2–3 mm; fruiting pedicel 1–2.5 cm, thick. Flowers brown. Calyx tube campanulate, 4-ribbed, 6–6.5 mm; lobes ovate-triangular, ca. 3.5 mm, outside with scales only, inside glabrous. Filaments very short; anthers narrowly elliptic, ca. 1.5 mm. Style erect, not longer than stamens, glabrous. Drupe narrowly ellipsoid, ca. 1.8 × 0.6 cm, with dense rust-colored scales. Fl. Jan–Feb, fr. Apr–May.

• Bushland on south-facing mountain slopes; 600–800 m. Fujian (Anxi).

48. *Elaeagnus calcarea* Z. R. Xu, *Guihaia* 5: 348. 1985.

石山胡颓子 *shi shan hu tui zi*

Shrubs, semievergreen, erect, ca. 2 m tall. Spines absent; young branches densely stellate-pilose, hairs rust-colored, long-stalked, glabrescent. Petiole 6–8 mm, stellate-pilose, hairs long stipitate, rust-colored; leaf blade elliptic, 6–9 × 3–3.5 cm, papery, abaxially densely stellate-pilose particularly on veins, hairs long-stalked, white scaly when young, these lost later, adaxially densely white stellate-pilose when young, later glabrous, lateral veins 6 or 7 per side of midrib, raised abaxially and impressed adaxially, base broadly cuneate to nearly rounded, margin entire, apex acuminate. Flowers in clusters of 7–10 on very reduced shoots in axils of leaves on long shoots. Pedicel ca. 2 mm, with dense rust-colored scales. Flower ca. 8 mm overall. Calyx tube tubular, 4-ribbed, ca. 5 × 3 mm, outside with dense rust-colored or silvery scales, interior glabrous; lobes ovate-triangular, ca. 3 × 3.5 mm. Filaments very short, ca. 0.7 mm; anthers narrowly elliptic, ca. 2 mm. Style erect, slightly longer than stamens, glabrous or sparsely villous. Fruit not seen. Fl. Apr.

• Limestone hills; 800–900 m. Guizhou (Libo).

Elaeagnus calcarea is known to us only from the protologue.

49. *Elaeagnus stellipila* Rehder in Sargent, *Pl. Wilson.* 2: 415. 1915.

星毛羊奶子 *xing mao yang nai zi*

Shrubs, deciduous, to 2 m tall. Spines absent or on old branches; young branches and petioles with dense pale lacerate scales overlaid by white stellate hairs, darkening with age. Petiole 2–4 mm; leaf blade abaxially pale gray, adaxially green, broadly ovate or ovate-elliptic, 2–5.5 × 1.5–3 cm, papery, abaxially with persistent, densely overlapping white stellate hairs, adaxially with stellate hairs, ± contiguous, glabrescent, lateral veins 4 or 5 per side of midrib, raised abaxially, impressed adaxially.

ially, base rounded or shallowly cordate, margin entire, apex bluntly acute to subacuminate. Flowers often 1–3 together, each in axil of leaf at base of new shoot. Pedicel very short or absent at anthesis; fruiting pedicel 0.5–2 mm. Flowers light white, with sessile silvery stellate hairs/scales, ± contiguous at anthesis. Calyx tube obconic-tubular, faintly 4-ribbed, 5–7 mm, constricted above ovary, abruptly widening below lobes; lobes triangular-ovate or -lanceolate, 3–4.5 mm, apex acuminate. Style erect, glabrous or with sparse stellate hairs. Drupe red when ripe, narrowly ellipsoid or oblong, 1–1.6 cm, densely brown scaly. Fl. Mar–Apr, fr. Jul–Aug.

• South-facing slopes, by streams, farmland; 500–1200 m. Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan.

50. *Elaeagnus jingdongensis* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 115. 1980 [*“jingdongensis”*].

景东羊奶子 *jing dong yang nai zi*

Shrubs, deciduous or semievergreen, erect, 2–3 m tall. Spines absent; young branches with white scales overlaid with yellowish brown stipitate stellate hairs. Petiole 6–8 mm, with dark brown scales and villi; leaf blade adaxially drying dark brown, elliptic or broadly ovate-elliptic, 6–9 × 3–4.5 cm, papery, abaxially grayish white tomentose, stellate scales hair-like, overlaid by stipitate stellate scales, adaxially glabrescent, lateral veins 6–7 per side of midrib, raised abaxially, impressed adaxially, base rounded, margin entire, apex acute or abruptly acuminate. Flowers often 1–3 together, each in axil of leaf at base of new shoot. Fruiting pedicel nodding, 8–10 mm. Flowers white. Calyx tube tubular, 4–4.5 mm, conspicuously constricted above ovary; lobes ovate-triangular, ca. 5.5 mm, inside with sparse white stellate hairs, apex acute. Filaments ca. 2 mm; anthers oblong, ca. 2 mm. Drupe brown, ellipsoid to broadly fusiform, 2.2–2.5 × ca. 1.3 cm; scales dense, brown, irregularly lobed with toothed margin, also sparsely white stellate-hairy. Fl. Apr, fr. May–Jun.

• Open slopes; 2200–2300 m. C Yunnan.

51. *Elaeagnus argyi* H. Léveillé, Repert. Spec. Nov. Regni Veg. 12: 101. 1913.

佘山羊奶子 *she shan yang nai zi*

Elaeagnus chekiangensis Matsuda; *E. schnabeliana* Handel-Mazzetti.

Shrubs, deciduous or evergreen, erect, 2–3 m tall. Spines usually present; young branches light green, with dense yellowish white scales. Petiole yellowish brown, 5–7 mm; leaf blade dimorphic by season; spring leaves small, leaf blade elliptic to oblong, 1–4 × 0.8–2 cm, thinly papery or membranous, base obtuse, margin entire, apex rounded or obtuse; autumn leaves larger, leaf blade oblong-obovate or broadly elliptic, 6–10 × 3–5 cm, abaxially white with brown dots, scales overlapping, mostly white, a few brown, margin fimbriate-lacerate to ± stellate, adaxially tomentose when young, indumentum of stellate hairs, not appressed, lateral veins 8–10 per side of midrib, deeply impressed adaxially in old leaves. Flowers often 5–7 in a fascicle at base of new growing branches. Pedicel ca. 3 mm, slender;

fruiting pedicel 8–10 mm, slender. Flowers yellow, thick, with silvery and light yellow scales. Calyx tube funnelliform-tubular, 5.5–6 mm; lobes ovate-triangular, ca. 2 mm, inside with sparse short villi, apex acute. Filaments very short; anthers ellipsoid, ca. 1.2 mm. Style erect, glabrous. Drupe red when ripe, obovoid-oblong, 1.3–1.5 × ca. 0.6 cm, densely silvery scaly. Fl. Jan–Mar, fr. Apr–May.

• Forests, also cultivated; 100–300 m. Anhui, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang.

Elaeagnus argyi is cultivated in China for its edible fruits.

52. *Elaeagnus micrantha* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 116. 1980.

小花羊奶子 *xiao hua yang nai zi*

Shrubs, deciduous or semievergreen, erect, 2–3 m tall. Spines not seen; young branches with dense yellowish brown scales. Petiole 7–10 mm, with yellowish green scales similar to those of adaxial leaf surface; leaf blade abaxially light green, adaxially brownish green when dried, elliptic or oblanceolate, 5–8.5 × 2–3.5 cm, papery, abaxially with ± contiguous to separate grayish white scales, scales shallowly umbonate, shallowly erose-fimbriate, sometimes also with a few stellate hairs, adaxially with scales deeply divided or forming stellate hairs, soon lost, lateral veins 4–6 per side of midrib, slender and inconspicuous, base obtuse or rounded, margin entire, apex acuminate. Flowers often 3–6 in dense axillary cluster. Pedicel 3–5 mm. Flowers light brown or white, small, outside with overlapping brown and white scales, hairs absent, scales not umbonate, irregularly shallowly lobed, shortly fimbriate. Calyx tube cupular-obconic, 3–3.5 mm, abruptly widening at base of lobes; lobes ovate or ovate-triangular, 2–2.5 mm, inside with dense stellate hairs/deeply divided scales, these not appressed. Filaments nearly absent; anthers exerted, purple, oblong, ca. 1.3 mm. Style erect, glabrous; stigma 1–2 mm. Fruit not seen. Fl. Oct–Dec.

• Open mountain slopes; 2400–2500 m. N Yunnan.

53. *Elaeagnus bambusetorum* Handel-Mazzetti, Symb. Sin. 7: 591. 1933.

竹生羊奶子 *zhu sheng yang nai zi*

Shrubs, deciduous or semievergreen, erect, many branched. Branches densely brown scaly. Petiole to 1 cm, with dense scales and stellate hairs; leaf blade adaxially dark green, lanceolate-elliptic, 7–8 × ca. 2.5 cm, leathery, abaxially with dense gray stellate hairs, adaxially glabrous, lateral veins 7–10 per side of midrib, base narrowly rounded, margin entire, apex acuminate; leaves on flowering branches small, silvery, glossy abaxially. Flowers ca. 12 in dense axillary cluster. Pedicel absent. Calyx tube tubular, ca. 5 mm, thick, inside glabrous; lobes triangular, ca. 3 mm. Stamens exerted from throat of calyx tube; filaments glabrous, ca. as long as anthers; anthers oblong, ca. 1.5 mm. Style ca. 6 mm, pilose. Fruit not seen. Fl. Mar.

• Bamboo forests; ca. 1800 m. SE Yunnan.

Elaeagnus bambusetorum is known to us only from the protologue.

54. *Elaeagnus guizhouensis* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 117. 1980.

贵州羊奶子 *gui zhou yang nai zi*

Shrubs, deciduous or semievergreen, erect, ca. 2 m tall. Branches slender, spines absent; young branches with overlapping rust-colored to dark brown scales. Petiole 1–1.2 cm, slender, indumentum as for young stems; leaf blade abaxially grayish green, adaxially dark green, broadly elliptic, 5.5–7 × 2.6–3.8 cm, papery, abaxially stellate-tomentose, hairs mostly white and subsessile, some pale brown and stipitate, sometimes with stipitate scales, adaxially glabrous, lateral veins 5–7 per side of midrib, raised abaxially, impressed adaxially, base rounded, margin narrowly revolute, apex acute. Inflorescence usually axillary along leafy shoot, sometimes terminal; raceme very reduced, to 7-flowered. Pedicel very short, ca. 1 mm or less. Flowers light white, scales mostly white with brown center. Calyx tube tubular-campanulate, 4–5 mm, conspicuously constricted above ovary, widening at base of lobes; lobes ovate-triangular, ca. 3 mm, inside glabrous or with a few stellate hairs, apex acute. Filaments very short; anthers oblong, ca. 1 mm. Style erect, slightly exerted from throat of calyx tube, glabrous. Fruit not seen. Fl. Apr.

• Bushland on eastern slopes; 400–600 m. Guizhou.

55. *Elaeagnus jiangxiensis* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 118. 1980.

江西羊奶子 *jiang xi yang nai zi*

Shrubs, deciduous or semievergreen, ca. 2 m tall. Old branches with short conic spines; young branches with dense pale to dark brown stellate hairs, many long stipitate. Petiole 5–7 mm, with stellate hairs; leaf blade abaxially grayish green, adaxially drying dull green, ovate, 3.5–6 × 2–3 cm, thickly papery, abaxially stellate-tomentose, hairs mostly white and subsessile, some pale brown and stipitate, adaxially stellate-tomentose when young, later glabrous, lateral veins 3–5 per side of midrib, inconspicuously raised abaxially, deeply impressed adaxially, base rounded, margin entire, apex acuminate. Flowers often 1–7, subumbellate, in axils of long shoots and 2–8 in a shortened raceme on short branches. Fruiting pedicel with sessile scales and scattered shortly stipitate hairs, 1.5–1.8 cm. Flowers white, with white and brown stellate hairs. Calyx tube ca. 9.5 mm; lobes ovate-oblong, ca. 5.5 × 3 mm, with sparse white stellate hairs. Filaments very short; anthers oblong, ca. 1.3 mm. Style erect, glabrous. Immature drupe narrowly elliptic, 1–1.2 cm; scales dense, brown, irregularly lobed with toothed margin, also sparsely stipitate-hairy. Fl. Apr, fr. Jun.

• By streams in valleys. Jiangxi.

56. *Elaeagnus courtoisii* Belval, Bull. Soc. Bot. France 80: 97. 1933 [*"courtoisi"*].

毛木半夏 *mao mu ban xia*

Shrubs, deciduous, erect, 1–3 m tall. Spines absent; young branches, leaves, and flowers with dense yellow stellate hairs. Petiole 2–5 mm, with yellow villi; leaf blade abaxially gray-

white, adaxially drying green, blades at base of new shoots small, 1–2 × ca. 0.5 cm, blades at upper parts oblanceolate or obovate, 4–9 × 1–4 cm, papery, abaxially with scales overlapping, silvery white, regularly deeply fimbriate, mixed with fewer larger stellate hairs/very deeply divided scales, adaxially with very few stellate scales on base of midrib, lateral veins 6–8 per side of midrib, base equilateral or cuneate, margin entire, apex acute or obtuse. Flowers solitary in axils of new shoots. Pedicel 3–5 mm; fruiting pedicel thicker toward apex, 3–4 cm. Flowers yellowish white, with dense yellowish villi. Calyx tube tubular, ca. 5 mm, slender; lobes ovate-triangular, 3–4 mm, inside with sparse white stellate hairs, apex acute. Filaments very short, ca. 0.5 mm; anthers oblong, ca. 1 mm. Style erect, yellow, glabrous, not exerted beyond stamens. Drupe red, ellipsoid or oblong, ca. 1 cm × 2–3 mm. Fl. Feb–Mar, fr. Apr–May.

• Open areas; 300–1100 m. Anhui, Hubei, Jiangxi, Zhejiang.

57. *Elaeagnus umbellata* Thunberg in Murray, Syst. Veg., ed. 14, 164. 1784.

牛奶子 *niu nai zi*

Elaeagnus convexolepidota Hayata; *E. coreana* H. Léveillé; *E. crispa* Thunberg; *E. crocea* Nakai; *E. fragrans* Nakai; *E. higoensis* Nakai; *E. longipes* A. Gray var. *crispa* (Thunberg) Maximowicz; *E. obovata* H. L. Li; *E. parvifolia* Wallich ex Royle; *E. salicifolia* D. Don ex Loudon; *E. umbellata* var. *coreana* (H. Léveillé) H. Léveillé; *E. umbellata* f. *parvifolia* (Wallich ex Royle) Kitamura; *E. umbellata* subsp. *parvifolia* (Wallich ex Royle) Servettaz; *E. umbellata* var. *parvifolia* (Wallich ex Royle) C. K. Schneider.

Shrubs, deciduous, erect with branchlets spreading. New branches and buds silvery scaly. Petiole 3–5(–10) mm; leaf blade obovate, 2.2–5.5(–8) × 1–1.6(–2.5) cm, papery, abaxially densely white scaly, adaxially sparsely scaly when young, lateral veins 5–8 per side of midrib, base cuneate, apex acute to obtuse. Flowers 1–3(–7)-fasciculate in axils of both long and short shoots; pedicel 3–6(–8) mm, to 1.2 cm in fruit. Flowers silvery white. Calyx tube funnel-shaped, 5–7 mm, slender; lobes triangular-ovate, 2.8–3 mm. Filaments ca. 0.7 mm; anthers elliptic, 1.8–2 mm. Style 6–7 mm, with stellate hairs; stigma ca. 2.2 mm. Drupe red, nearly globose, (6–)8–9 mm. Seed ca. 7 mm. Fl. Apr–May, fr. Jul–Aug. $2n = 28^*$.

Thickets; (100–)500–3000 m. Gansu, Hubei, Jiangsu, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Japan, Korea, Nepal; naturalized in North America].

58. *Elaeagnus magna* (Servettaz) Rehder in Sargent, Pl. Wilson. 2: 411. 1915.

银果牛奶子 *yin guo niu nai zi*

Elaeagnus umbellata Thunberg subsp. *magna* Servettaz, Bull. Herb. Boissier, sér. 2, 8: 383. 1908.

Shrubs, deciduous, erect, 1–3 m tall. Spines present; young branches, flower parts, and fruit densely silvery scaly. Petiole 4–8 mm, densely white scaly; leaf blade abaxially glossy and

grayish white, adaxially drying brownish to olive-green, obovate-oblong or obovate-lanceolate, 4–10 × 1.5–3.7 cm, papery or membranous, abaxially with overlapping silvery and sometimes scattered yellowish scales, scales umbonate, shallowly lobed, margin fimbriate, adaxially with scattered silvery sessile scales, scales fimbriate, only slightly lobed, lateral veins 7–10 per side of midrib, base cuneate, margin entire, apex bluntly acute to acuminate. Flowers 1–3 at base of new grown shoots. Pedicel very short or absent at anthesis; fruiting pedicel erect, silvery, 4–6 mm (or nearly absent in gatherings from Jiangxi), thick. Flowers silvery white, densely scaly. Calyx tube tubular, 8–10 mm, abruptly constricted above ovary; lobes ovate or ovate-triangular, 3–4 mm, inside glabrous, apex acuminate. Filaments very short; anthers oblong, ca. 2 mm. Style erect, glabrous or with white stellate hairs; stigma oblique, 2–3 mm. Drupe pink-red, cylindrical or narrowly elliptic to fusiform, 1.2–1.6 cm, scales similar to those of leaves but more shortly and coarsely fimbriate. Fl. Apr–May, fr. Jun.

• Sandy soil in mountains, by roads, forest margins, or river banks; 100–1200 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan.

59. *Elaeagnus nanchuanensis* C. Y. Chang, Fl. Sichuan. 1: 464. 1981.

南川牛奶子 *nan chuan niu nai zi*

Shrubs, deciduous, erect, to 5 m tall. Spines thick; young branches and fruit with dense rust-colored or brown scales. Petiole 4–8 mm, with rust-colored or brown scales; leaf blade drying somewhat blackish, abaxially mottled brown, broadly elliptic or oblanceolate, 4–8 × 1.8–3.5 cm, papery, abaxially with overlapping scales, scales with brown center and pale, irregularly shallowly divided, toothed margins, adaxially with light white scales while young, scales similar to abaxial scales, lateral veins 6–8 per side of midrib, obscure, base rounded or cuneate, margin entire, apex obtuse to acuminate. Flowers often 5–7 in axillary clusters or along very short shoot. Pedicel very short or absent; fruiting pedicel 3–9 mm, thick. Flowers brown, inside yellow, outside with overlapping brown or yellow scales; scales shallowly lobed, subentire, inside completely glabrous. Calyx tube tubular-campanulate, 5–6 mm, conspicuously constricted above ovary, with sparse white stellate hairs or narrow pilose ring around throat; lobes broadly ovate, 2–4(–6) mm, inside yellow. Filaments very short, ca. 0.3 mm; anthers oblong, 1–1.6 mm. Style straight, ca. 8 mm, usually glabrous. Drupe red, ellipsoid, 1.2–1.6 × ca. 0.8 cm; scales dense, silvery brown, irregularly shallowly lobed. Fl. Apr–May, fr. Jun–Jul.

• Eastern slopes, streamsides; 700–1600 m. Chongqing, N Guizhou, Sichuan.

60. *Elaeagnus wushanensis* C. Y. Chang, Fl. Sichuan. 1: 465. 1981.

巫山牛奶子 *wu shan niu nai zi*

Shrubs, deciduous, erect, 3–5 m tall. Spines absent or sparse; older stems blackish, glabrous; young branches densely brown scaly. Petiole yellowish brown, 3–5 mm; leaf blade abaxially silvery white, adaxially drying light green, elliptic or ovate-

elliptic, 3.3–8.5 × 1.3–3.3 cm, papery or membranous, abaxially with rust-colored speckles when older, scales overlapping, margins shallowly lacerate/fimbriate, adaxially with scales somewhat persistent, lateral veins ca. 7 per side of midrib, slightly raised on both surfaces of older leaves, base rounded or obtuse, margin entire, apex acuminate to obtuse. Flowers 1–3 in axils of new leaves. Pedicel ca. 3 mm, scaly; fruiting pedicel 8–16 mm, thick. Flowers white. Calyx tube tubular-obconic, 4-angled, 5–6 mm; lobes triangular, 3–4 mm, inside glabrous, apex acute. Filaments ca. 0.7 mm; anthers elliptic, ca. 1.2 mm. Style erect, glabrous or with sparse stellate hairs; stigma ca. 3 mm. Drupe red, narrowly ellipsoid, 1.2–1.4 cm, with dense rust-colored scales. Fl. Apr–Jul, fr. Aug–Sep.

• Eastern edges of forests, roadsides; 1400–2300 m. Chongqing, W Hubei, S Shanxi, NE Sichuan.

61. *Elaeagnus multiflora* Thunberg in Murray, Syst. Veg., ed. 14, 163. 1784.

木半夏 *mu ban xia*

Shrubs or small trees, deciduous. Young branches rust-colored scaly. Petiole 4–6 mm, brown scaly; leaf blade elliptic or ovate to obovate-oblong, 3–10 × (1–)1.2–5 cm, abaxially with densely overlapping white and scattered pale brown scales, scales shallowly umbonate, subentire, adaxially stellate-pilose while young, lateral veins 5–7 per side of midrib, base obtuse to cuneate (especially at flowering time), apex obtuse to acute or bluntly acuminate. Flowers 1(or 2) in axil. Pedicel 4–8 mm; fruiting pedicel pendulous, 1.5–5 cm, slender. Flowers densely white and sparsely brown scaly. Calyx tube cylindrical to funnelform-cylindrical, 5–10 mm, constricted at base; lobes broadly ovate, 4–5.5 mm, apex abruptly acute. Filaments very short; anthers ca. 1 mm. Style glabrous. Drupe oblong, ovoid, or ellipsoid, 1.2–1.4 cm. Fl. Apr–May, fr. Jun–Jul.

Thickets and open woodland in lowlands and mountains; near sea level to 1800 m. Anhui, Fujian, S Guangdong, Guizhou, Hebei, Henan, Hubei, Jiangsu, Jiangxi, Shandong, Shanxi, Sichuan, Zhejiang [Japan, Korea].

Elaeagnus multiflora is a common and variable species that is often cultivated, both for its edible fruit and as an ornamental shrub.

- 1a. Calyx tube 8–10 mm 61d. var. *siphonantha*
 1b. Calyx tube 5–7 mm.
 2a. Fruit ovoid; calyx tube
 funnelform-cylindrical 61c. var. *obovoidea*
 2b. Fruit ellipsoidal; calyx tube cylindrical.
 3a. Calyx lobes broadly ovate;
 young stems relatively robust,
 scales rust-colored and
 pale brown 61a. var. *multiflora*
 3b. Calyx lobes ovate, reflexed;
 young stems relatively slender;
 scales silvery 61b. var. *tenuipes*

61a. *Elaeagnus multiflora* var. *multiflora*

木半夏(原变种) *mu ban xia (yuan bian zhong)*

Elaeagnus edulis Siebold ex Carrière; *E. longipes* A. Gray;

E. multiflora var. *edulis* (Siebold ex Carrière) C. K. Schneider; *E. odoratiedulis* Lavallée; *E. sativa* Dippel.

Calyx tube funnellform-cylindric, 5–6.5 mm. Drupe ellipsoid.

Thickets and open woodland in lowlands and mountains. Anhui, Fujian, Guizhou, Hebei, Jiangxi, Shandong, Shanxi, Sichuan, Zhejiang [Japan].

61b. *Elaeagnus multiflora* var. *tenuipes* C. Y. Chang, Fl. Sichuan. 1: 466. 1981.

细枝木半夏 xi zhi mu ban xia

Leaf adaxially with few subentire scales, soon glabrous, apex long acuminate to bluntly caudate. Calyx tube cylindric, 5–6.5 mm. Drupe ellipsoidal.

- About 1800 m. Sichuan (Emei Shan).

61c. *Elaeagnus multiflora* var. *obovoidea* C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 119. 1980.

倒果木半夏 dao guo mu ban xia

Calyx tube cylindric, 5–6.5 mm. Drupe obovoid.

• Near sea level to 200 m. Anhui, Henan, Hubei, Jiangsu, Jiangxi, Zhejiang.

61d. *Elaeagnus multiflora* var. *siphonantha* (Nakai) C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 120. 1980.

长萼木半夏 chang e mu ban xia

Elaeagnus siphonantha Nakai, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 61: 85. 1925 [“1924”]; *E. umbellata* Thunberg var. *siphonantha* (Nakai) Handel-Mazzetti.

Calyx tube 8–10 mm, relatively slender.

100–600 m. S Guangdong [Japan, Korea].

62. *Elaeagnus angustata* (Rehder) C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 121. 1980.

狭叶木半夏 xia ye mu ban xia

Shrubs, deciduous, erect, 2–4 m tall. Spines absent or on old branchlets; young branches with dense rust-colored or dark brown scales. Petiole rust-colored, 3–5 mm; leaf blade adaxially drying green or dark green, early leaves elliptic, late ones lanceolate or oblong-lanceolate, 3–9 × 1.2–2.2 cm, papery or membranous, abaxially with overlapping silvery scales, scales mostly white, a few pale brown, varying from irregularly shallowly lobed, almost subentire, to deeply lacerate-fimbriate, adaxially with white stellate hairs/deeply lacerate scales or overlapping shallowly bowl-shaped scales when young, ± glabrescent, lateral veins 7–10 per side of midrib, slightly raised on both surfaces, base rounded or slightly obtuse, margin entire, slightly undulate, apex acuminate. Flowers 1–3 in a shortened raceme. Pedicel brown, 5–8 mm; fruiting pedicel light white, 1.5–2.5 cm, slender. Flowers nodding, light white, outside densely silvery scaly. Calyx tube tubular, 4-angular, 4–5 mm; lobes broadly ovate. Filaments ca. 0.6 mm; anthers oblong, ca. 1.5 mm. Style erect, with dense stellate hairs; stigma exerted

beyond stamens. Drupe red, ellipsoid, ca. 1.4 × 0.5 cm, densely scaly. Fl. Apr–May, fr. Jul–Aug.

- Along forest streams, mountain scrub; 2100–3100 m. SW and W Sichuan, N Yunnan.

1a. Leaf blade adaxially drying green, scales deeply lacerate to stellately divided 62a. var. *angustata*

1b. Leaf blade adaxially drying dark green, scales shallowly bowl-shaped 62b. var. *songmingensis*

62a. *Elaeagnus angustata* var. *angustata*

狭叶木半夏(原变种) xia ye mu ban xia (yuan bian zhong)

Elaeagnus multiflora Thunberg f. *angustata* Rehder in Sargent, Pl. Wilson. 2: 413. 1915.

Leaf blade adaxially drying green, scales deeply lacerate to stellately divided.

- Along forest streams; 2100–3100 m. SW and W Sichuan.

62b. *Elaeagnus angustata* var. *songmingensis* W. K. Hu & H. F. Chow ex C. Y. Chang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 1980(6): 121. 1980.

嵩明木半夏 song ming mu ban xia

Leaf blade adaxially darker, with overlapping scales similar to those on abaxial surface; scales often shallowly bowl-shaped, not so persistent. Fl. Apr–May, fr. Jul–Aug.

- Mountain scrub; 2400–3000 m. N Yunnan.

63. *Elaeagnus tarokoensis* S. Y. Lu & Yuen P. Yang, Fl. Taiwan, ed. 2, 3: 785. 1993.

太鲁阁胡颓子 tai lu ge hu tui zi

Shrubs, scandent or erect, 1–3 m tall. Young branches and buds silvery brown scaly. Petiole 3–5 mm; leaf blade abaxially silvery, adaxially dark green, elliptic, 2–5 × 1–2.5 cm, thin leathery, adaxially with scattered persistent scales, lateral veins 5 or 6 per side of midrib, base acute to obtuse, apex acute to obtuse. Flowers solitary in axils of long shoots or 2–5 in a shortened raceme on short branches. Pedicel much shorter than calyx tube; fruiting pedicel shorter than fruit. Flowers white. Calyx tube 3.5–4.5 mm; lobes triangular-ovate, 3–3.5 mm. Filaments ca. 0.4 mm; anthers elliptic, ca. 1.2 mm. Style glabrous; stigma 3–3.5 mm, glandular-papillate. Drupe orange-pink, broadly ellipsoid to nearly globose, 8–10 mm. Seed 8-ribbed, 7–9 mm.

- Thickets; 300–900 m. E Taiwan (Hualian).

64. *Elaeagnus formosensis* Hatusima, J. Jap. Bot. 27: 211. 1952.

蓬菜胡颓子 peng lai hu tui zi

Elaeagnus ohashii T. C. Huang, nom. illeg. superfl.

Shrubs, scandent. Young branches and buds silvery brown scaly. Petiole 8–12 mm; leaf blade adaxially green, abaxially only slightly paler than adaxial surface, broadly elliptic to orbicular, 4–8 × 2.5–6 cm, leathery, abaxially glabrescent, midrib flat, lateral veins 6 or 7 per side of midrib, apex obtuse to rounded. Flowers solitary, rarely paired, sometimes somewhat

crowded on short, lateral, flowering shoots. Pedicel ca. as long as calyx. Flowers yellow. Calyx tube 7–8 mm; lobes triangular-ovate, 4–6 mm. Filaments 1.8–2 mm; anthers narrowly elliptic, 2.2–2.5 mm. Stigma 2–3 mm, glandular-papillate. Drupe pale red, broadly ellipsoid to ellipsoid, 1.8–2 cm. Seed 1.6–1.8 cm.

- Very rare, in thickets; 100–1000 m. S Taiwan.

Elaeagnus ohashii was published as a nomen novum on the incorrect assumption that *E. formosensis* had to be treated as a later homonym of *E. formosana*.

65. *Elaeagnus grandifolia* Hayata, Icon. Pl. Formosan. 9: 90. 1920.

慈恩胡颓子 ci en hu tui zi

Shrubs, scandent. Young branches and buds densely silvery brown scaly. Petiole 8–13 mm; leaf blade broadly elliptic to elliptic, 6–12 × 3–6 cm, leathery, lateral veins 5 or 6 per side of midrib, base cuneate to obtuse, margin narrowly revolute, apex acute. Flowers solitary in axils of long shoots and in a shortened raceme on short branches. Fruiting pedicel pendulous, slender. Flowers silvery brown. Calyx tube 6–6.5 mm; lobes triangular-ovate, 3–3.5 mm. Filaments ca. 0.8 mm; anthers elliptic, 1.4–1.5 mm. Style 5–6 mm, glabrous; stigma glandular-papillate. Drupe red, broadly ellipsoid to ellipsoid, 1.6–1.8 cm. Seed ca. 1.6 cm.

- Thickets; 700–2000 m. Taiwan (central mountains).

The apparent earlier homonym "*Elaeagnus grandifolia*" (Schlechter in A. Candolle, Prodr. 14: 612. 1857) was not validly published because it was merely cited as a synonym of *E. conferta*, even though it was associated with a potentially validating description.

66. *Elaeagnus triflora* Roxburgh, Fl. Ind., ed. 1832, 1: 439. 1832.

菲律宾胡颓子 fei lü bin hu tui zi

Elaeagnus philippinensis Perrottet [“*philippensis*”].

Shrubs, scandent. Young branches and buds silvery brown.

Petiole 6–11 mm; leaf blade ovate, elliptic, or nearly orbicular, 5–12 × 4–6 cm, papery, lateral veins 5–8 per side of midrib, base obtuse or rounded, apex acute. Flowers solitary in axils of long shoots and 2–5 in a shortened raceme. Fruiting pedicel pendulous, slender. Flowers white. Calyx tube cup-shaped, ca. 3.5 mm; lobes triangular-ovate. Filaments ca. 0.5 mm; anthers elliptic, ca. 1.5 mm. Style 2–2.5 mm, glabrous. Drupe broadly ellipsoid to ellipsoid, 1.8–2 cm. Seed 1.6–1.9 cm.

Thickets, very rare. Taiwan (Lan Yu) [Indonesia, Malaysia, New Guinea (including New Britain), Philippines; Australia (N Queensland)].

67. *Elaeagnus ovata* Servettaz, Bull. Herb. Boissier, sér. 2, 8: 384. 1908.

卵叶胡颓子 luan ye hu tui zi

Shrubs, ?deciduous; spines absent. Older branches brownish gray, glabrous; young branches reddish brown. Petiole 2.5–3 mm, silvery; leaf blade ovate or suborbicular, 2–2.5 × 1.3–1.5 cm, thinly leathery, abaxially silvery with scattered reddish scales, adaxially drying green, with scattered silvery scales, margin undulate. Flowers solitary, erect, or 1–3 on very short shoots. Perianth silvery white; tube very short, obscurely 4-angled, ca. 2.5 mm; lobes triangular, ca. 2.5 mm, interior sparsely stellate pilose. Filaments almost absent. Style incurved at apex, hardly as long as anthers, sparsely pubescent. Fruit not seen.

- Shanghai.

Elaeagnus ovata is known only from the type gathering made in Shanghai in 1879. It is easily separated from other members of the genus by the small leaves with undulate margins and the erect flowers with an obscurely 4-angled perianth tube only ca. 2.5 mm. The flowers resemble most closely those of another E Chinese species, *E. oldhamii*, but that plant has evergreen leaves, whereas *E. ovata* is described as deciduous, though the leaves are described as thinly leathery which is usually much more typical of evergreen species. *Elaeagnus ovata* has been overlooked in accounts of the plants of Shanghai and of Jiangsu suggesting that it might no longer be extant.

2. HIPPOPHAE Linnaeus, Sp. Pl. 2: 1023. 1753.

沙棘属 sha ji shu

Rhamnoides Miller.

Shrubs or trees, deciduous, dioecious, spiny. Leaves alternate, opposite, or whorled, subsessile to petiolate, blade margin entire. Flowers unisexual, clustered at base of lateral shoots. Male flowers in small catkins that appear before the leaves; calyx segments 2, membranous, free; stamens 4; disk small. Female flowers in small racemes, appearing with the leaves; calyx tubular, 2-lobed; style stigmatic on one side. Drupe globose, ellipsoid, or cylindric, sometimes longitudinally ribbed. Seed enclosed in parchmentlike endocarp, sometimes difficult to separate from seed. $2n = 24$.

Seven species: from NW Europe to E Asia, with a center of diversity on the Qinghai-Xizang plateau, most species associated with seasonally moist situations; seven species (four endemic) in China.

There has been uncertainty in the taxonomy of this genus, reflected in the range of treatments from that of Avdeyev (Izv. Akad. Nauk Tadzh. SSR, Biol. Nauk 4(93): 11–17. 1983), who recognized only one species with two subspecies, to Bartish et al. (Syst. Bot. 27: 41–54. 2002), who suggested on the basis of both morphological and molecular data that there is a good case for recognizing seven species plus a total of ten further subspecies. This latter view is accepted here. Flowering material is relatively rarely collected and the following key is based largely on fruiting material.

- 1a. Shrub 0.1–0.5(–1) m tall; leaves mostly in whorls of 3, to 2 cm, abaxially with mostly subentire peltate scales 7. *H. tibetana*
- 1b. Shrub or tree (0.6–)2–10 m tall; leaves mostly alternate, sometimes opposite, ca. 3.5 cm or more, abaxially with stellate hairs and/or deeply divided scales.

- 2a. Fruit globose to ovoid, smooth.
- 3a. Abaxial leaf surface gray with clearly distinct reddish brown midrib 2. *H. salicifolia*
- 3b. Abaxial leaf surface uniformly silvery white, sometimes with scattered reddish brown scales.
- 4a. Abaxial leaf surface with scales only; seed coat glossy, usually easily detached from endocarp at maturity 1. *H. rhamnoides*
- 4b. Abaxial leaf surface with hairs; seed coat mat, fused with endocarp 3. *H. gyantsensis*
- 2b. Fruit ± cylindric, with 3–7 longitudinal ribs or ridges.
- 5a. Plant with distinctly flattened crown; fruit distinctly curved 6. *H. neurocarpa*
- 5b. Plant with rounded or irregular crown; fruit straight.
- 6a. Most plants with some leaves opposite; abaxial leaf surface with scales only; fruit with 3–5 small ridges 5. *H. goniocarpa*
- 6b. Leaves always alternate; abaxial leaf surface with both scales and hairs; fruit with 5–7 small ridges 4. *H. litangensis*

1. Hippophaë rhamnoides Linnaeus, Sp. Pl. 2: 1023. 1753.

沙棘 sha ji

Elaeagnus rhamnoides (Linnaeus) A. Nelson; *Rhamnoides hippophaë* Moench.

Shrubs or trees, 1–15(–18) m tall. Bark brownish green, yellowish brown, or black; branches many, spines 2–7 cm. Leaves alternate; petiole ± absent; leaf blade abaxially silvery white suffused with brown or yellow, adaxially dark grayish green, linear or linear-lanceolate, 2–8 × 0.2–0.8 cm, ± narrowed at base, abaxially with white and brown stellate scales, margin ± revolute, apex subobtusate. Male inflorescence a minute spike, 5–8 × 4–6 mm. Male flowers: calyx lobes greenish brown, ovate-orbicular, 3–4 × 3–3.5 mm, concave, outside with numerous brown and sparse white stellate scales; stamens 1/2–2/3 as long as calyx; anthers nearly sessile, oblong-linear, ca. 1.5 mm. Female flowers 2–5 in axils of branchlets; pedicels ca. 0.5 mm, to 5 mm in fruit; calyx brown, tubular, oblong-obovate, 2.5–4 × 1–1.5 mm, outside with stellate brown and few white scales, lobes obtuse, interior with rather long white hairs, dense in upper part; Ovary globose-ovoid, 1–2 mm, ca. 1/2 as long as calyx, glabrous; style ca. 0.5 mm; stigma oblong, 0.5–1 mm, exserted. Peduncle 1–7 mm. Fruit orange or reddish, globose, ovoid, globose-ovoid, or ellipsoid, terete, 4–9(–10) × 3–8 mm, glabrous, succulent and aromatic. Endocarp easy to separate from seed. Seed dark brown, sometimes nearly black, glossy, ovoid-oblong, or oblong-ellipsoid, 4–7 × 1.5–2 or 4–5 mm. Fl. Apr–May, fr. Sep–Oct. *2n* = 24*.

River banks and terraces, dry river beds, forest margins, thickets on mountain slopes, moraines, meadows at highest elevations; 600–4200 m. Gansu, Hebei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, N and SE Xizang, Yunnan [Afghanistan, India, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, Europe].

Hippophaë rhamnoides subsp. *rhamnoides* is found in coastal N Europe, from France and Ireland east to the E Baltic. There are a further three subspecies recognized from Europe and C and SW Asia.

- 1a. Young stems silvery; spine-tipped shoots many, often with short lateral spines; leaf blade 2–4(–5) mm wide 1c. subsp. *turkestanica*
- 1b. Stems dull grayish or brownish; spine-tipped shoots often few, rarely with lateral spines; leaf blade (3–)4–16 mm wide.
- 2a. Leaves mostly opposite or subopposite, with few or no rust-colored hairs 1e. subsp. *sinensis*

- 2b. Leaves mostly alternate, occasionally subopposite on vigorous shoots, often with rust-colored hairs or scales.
- 3a. Leaf blade 5–8.5 × 0.6–1.6 cm, margin usually ± sinuous; flower buds whorled 1a. subsp. *wolongensis*
- 3b. Leaf blade 3–6 × 0.5–1 cm, margin not sinuous; flower buds spirally arranged.
- 4a. Leaf blade abaxially dirty gray with many rust-colored peltate hairs 1d. subsp. *yunnanensis*
- 4b. Leaf blade abaxially silvery white, rarely with scattered rust-colored stellate hairs 1b. subsp. *mongolica*

1a. Hippophaë rhamnoides subsp. **wolongensis** Y. S. Lian et al., Novon 13: 200. 2003.

卧龙沙棘 wo long sha ji

Shrubs or trees, 3–5 m tall. Older branches dark brown; new shoots red-brown. Leaves mostly alternate, occasionally subopposite on vigorous shoots; petiole 2–4 mm; leaf blade elliptic-lanceolate, 5–8.5 × 0.6–1.6 cm, abaxially with gray peltate scales, mostly divided to ca. 1/2 radius, adaxially initially scaly but glabrescent, becoming green, base cuneate, margin ± sinuate, apex acute or acuminate. Male inflorescence 5–11-flowered; female inflorescence 5–7-flowered, buds ± whorled, outside reddish brown scaly. Peduncle 3–5 mm. Fruit yellow, subglobose, 4–6 × 4.5–6(–7) mm. Seed obovoid to oblong, 3–4 × ca. 1.5 mm. Fr. Sep–Oct.

- Mountain slopes; 1600–2000 m. Sichuan.

1b. Hippophaë rhamnoides subsp. **mongolica** Rousi, Ann. Bot. Fenn. 8: 210. 1971.

蒙古沙棘 meng gu sha ji

Shrubs, to 2.5(–6) m tall. Older branches often rough, twisted; branches dull grayish or brownish; lateral spines slender, usually unbranched. Leaves alternate; leaf blade abaxially silvery white, adaxially green or slightly silvery, narrowly oblanceolate to elliptic, 4–6 × 0.5–0.8 mm, abaxially rarely with scattered rust-colored stellate hairs, base cuneate to attenuate, apex subobtusate. Peduncle 1–4 mm. Fruit globose or nearly so,

6–9 × 5–8 mm. Seed flattened ellipsoid, 3.8–5.1 mm. Fr. Sep. $2n = 24$.

Xinjiang [Mongolia, Russia].

1c. Hippophaë rhamnoides subsp. **turkestanica** Rousi, Ann. Bot. Fenn. 8: 208. 1971.

中亚沙棘 zhong ya sha ji

Shrubs or small trees, to 6(–15) m tall. Branches with glossy white epidermis peeling off with age, lateral spines usually branched, very many. Leaves alternate; leaf blade usually silvery on both surfaces, adaxially sometimes green, linear, 1.5–4.5 × 0.2–0.5 cm, rust-colored hairs absent, base cuneate, apex subobtusate. Peduncle 3–4(–7) mm. Fruit red to yellow, subglobose to broadly ellipsoid or obovoid, 5–7(–9) × 3–5 mm when dried. Seed usually somewhat flattened, 2.8–4.2 mm.

River terraces, dry river beds, occasionally on moraines or open mountain slopes; 600–4200 m. Xinjiang, N Xizang [Afghanistan, India, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, Turkmenistan, Uzbekistan].

1d. Hippophaë rhamnoides subsp. **yunnanensis** Rousi, Ann. Bot. Fenn. 8: 213. 1971.

云南沙棘 yun nan sha ji

Hippophaë salicifolia D. Don subsp. *yunnanensis* (Rousi) Hyvönen.

Shrubs or trees, 2–12 m tall. Trunk to 30 cm in diam.; bark dark gray, longitudinally fissured; branches rough, nearly black; new shoots with dense reddish brown stellate hairs; lateral spines relatively few, stout. Leaves alternate; leaf blade abaxially dirty gray, adaxially green, narrowly lanceolate, 3–6 × 0.6–1 cm, abaxially with many rust-colored peltate hairs. Peduncle 1–2 mm. Fruit usually yellow, 5–7 × 5–7 mm. Seed strongly flattened. 3–3.9 mm.

• Sandy or stony river terraces, forest margins, thickets on mountain slopes, occasionally in meadows at highest elevations; 2200–3700 m. W Sichuan, SE Xizang, Yunnan.

1e. Hippophaë rhamnoides subsp. **sinensis** Rousi, Ann. Bot. Fenn. 8: 212. 1971.

中国沙棘 zhong guo sha ji

Hippophaë rhamnoides var. *procera* Rehder; *H. salicifolia* D. Don subsp. *sinensis* (Rousi) Hyvönen.

Shrubs or trees, 1–15(–18) m tall. Trunk to 30 cm in diam.; bark brownish; branches nearly black, rough; lateral spines relatively few, stout. Leaves mostly opposite or subopposite; leaf blade abaxially usually silvery, adaxially green, narrowly lanceolate, 3–6 cm × 6–10 mm, rust-colored hairs absent. Peduncle 1–2 mm. Fruit yellow to deep red, 4–6 × 4–6 mm. Seed somewhat flattened, 2.8–4 mm.

• Open sunny habitats on river banks, dry river beds, forest margins or thickets on mountain slopes; 800–3600 m. Gansu, Hebei, Nei Mongol, Qinghai, Shaanxi, Shanxi, W Sichuan.

2. Hippophaë salicifolia D. Don, Prodr. Fl. Nepal. 68. 1825.

柳叶沙棘 liu ye sha ji

Elaeagnus salicifolia (D. Don) A. Nelson; *Hippophaë rhamnoides* Linnaeus subsp. *salicifolia* (D. Don) Servettaz.

Shrubs or trees, 2–3(–10) m tall. Trunk to more than 30 cm in diam. Petiole 2–3 mm; leaf blade abaxially whitish with usually reddish brown midrib, adaxially ± green, linear-oblong, 4.2–6.2 × 0.6–1.2 cm, abaxially tomentose, adaxially stellate-hairy, margin usually revolute. Male flowers 2.5–3(–4) mm; anthers 2–2.5 mm. Female calyx ca. 2 mm. Peduncle 1–4 mm. Fruit orange-yellow to greenish brown or yellow to deep red, globose, terete, 5–7 × 5–7 mm. Endocarp easy to separate from seed. Seed broadly ellipsoid to ovoid, ± flattened, 2.8–5.2 mm. Fl. Jun, fr. Oct.

Moist gravel or stony areas, often beside rivers or streams; 2800–3500 m. S Xizang [Bhutan, N India, Nepal].

The leaves of *Hippophaë salicifolia* are used to make tea; the fruit is used for polishing gold and silver.

3. Hippophaë gyantsensis (Rousi) Y. S. Lian, Acta Phytotax. Sin. 26: 235. 1988.

江孜沙棘 jiang zi sha ji

Hippophaë rhamnoides Linnaeus subsp. *gyantsensis* Rousi, Ann. Bot. Fenn. 8: 214. 1971.

Shrubs or trees, 5–8 m tall. Branches brown or grayish, rather long, slender. Leaves alternate; petiole ± absent; leaf blade abaxially uniformly dull white, adaxially green or slightly silvery, linear-oblong or linear-lanceolate, (1.2–)3.5–5.5 × 0.3–0.5 cm, abaxially ± tomentose, with or without rust-colored stellate hairs, adaxially hairy, base cuneate, margin slightly revolute, apex acute. Peduncle ca. 2 mm. Fruit ellipsoid, terete, 5–7 × 3–5 mm. Endocarp difficult to separate from seed. Seed flattened ellipsoid, ca. 4.5 mm, surface mat, slightly furrowed. Fr. Sep.

• Gravelly river terraces and dried river beds; 3500–4000(–5000) m. Xizang.

4. Hippophaë litangensis Y. S. Lian & Xue L. Chen ex Swenson & Bartish, Syst. Bot. 27: 52. 2002.

理塘沙棘 li tang sha ji

Shrubs or small trees. Young shoots hairy; lateral spines unbranched. Leaves alternate; leaf blade linear, abaxially hairy, white scaly, margin revolute. Fruit yellow to red, cylindrical, with 5–7 small ridges, 6–8 mm. Seed straight, longitudinally ridged.

• Hillsides; ca. 3700 m. Sichuan (Litang).

Molecular data support the suggestion by Lian et al. (Proceedings of International Workshop on Seabuckthorn, 60–66. 1995) that this taxon might have originated from hybridization between *Hippophaë neurocarpa* subsp. *stellatopilosa* and *H. rhamnoides* subsp. *yunnanensis*.

5. Hippophaë goniocarpa Y. S. Lian et al. ex Swenson & Bartish, Syst. Bot. 27: 52. 2002.

棱果沙棘 leng guo sha ji

Shrubs or small trees, to 7 m tall. Bark white; branches (sub)glabrous, lateral spines unbranched. Leaves alternate or opposite; leaf blade abaxially white, margin flat, abaxially with

scales only. Fruit yellow to red, cylindric, with 3–5 small ridges, 6–10 mm. Seed straight, longitudinally ridged.

- River banks and terraces; 2500–3500 m. Qinghai, Sichuan.

Lian et al. (Proceedings of International Workshop on Seabuckthorn, 60–66. 1995) suggest that this taxon is of hybrid origin (*Hippophaë neurocarpa* × *H. rhamnoides* subsp. *sinensis*) but it is uniform over a number of localities and produces fully fertile seeds, and thus merits treatment as a full species.

6. *Hippophaë neurocarpa* S. W. Liu & T. N. He, Acta Phytotax. Sin. 16(2): 107. 1978.

肋果沙棘 lei guo sha ji

Shrubs or dwarf trees, usually flat-topped, 0.6–3.5 m tall. Leafy stems slender, unbranched, spine tipped. Leaves alternate; leaf blade abaxially silvery, 2–6(–8) × 0.2–0.4 cm, margin revolute or flat. Fruit brown or yellowish red, ± cylindric, distinctly curved, with 5–7 ribs, 5.5–8(–9) × 3–4 mm, silvery scaly. Endocarp difficult to separate from seed. Seed cylindric, curved, 4–6 mm, surface mat, longitudinally ridged. $2n = 24^*$.

- Valley bottoms, flood plains, river banks and terraces; 3400–4400 m. Qinghai, Sichuan, Xizang.

The flat-topped habit and obviously curved fruit make *Hippophaë neurocarpa* very easy to identify.

- 1a. New shoots with scales only; leaf margin narrowly revolute; fruit brown 6a. subsp. *neurocarpa*
 1b. New shoots pilose, hairs caducous; leaf margin flat; fruit red to yellow 6b. subsp. *stellatopilosa*

6a. *Hippophaë neurocarpa* subsp. *neurocarpa*

肋果沙棘(原亚种) lei guo sha ji (yuan ya zhong)

Hippophaë rhamnoides Linnaeus subsp. *neurocarpa* (S. W. Liu & T. N. He) Hyvönen.

New shoots nearly white, with scales only. Leaf blade margin revolute, abaxially with scales only. Fruit brown, 6–8(–9) mm.

- Valley bottoms, flood plains; 3400–4000 m. Qinghai, Sichuan, Xizang.

6b. *Hippophaë neurocarpa* subsp. *stellatopilosa* Y. S. Lian et al. ex Swenson & Bartish, Syst. Bot. 27: 52. 2002.

密毛肋果沙棘 mi mao lei guo sha ji

New shoots pilose, glabrescent. Leaf blade abaxially with long hairs, margin flat. Fruit red to yellow, 5.5–6.5 mm.

- River banks and terraces; 3400–4400 m. Sichuan, Xizang.

7. *Hippophaë tibetana* Schlechtendal, Linnaea 32: 296. 1864.

西藏沙棘 xi zang sha ji

Hippophaë rhamnoides Linnaeus subsp. *tibetana* (Schlechtendal) Servettaz.

Shrubs, small, sometimes rhizomatous, (5–)10–60(–80) cm tall. Older stems dark gray, thick, with regularly spaced scars of deciduous leafy branches; leafy stems slender, unbranched, spine tipped. Leaves mostly in whorls of 3; petiole ca. 1 mm; leaf blade abaxially whitish, adaxially grayish, linear-oblong, 1.2–2 × 0.25–0.4 cm, densely scaly, abaxially with scattered subentire, reddish brown scales and reddish brown midrib, margin flat. Male flowers ca. 2 mm; anthers ca. 1.5 mm. Peduncle 1–2 mm. Fruit yellowish green, globose to elliptic, terete, 8–11 × 6–9 mm. Endocarp difficult to separate from seed. Seed somewhat flattened, 4–5.6 × 1.9–2.8 mm. Fr. May. $2n = 24^*$.

Dry gravelly or stony places, especially on riverbeds and flood plains; 3600–4700 m. Gansu, Qinghai, Xizang [Bhutan, N India, Nepal].

The distinctively whorled leaves of *Hippophaë tibetana* seem to have been overlooked by previous authors.