

## 12. ATRIPLEX Linnaeus, Sp. Pl. 2: 1052. 1753.

滨藜属 bin li shu

Herbs annual or perennial, subshrubs, or shrubs, usually furfuraceous. Leaves alternate, rarely opposite, petiolate or sessile; leaf blade flattened, slightly succulent, linear, lanceolate, oblong, ovate, triangular, rhombic, or hastate, margin serrate, rarely entire. Flowers unisexual (plants monoecious or dioecious), borne in axillary glomerules arranged in panicles or short, leafy spikes. Male flowers ebracteate; perianth (3–)5-parted; segments oblong or obovate, apex obtuse; stamens 3–5, inserted at base of perianth; filaments usually united proximally; ovary rudimentary, conic or terete, rarely obsolete. Female flowers: bractlets 2, free or margins connate to varying lengths, slightly enlarged in fruit (here termed “fruiting bracts”), shape various, both sides usually with appendages; perianth and disk absent; ovary ovoid or globose; style very short; stigmas 2, subulate or filamentous. Utricle enclosed by fruiting bracts; pericarp adnate to seed. Seed vertical, compressed, compressed globose, or lenticular; testa membranous, leathery, or crustaceous; embryo annular; radicle lateral or superior; perisperm surrounded by embryo.

About 250 species: temperate and subtropical zones; 17 species (two introduced) in China.

- 1a. Subshrubs or shrubs; leaf blade margin entire.
  - 2a. Shrubs; flowers borne in short, leafy, spikelike inflorescences (Hainan) ..... 3. *A. repens*
  - 2b. Subshrubs; flowers borne in terminal, leafless panicles (Xinjiang).
    - 3a. Leaves opposite, leaf blade rhomboid to obovate-lanceolate; fruiting bracts tuberculate on surfaces ..... 1. *A. verrucifera*
    - 3b. Leaves alternate, leaf blade oblanceolate to linear; fruiting bracts without appendages ..... 2. *A. cana*
- 1b. Herbs annual; leaf blade margin ± serrate.
  - 4a. Fruiting bracts orbicular, margin entire.
    - 5a. Plants with male flowers and 2-bracteate female flowers; fruiting bracts of 2 sizes ..... 6. *A. micrantha*
    - 5b. Plants with bisexual flowers (or stamens undeveloped and flowers appearing female) and 2-bracteate female flowers; fruiting bracts all of same size.
      - 6a. Fruiting bracts acute at apex; leaves scarcely furfuraceous (cultivated) ..... 4. *A. hortensis*
      - 6b. Fruiting bracts rounded or slightly emarginate at apex; leaves densely furfuraceous ..... 5. *A. aucheri*
  - 4b. Fruiting bracts not orbicular, margin ± toothed.
    - 7a. Leaves green, without Kranz anatomy.
      - 8a. Leaf blade more than 2 × as long as wide, linear, or lanceolate to narrowly oblong.
        - 9a. Fruiting bracts rhombic to ovate-rhombic, furfuraceous, margins united to middle ..... 7. *A. patens*
        - 9b. Fruiting bracts ovate-lanceolate to subcordate, scarcely furfuraceous, margins united only basally .... 8. *A. laevis*
      - 8b. Leaf blade up to 2 × as long as wide.
        - 10a. Leaf blade subglabrous, margin entire ..... 9. *A. fera*
        - 10b. Leaf blade furfuraceous, margin ± toothed.
          - 11a. Leaf blade base hastate to subtruncate; perianth of male flowers yellow ..... 10. *A. prostrata*
          - 11b. Leaf blade base cuneate; perianth of male flowers green ..... 11. *A. patula*
    - 7b. Leaves gray-green, with Kranz anatomy.
      - 12a. Fruiting bracts covered with thornlike appendages, only distal margins free ..... 12. *A. sibirica*
      - 12b. Fruiting bracts appendaged near base at center or without appendages.
        - 13a. Flowers glomerulate, axillary throughout plant.
          - 14a. Leaf margins sparsely serrate; fruiting bracts flabellate, with soft, thornlike, tuberculate appendages ..... 13. *A. centralasiatica*
          - 14b. Leaves entire, or with a pair of obtuse lobes near base; fruiting bracts cordate to sagittate, appendage a 3-parted process ..... 14. *A. dimorphostegia*
        - 13b. Flowers axillary and forming distinct, spikelike inflorescences on upper branches; fruiting bracts without appendages or with a few irregular, tuberculate appendages.
          - 15a. Herbs annual (W China) ..... 17. *A. tatarica*
          - 15b. Herbs perennial (coasts of Fujian and Taiwan).
            - 16a. Fruiting bracts shortly stalked, margins triangular serrate ..... 15. *A. maximowicziana*
            - 16b. Fruiting bracts sessile, margins finely repand dentate ..... 16. *A. nummularia*

**1. *Atriplex verrucifera*** Marschall von Bieberstein, Fl. Taur.-Caucas. 2: 441. 1808.

疣苞滨藜 liu bao bin li

*Atriplex glauca* Pallas (1771), not Linnaeus (1763);  
*Halimione verrucifera* (Marschall von Bieberstein) Aellen;

*Obione verrucifera* (Marschall von Bieberstein) Moquin-Tandon.

Subshrubs, 20–50 cm tall. Stems dwarf, woody; branches terete, bark light yellow to gray-brown; annual branches erect or decurrent, ribbed, slightly striate, densely furfuraceous, usually unbranched, or with axillary branchlets shorter than

leaves. Leaves opposite (except several leaves beneath inflorescence alternate), shortly petiolate; leaf blade usually suberect, yellow-greenish to silver-gray, rhombic-ovate, or elliptic to obovate-lanceolate, 3–5 × 0.8–2.5 cm, densely furfuraceous on both surfaces, base attenuate, margin entire, apex obtuse or acute. Inflorescences terminal, interrupted panicles. Male flowers: perianth segments 5; stamens 5; ovary rudimentary, cylindrical. Fruiting bracts shortly pedicellate, connate almost to apex, subglobose, 2–3 mm in diam., fleshy, both sides with tuberculate appendages. Utricle yellow-brown to brown; pericarp adnate to seed. Seed vertical, compressed, orbicular, 1.5–2 mm in diam. Fl. Jun–Aug, fr. Aug–Sep.

Saline and alkaline wastelands, inter-dunes, roadsides. N Xinjiang [W Mongolia, Russia (W Siberia); C and SW Asia (Iran), S Europe].

**2. *Atriplex cana*** C. A. Meyer in Ledebour, Icon. Pl. 1: 11. 1829.

白滨藜 bai bin li

Subshrubs, 20–50 cm tall, sometimes somewhat cushion-shaped. Stems much branched, woody, bark gray-brown, lacinate; annual branches erect, usually slightly zigzagged, 15–30 cm, terete, slightly ribbed, branched above. Leaves alternate, lower ones sometimes subopposite, shortly petiolate; leaf blade narrowly oblong, or oblanceolate to linear, 1–3 cm × 2–7 mm, densely silver-white furfuraceous on both surfaces, base attenuate, margin entire, apex obtuse; veins obscure. Inflorescences terminal panicles on annual branches. Male flowers: perianth segments 5; stamens 5. Fruiting bracts connate only at base, slightly compressed, densely furfuraceous on both surfaces, sometimes with a few tuberculate processes, margins with 3 obtuse teeth distally. Utricle compressed globose; pericarp light yellowish, membranous, adnate to seed. Seed vertical, dark red-brown, 1.5–2.25 mm in diam., slightly punctate. Fl. Jul–Oct, fr. Sep.

Semideserts, arid slopes, lake shores. N Xinjiang [Kazakhstan, Russia (SW Siberia); SW Asia (Caucasus), SE Europe].

**3. *Atriplex repens*** Roth, Nov. Pl. Sp. 377. 1821.

匍匐滨藜 pu fu bin li

*Obione koenigii* Moquin-Tandon.

Shrubs small, 20–50 cm tall. Stems decumbent or prostrate, often rooting; branches alternate, light green, sometimes reddish purple, slightly ribbed. Leaves alternate; petiole 1–3 mm; leaf blade obovate to ovate, 1–2 × 0.8–1.5 cm, fleshy, densely gray-green furfuraceous on both surfaces, base broadly cuneate to rounded, margin entire, apex rounded or obtuse. Inflorescences short, leafy spikes on upper branches. Male flower: perianth subulate, 4- or 5-parted; segments obovate, apically inflexed; stamens 4 or 5; filaments flattened, basally united; rudimentary ovary absent. Fruiting bracts connate only near base, triangular to ovate-rhombic, basal central part yellow-white, inflated, corky, each side of midline with an antrorse process, margins irregularly serrate. Utricle compressed ovoid; pericarp membranous. Seed red-brown to black, ca. 1.5 mm. Fr. Dec–Jan.

Open sandy areas on beaches. E Hainan [Afghanistan, India; SE Asia].

**4. *Atriplex hortensis*** Linnaeus, Sp. Pl. 2: 1053. 1753.

榆钱菠菜 yu qian bo cai

Herbs annual, to 2 m tall, slightly furfuraceous. Stem erect, stout; branches oblique or spreading, obtusely 4-angled, green striate. Petiole 1–3 mm; leaf blade green on both surfaces, ovate-oblong to ovate-triangular, 5–25 × 3–18 cm, adaxially slightly furfuraceous, base hastate to broadly truncate, margin entire or irregularly serrate, apex subobtuse. Inflorescences axillary and terminal panicles with bisexual and female flowers mixed in glomerules. Bisexual flowers ebracteate; perianth 5-parted; segments oblong; stamens 5, sometimes undeveloped and flowers appearing female; seed horizontal, lenticular, 1.5–2 mm in diam.; testa black, sublustrous, thinly leathery. Female flowers bracteate; perianth absent; fruiting bracts very shortly petiolate, connate only at base, suborbicular, 1–1.5 cm in diam., both surfaces reticulate veined and glabrous, base truncate or slightly emarginate, margins entire, apex acute; seed vertical, compressed globose, 3–4 mm in diam.; testa yellow-brown, not lustrous, usually membranous. Fl. and fr. Aug–Sep.

Cultivated. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi [native to SW Asia and Europe; introduced and cultivated in many regions of the world].

The young plants are used as a vegetable in N China.

**5. *Atriplex aucheri*** Moquin-Tandon, Chenop. Monogr. Enum. 51. 1840.

野榆钱菠菜 ye yu qian bo cai

*Atriplex amblyostegia* Turczaninow; *A. hortensis* Linnaeus subsp. *desertorum* (Iljin) Aellen; *A. nitens* Schkuhr subsp. *desertorum* Iljin.

Herbs annual, 30–90 cm tall. Stem erect, terete below, slightly 4-angled above, simple or with a few branches above; branches slender, obliquely spreading, furfuraceous. Petiole 1–3 cm; leaf blade triangular-hastate to triangular-lanceolate, 4–10 × 2–8 cm, abaxially densely gray-white furfuraceous, adaxially dark green and not furfuraceous, base cordate to broadly cuneate, margin serrate or serrately lobed (usually 2nd pair of teeth from base elongated), sometimes subentire, apex usually obtuse. Inflorescences terminal panicles. Bisexual flowers ebracteate; perianth 5-parted; segments linear-oblong; stamens 5 (or undeveloped and flowers appearing female); seed horizontal, depressed globose, ca. 1.5 mm in diam.; testa black, sublustrous, thinly leathery. Female flowers bracteate; perianth absent; fruiting bracts sessile, free, broadly ovate to oblong, 6–10 mm, reticulate veined and furfuraceous on both surfaces, margin entire, apex rounded or emarginate; seed vertical, usually compressed globose, 3–4 mm in diam.; testa yellow-brown, not lustrous, membranous. Fl. and fr. Aug–Oct.

Gobi desert, deserts, arid valleys. Xinjiang [Afghanistan, Kazakhstan, Turkmenistan; SW Asia (Caucasus, Iran), SE Europe (SE European Russia, SE Ukraine)].

*Atriplex sagittata* Borkhausen (Rhein. Mag. Erweit. Naturk. 1: 477. 1793; *A. nitens* Schkuhr), another species of *A. sect. Atriplex* closely related to *A. aucheri* and *A. hortensis*, has occasionally been reported from China, as *A. nitens*. In most cases these records were

based on misidentifications. However, it is possible that *A. sagittata* does indeed occur in western regions of China as a native species, or can be expected to occur elsewhere as an introduced species.

**6. *Atriplex micrantha*** C. A. Meyer in Ledebour, Icon. Pl. 1: 11. 1829.

异苞滨藜 yi bao bin li

*Atriplex hastata* Linnaeus var. *heterocarpa* Fenzl; *A. heterosperma* Bunge.

Herbs annual, 50–120 cm tall. Stem erect, ribbed, slightly furfuraceous, usually branched above middle. Petiole 0.5–1.5 cm; leaf blade triangular to hastate, 2–6 × 1.5–5 cm, abaxially densely gray furfuraceous, or both surfaces same color, base cuneate to broadly so, margin entire or coarsely serrate, with a pair of lobes near base, apex obtuse or acute. Inflorescences terminal panicles. Male flower: perianth 5-parted; stamens 5. Fruiting bracts connate at base, orbicular or suborbicular, furfuraceous when young, entire at margins, of 2 types: small fruiting bracts 1.5–2 mm; seed lenticular, ca. 0.5 mm in diam.; testa black, sublustrous, leathery; large fruiting bracts 3–4.5 mm in diam.; seed compressed globose, 2–3 mm in diam.; testa yellow-brown, not lustrous, membranous. Fl. Jun–Aug, fr. Aug–Sep.

Moist saline and alkaline places, lake shores, meadows, deserts. N Xinjiang [Kazakhstan, Russia (W Siberia); SW Asia, SE Europe; introduced in North America].

**7. *Atriplex patens*** (Litvinov) Iljin, Izv. Glavn. Bot. Sada SSSR 26: 415. 1927.

滨藜 bin li

*Atriplex littoralis* Linnaeus var. *patens* Litvinov, Sched. Herb. Fl. Ross. 5: 12. 1905; *A. laevis* C. A. Meyer var. *patens* (Litvinov) Grubov; *A. littoralis* subsp. *stepposa* Kitagawa.

Herbs annual, 20–60 cm tall. Stem erect or decumbent, slightly furfuraceous, ribbed and striate, branched above; branches slender, obliquely spreading. Leaves alternate or basal ones subopposite; leaf blade lanceolate to linear, 2–9 × 0.5–1 cm, both surfaces green and glabrous or slightly furfuraceous, base attenuate, margin irregularly curved serrate, sometimes subentire, apex subobtuse or acuminate. Inflorescences terminal, spicate or with short branches, usually forming a dense panicle. Male flowers: perianth 4- or 5-parted; stamens 4 or 5. Fruiting bracts connate below middle, rhombic to ovate-rhombic, ca. 3 × 2.5 mm, furfuraceous, sometimes distally with tuberculate processes, margins usually finely serrate distally, apex acute or shortly acuminate. Seeds of 2 types: black or red-brown, depressed globose or lenticular, 1–2 mm in diam., finely punctate. Fl. and fr. Aug–Oct.

Slightly saline or alkaline moist meadows, beaches, sandy places. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Xinjiang [Russia (SE European part, Far East, S Siberia); C and SW Asia, SE Europe].

*Atriplex patens* is closely related to *A. laevis* and is sometimes treated as a variety of that species.

**8. *Atriplex laevis*** C. A. Meyer in Ledebour, Icon. Pl. 1: 10.

1829.

光滨藜 guang bin li

Herbs annual, 20–30 cm tall. Stem erect, green striate, subglabrous; lower branches opposite, elongate, obliquely spreading. Leaves shortly petiolate; leaf blade linear to narrowly oblong, 2–5 cm × 3–8 mm, both surfaces green and glabrous, base attenuate, apex acute. Flowers axillary, glomerulate, forming a loose, spikelike inflorescence on upper stem and branches. Fruiting bracts connate only near base, ovate-triangular to subcordate, 3–8 × 3–6 mm, without appendages, scarcely furfuraceous, base broadly cuneate to subtruncate, margins entire or sparsely serrate, with 1–3 pairs of serrate teeth near base, apex acute or acuminate. Seed compressed, lenticular, 1.5–2.5 mm. Fl. and fr. Aug–Oct.

Moist meadows. Nei Mongol, N Xinjiang [Mongolia, Russia (SE European part, SE Siberia); C and SW Asia, SE Europe].

**9. *Atriplex fera*** (Linnaeus) Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, 27(8): 6. 1880.

野滨藜 ye bin li

*Spinacia fera* Linnaeus, Sp. Pl., ed. 2, 2: 1456. 1763; *Obione fera* (Linnaeus) Moquin-Tandon; *S. divaricata* Turczaninow ex Moquin-Tandon.

Herbs annual, 20–80 cm tall. Stem erect or decumbent, 4-angled or terete below, ribbed, green striate, usually branched throughout; branches slender, obliquely spreading, slightly furfuraceous. Petiole 6–12 mm; leaf blade ovate-oblong to ovate-lanceolate, 2–7 × 0.8–2 cm, both surfaces gray-green, base cuneate to broadly so, margin entire, rarely with 1 to several pairs of undulate, obtuse teeth, apex obtuse or shortly acuminate. Inflorescences of axillary glomerules. Male flowers 4-merous. Female flowers 3–10 per glomerule. Fruiting bracts connate throughout, inflated, ovoid or cylindrical, hardened, with prominent, reticulate veins and 1 or 2 irregularly placed, thorny processes on both sides, apex with 3 short teeth; pedicel 3–4 mm. Utricle compressed globose; pericarp white, membranous, adnate to seed. Seed vertical, brown, 1.5–2 mm in diam.; radicle superior. Fl. and fr. Jul–Sep.

Lake shores, river banks, canyon sides, field margins, roadsides. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Qinghai, Shaanxi, Shanxi, Xinjiang [Mongolia, Russia (SE Siberia)].

**10. *Atriplex prostrata*** Boucher ex Candolle in Lamarck & Candolle, Fl. Franç., ed. 3, 3: 387. 1805.

戟叶滨藜 ji ye bin li

*Atriplex latifolia* Wahlenberg; *A. microsperma* Waldstein & Kitaibel.

Herbs annual, to 1 m tall. Stem erect, usually stout, terete, ribbed, green striate, subglabrous; branches cylindrical, obliquely spreading. Leaves alternate or subopposite; petiole 1–3 cm; leaf blade triangular-hastate, 5–10 × 4–10 cm, abaxially slightly furfuraceous, adaxially glabrous, base slightly cordate or subtruncate, margin irregularly serrate or with 1–3 pairs of unequal, serrate lobes below middle, apex acute or acuminate. Inflorescences spikelike or paniculate on upper part of stem and

branches. Male flower: perianth yellow, subglobose, 5-parted; stamens 5. Fruiting bracts connate only at base, rhombic to ovate-triangular, densely furfuraceous, margins usually entire. Utricle ca. 1.2 mm; pericarp yellow-white, adnate to seed. Seed black, sublustrous, compressed globose. Fl. Jul–Aug, fr. Sep–Oct.

Moist valley meadows, roadsides. N Xinjiang [N Africa, C and SW Asia, Europe; naturalized in many other regions of the world].

The rejected name *Atriplex hastata* Linnaeus was often misapplied to this species. The name *A. hastata* in the strict sense refers to the European coastal taxon now known as *A. calotheca* (Rafn) Fries.

### 11. *Atriplex patula* Linnaeus, Sp. Pl. 2: 1053. 1753.

草地滨藜 cao di bin li

Herbs annual, to 1 m tall. Stem erect, terete below, distinctly ribbed and colored striate above, densely furfuraceous, much branched above; branches obliquely spreading. Petiole 5–12 mm; leaf blade ovate-triangular to lanceolate, 4–6 × 1–3 cm, abaxially usually gray-white furfuraceous, base broadly cuneate, margin irregularly serrate on middle cauline leaves, with a pair of larger teeth near base, entire on lower and upper cauline leaves or with only 1 pair of teeth near base, apex shortly acuminate. Inflorescence laxly spikelike. Male flowers: perianth green, 4- or 5-parted; segments oblong, slightly fleshy; stamens 4 or 5; anthers broadly obovate, ca. 3 mm. Female flowers: ovary ellipsoid; stigmas filiform, ca. 3 mm. Fruiting bracts connate only near base, ovate to ovate-triangular, 2–5 mm, densely furfuraceous, margins entire, apex obtuse or acute. Utricle compressed subglobose; pericarp membranous. Seed red-brown or black, 1.5–2.5 mm in diam.; testa membranous or crustaceous. Fl. and fr. Aug–Oct.

Slopes. W Xinjiang; should be expected as naturalized in other parts of China [Asia, Europe, North America; also widely naturalized].

*Atriplex oblongifolia* Waldstein & Kitaibel (Descr. Icon. Pl. Hung. 3: 278. 1806–1812; *A. patula* Linnaeus var. *oblongifolia* (Waldstein & Kitaibel) Westerlund) is a distinct species related to *A. patula* and naturally occurring from Europe to SW and C Asia. Reports of *A. oblongifolia* from China need confirmation, because this species is easily confused with xeromorphic, farinose forms of *A. patula*.

### 12. *Atriplex sibirica* Linnaeus, Sp. Pl., ed. 2, 2: 1493. 1763.

西伯利亚滨藜 xi bo li ya bin li

*Obione muricata* Gaertner; *O. sibirica* (Linnaeus) Fischer.

Herbs annual, 20–50 cm tall. Stem usually branched from base; branches decumbent or obliquely spreading, obtusely 4-angled, not striate, furfuraceous. Petiole 3–6 mm; leaf blade ovate-triangular to rhombic-ovate, 3–5 × 1.5–3 cm, abaxially densely gray-white furfuraceous, adaxially gray-green and not or only slightly furfuraceous, base rounded or broadly cuneate, margin sparsely serrate, with a pair of larger teeth near base or only 1 pair of lobes and the remainder entire, apex subobtusely. Inflorescences axillary glomerules. Male flowers: perianth 5-parted; segments ovate to broadly so; stamens 5; filaments flattened, basally united; anthers broadly ovate to shortly oblong, ca. 0.4 mm. Fruiting bracts connate proximally, inflated, subobovoid, 5–6 × ca. 4 mm, woody, with numerous irregu-

lar, tuberculate processes on both sides, base cuneate, distal margins thin, serrate. Utricle ovoid or subglobose, compressed; pericarp white, membranous, adnate to seed. Seed vertical, red-brown or yellow-brown, 2–2.5 mm in diam. Fl. Jun–Jul, fr. Aug–Sep.

Saline and alkaline deserts, stabilized dunes, lake shores, canyon sides. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Xinjiang [Kazakhstan, Mongolia, Russia (Siberia); occasionally introduced in Europe].

### 13. *Atriplex centralasiatica* Iljin, Trudy Bot. Inst. Acad. Nauk SSSR, Ser. 1, Fl. Sist. Vyssh. Rast. 2: 124. 1936.

中亚滨藜 zhong ya bin li

Herbs annual, 15–30 cm tall. Stem often branched throughout; branches yellow-green, obtusely 4-angled, mostly furfuraceous. Leaves petiolate, upper ones subsessile; petiole (when present) 2–6 mm; leaf blade ovate-triangular to rhombic-ovate, 2–3 × 1–2.5 cm, abaxially densely gray-white furfuraceous, adaxially gray-green, base rounded to broadly cuneate, margin sparsely serrate, with a larger pair of lobelike teeth near base, or only 1 pair of lobes and remainder entire, apex subobtusely. Inflorescences axillary glomerules. Male flowers: perianth 5-parted; segments broadly ovate; stamens 5; filaments flattened, basally united; anthers broadly ovoid to shortly cylindrical, ca. 0.4 mm. Fruiting bracts connate near base, triangular, rhombic, or 3-lobed, 1–4(–4.5) cm, basal central part thickened, woody, both sides with numerous tuberculate appendages, margins herbaceous, narrower and subentire, or broader and triangular-denticulate; pedicel 1–3(–5) cm. Utricle broadly ovoid or globose, compressed; pericarp white, membranous, adnate to seed. Seed vertical, red-brown or yellow-brown, 2–3 mm in diam. Fl. Jul–Aug, fr. Aug–Sep.

Gobi desert, salt deserts, wastelands, beaches, sometimes in fields, field margins. Gansu, Hebei, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shanxi, Xinjiang, Xizang [Kazakhstan, Mongolia, Russia (Siberia); C Asia].

*Atriplex centralasiatica* is closely related to *A. sibirica*. Grubov (Rast. Tsentral. Azii 2: 33. 1966) proposed varietal rank for the former under the latter; however, Sukhorukov (Taxon. Chorol. Sp. Gen. *Atriplex* Russia Adjac. Countries, 2003) confirmed the specific status of *A. centralasiatica*.

- 1a. Fruiting bracts triangular or rhombic, 1.5–2 cm, margins narrower, subentire, pedicel usually less than 1.5 cm ..... 13a. var. *centralasiatica*
- 1b. Fruiting bracts mostly 3-lobed, 1–4(–4.5) cm, middle lobe larger than lateral ones, margins broader, triangular-denticulate, pedicel usually 1–3(–5) cm ..... 13b. var. *megalotheca*

### 13a. *Atriplex centralasiatica* var. *centralasiatica*

中亚滨藜(原变种) zhong ya bin li (yuan bian zhong)

*Atriplex sibirica* Linnaeus var. *centralasiatica* (Iljin) Grubov; *Obione centralasiatica* (Iljin) Kitagawa.

Fruiting bracts triangular or rhombic, 1.5–2 cm, margins narrower, subentire; pedicel usually less than 1.5 cm.

Gobi desert, salt deserts, wastelands, beaches, sometimes in fields. Gansu, Hebei, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shanxi, Xinjiang, Xizang [Mongolia, Russia (Siberia); C Asia].

**13b. *Atriplex centralasiatica* var. *megalotheca*** (Popov ex Iljin) G. L. Chu in H. W. Kung & C. P. Tsien, Fl. Reipubl. Popularis Sin. 25(2): 41. 1979.

大苞滨藜 da bao bin li

*Atriplex megalotheca* Popov ex Iljin in Shishkin, Fl. URSS 6: 873. 1936.

Fruiting bracts mostly 3-lobed, 1–4(–4.5) cm, middle lobe larger than lateral ones, margins broader, triangular-denticulate; pedicel usually 1–3(–5) cm.

Wastelands, field margins. W Gansu, S Xinjiang [Kazakhstan].

According to a new taxonomic treatment of *Atriplex* by Sukhorukov (Taxon. Chorol. Sp. Gen. *Atriplex* Russia Adjac. Countries, 2003), *A. centralasiatica* and *A. megalotheca* are treated as distinct species belonging to different sections (*A. sect. Obione* (Gaertner) C. A. Meyer and *A. sect. Sclerocalymma* Ascherson, respectively). The taxonomy of these entities is in need of revision.

**14. *Atriplex dimorphostegia*** Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 438. 1842.

犁苞滨藜 li bao bin li

*Atriplex dimorphostegia* var. *sagittiformis* Aellen.

Herbs annual, 15–30(–45) cm tall. Stem much branched; branches decumbent or obliquely spreading, not furfuraceous or upper part furfuraceous, lustrous sericeous. Leaves subsessile; leaf blade ovate, broadly so, deltoid, or cordate, succulent, 1–4(–5) × 1–3 cm, both surfaces gray-green, but abaxially often densely furfuraceous, base rounded to broadly cuneate, margin entire to shallowly irregularly sinuate-dentate, apex rounded, usually mucronulate. Inflorescences of axillary, usually 3–8-flowered glomerules. Male flowers 4- or 5-merous. Fruiting bracts connate only near base, cordate or suborbicular, furfuraceous, basal central part with prominent appendages, base emarginate, margins sparingly dentate, with green, reticulate veins, apex obtuse or acute; pedicel stout, 2–3 mm, usually thinner at base. Utricle ovoid; pericarp white, membranous, adnate to seed. Seed brown, not lustrous, compressed, ca. 1.5 mm. Fl. and fr. May–Jul.

Deserts, dunes, sandy places, alluvial fans, sometimes in fields. Xinjiang [Afghanistan, Kazakhstan, Pakistan, Turkmenistan, Uzbekistan; N Africa, SW Asia].

At least two varieties of this very polymorphic species have been recognized in China. *Atriplex dimorphostegia* var. *sagittiformis* differs from var. *dimorphostegia* in having plants usually taller (30–40 cm), leaf blade margin with a pair of lobes near the base, and fruiting bracts triangular-hastate (not cordate or suborbicular) and apically acuminate.

**15. *Atriplex maximowicziana*** Makino, Bot. Mag. (Tokyo) 10: 2. 1896.

海滨藜 hai bin li

Herbs perennial, 30–100 cm tall. Stems erect, terete, much branched; lower branches subopposite, yellow-white, slightly ribbed, not striate, furfuraceous. Leaf blade rhombic-ovate to ovate-oblong, usually 2–3 × 1–2 cm, abaxially gray-white furfuraceous, adaxially gray-green furfuraceous, base cuneate to broadly so, decurrent, margin usually 3-lobed, proximal-middle lateral lobes entire, obtuse, middle lobes repand or entire, apex obtuse or acute, mucronulate. Inflorescences axillary glomerules, forming small, reduced panicles on upper branches. Male flowers: perianth 5-parted; stamens 5. Fruiting bracts connate only at base, rhombic-ovate to triangular-ovate, without appendages, basal central part mostly thickened and corky; pedicel 1–2 mm. Utricle compressed globose or lenticular; pericarp light yellow, membranous, adnate to seed. Seed red-brown, ca. 2 mm in diam.; perisperm white, solid. Fl. and fr. Sep–Dec.

Sandy and coral-rocky seashores; near sea level. Fujian [Japan (Ryukyu Islands); naturalized in Pacific Islands (Hawaii)].

This species was recently reported as naturalized in Hawaii (Wagner et al., Bishop Mus. Occas. Pap. 48: 51–65. 1997).

**16. *Atriplex nummularia*** Lindley in T. Mitchell, J. Exped. Trop. Australia, 64. 1848.

大洋洲滨藜 da yang zhou bin li

Herbs perennial, to 2 m tall. Stems erect, much branched, slightly ribbed. Leaves shortly petiolate; leaf blade ovate to rhombic-ovate, usually 1–1.5 × 0.6–1 cm, furfuraceous, base subcuneate to broadly cuneate, decurrent, margin with 1–3 pairs of undulate teeth, or entire, apex rounded to subobtuse. Inflorescences axillary glomerules borne toward apex of branches, forming small panicles. Fruiting bracts connate at base, semi-orbicular, ca. 7 mm wide, basal central part swollen and hardened, margins green, with finely undulate teeth.

Naturalized. Taiwan (including Penghu Dao) [native to Australia].

One of us (Clemants) observes that the above description does not correspond with that of *Atriplex nummularia* given by Wilson (in George, Fl. Australia 4: 130. 1984). Among the characters that are different are: herbs (Taiwan) vs. shrubs (Australia); leaves 1–1.5 cm (Taiwan) vs. leaves 2–4 cm (Australia). The species is included in Fl. Taiwan, ed. 2, but no specimen was seen by us. The plants in Taiwan might be an aberrant form of *A. maximowicziana*.

**17. *Atriplex tatarica*** Linnaeus, Sp. Pl. 2: 1053. 1753.

鞑鞑滨藜 da da bin li

Herbs annual, 20–80 cm tall. Stem erect or decumbent, usually much branched, bark of lower stem exfoliating; branches slender, obliquely spreading. Petiole short or to 2 cm; leaf blade linear-oblong to triangular-ovate, 2–7 × 1–4 cm, abaxially densely gray-white furfuraceous, adaxially green and not furfuraceous, base cuneate to broadly so, margin irregularly serrate, sinuately lobed, remotely toothed, or entire, apex acute or shortly acuminate, with pellucid tip. Inflorescences axillary glomerules forming panicles on upper stem and branches; rachis densely furfuraceous. Male flowers: perianth obconic, 5-parted; stamens 5; anthers oblong. Fruiting bracts connate proximally, rhombic-ovate to ovate, basal central part yellow-

white with prominent veins, sometimes with a few tuberculate appendages, margins  $\pm$  dentate. Utricle ovoid or subglobose, compressed; pericarp white, membranous, adnate to seed. Seed vertical, yellow-brown to red-brown, 1.5–2.5 mm in diam.; perisperm yellow-brown, solid. Fl. and fr. Jul–Sep.

Saline and alkaline deserts, Gobi desert, wet plains, sometimes on field margins. W Gansu, N Qinghai, Xinjiang, Xizang [Mongolia, N Pakistan, Russia (Siberia); N Africa, C and SW Asia, Europe; naturalized in many other regions of the world].

- 1a. Upper cauline leaf blade oblong to triangular-ovate, margin irregularly serrate or sinuately lobed ..... 17a. var. *tatarica*
- 1b. Upper cauline leaf blade linear-oblong, oblong, or narrowly triangular, margin entire or remotely toothed ..... 17b. var. *pamirica*

### 17a. *Atriplex tatarica* var. *tatarica*

鞑靼滨藜(原变种) da da bin li (yuan bian zhong)

*Atriplex lehmanniana* Bunge; *A. multicolora* Aellen; *A. rosea* Linnaeus var. *subintegra* C. A. Meyer; *Obione graeca* Moquin-Tandon.

Upper cauline leaf blade oblong to triangular-ovate, margin irregularly serrate or sinuately lobed.

Saline and alkaline deserts, Gobi desert, wet plains, sometimes on field margins. W Gansu, N Qinghai, Xinjiang [Mongolia, Russia (Siberia); N Africa, C and SW Asia, Europe; naturalized in many other regions of the world].

**17b. *Atriplex tatarica* var. *pamirica*** (Iljin) G. L. Chu in H. W. Kung & C. P. Tsien, Fl. Reipubl. Popularis Sin. 25(2): 46. 1979.

帕米尔鞑靼滨藜 pa mi er da da bin li

*Atriplex pamirica* Iljin, Trudy Bot. Inst. Acad. Nauk SSSR, Ser. 1, Fl. Sist. Vyssh. Rast. 2: 124. 1936.

Upper cauline leaf blade linear-oblong, oblong, or narrowly triangular, margin entire or remotely toothed.

Xizang [N Pakistan; C Asia (Pamir mountains)].

*Atriplex schugnanica* Iljin (Trudy Bot. Inst. Acad. Nauk SSSR, Ser. 1, Fl. Sist. Vyssh. Rast. 2: 123. 1936), a member of *A. sect. Sclerocalymma* Aellen, is closely related to *A. rosea* Linnaeus and *A. tatarica*. It occurs in the Pamir mountains and EC Asia, and was reported by Grubov (Rast. Tsentral. Azii 2: 32. 1966) from N and W Xinjiang (Shache near the Yarkant river and other localities).

*Atriplex altaica* Sukhorukov (Feddes Repert. 111: 176. 2000), also a representative of *A. sect. Sclerocalymma*, was recently described from the Altai mountains of Russia and reported from NW China, although no exact Chinese localities were cited in the protologue. According to Sukhorukov, it is closely related to *A. pamirica* (recognized here as *A. tatarica* var. *pamirica*) and belongs to the *A. tatarica* aggregate.

