

**20. CHENOPODIUM** Linnaeus, Sp. Pl. 1: 218. 1753.

藜属 li shu

Herbs annual or perennial, rarely subshrubs, covered with vesicular or terete hairs (in several species sometimes also with uniseriate, multicellular hairs), farinose ("mealy") when dry, rarely glabrous. Leaves alternate, petiolate; leaf blade complanate, margin entire or irregularly serrate or lobed. Inflorescence usually of several flowers forming a glomerule (rarely solitary flowers), these arranged in axillary or terminal spikes, panicles, or dichasia; bracts and bractlets absent. Flowers bisexual or some female. Perianth green, globose, 5-parted, in some species (2 or)3- or 4-parted; segments abaxially slightly fleshy at center or longitudinally keeled, adaxially concave, remaining unchanged in fruit, rarely enlarged or becoming juicy, without appendages. Disk usually absent. Stamens 5 or fewer; filaments sometimes basally united, filiform or capillary; anthers oblong, without an appendage. Ovary globose, slightly depressed, rarely ovoid; ovule subsessile; style obscure or very short; stigmas 2(-5). Fruit a utricle; pericarp membranous or slightly fleshy, adnate to seed or free, indehiscent. Seed horizontal, in some species oblique and/or vertical, ovoid, lenticular, or depressed globose; testa lustrous, leathery, smooth or pitted; embryo annular, semi-annular, or horseshoe-shaped; perisperm copious, farinaceous.

About 170 species: almost worldwide, but most abundant in temperate and subtropical zones; 15 species (one introduced) in China.

- 1a. Perianth 3- or 4-parted; seeds horizontal, vertical, or oblique.
  - 2a. Flowers arranged in dense, axillary, globose inflorescences; perianth becoming red and succulent in fruit ..... 1. *C. foliosum*
  - 2b. Flowers not arranged in axillary, globose inflorescences; perianth not becoming red and succulent in fruit.
    - 3a. Perianth segments mostly united to near apex ..... 4. *C. chenopodioides*
    - 3b. Perianth segments united only at base.
      - 4a. Plants farinose; leaves grayish white abaxially ..... 2. *C. glaucum*
      - 4b. Plants glabrous to weakly farinose; leaves concolorous ..... 3. *C. rubrum*
- 1b. Perianth mostly 5-parted; seeds always horizontal (sometimes oblique or vertical in *C. urbicum* subsp. *sinicum*).
  - 5a. Leaf blade margin entire, or with a pair of simple or divided lateral lobes below middle.
    - 6a. Inflorescences shorter than leaves.
      - 7a. Leaves 1.5-3 cm; seed finely foveolate ..... 8. *C. karoii*
      - 7b. Leaves 0.5-1.5 cm; seed subsmooth ..... 9. *C. iljinii*
    - 6b. Inflorescences longer than leaves.
      - 8a. Inflorescence crowded, rachis or beneath flowers with fascicles of terete hairs; leaf blade margin narrowly pellucid; perianth mostly thickened in fruit and becoming star-shaped ..... 5. *C. acuminatum*
      - 8b. Inflorescence slender and loose, rachis without fascicles of terete hairs; leaf blade margin not pellucid; perianth not thickened in fruit.
        - 9a. Leaf blade margin with distinct, lateral lobes, sometimes lobes 2-divided; perianth segments ovate; seed radially lineate ..... 6. *C. bryoniifolium*
        - 9b. Leaf blade margin entire or with obscure, lateral lobes; perianth segments narrowly obovate to linear; seed pitted ..... 7. *C. gracilispicum*
  - 5b. Leaf blade margin ± toothed.
    - 10a. Plants glabrous throughout ..... 10. *C. urbicum*
    - 10b. Plants ± farinose.
      - 11a. Leaf blade margin palmately lobed; seed usually 2-3 mm in diam., distinctly orbicular pitted ..... 11. *C. hybridum*
      - 11b. Leaf blade margin not palmately lobed; seed less than 2 mm in diam., not orbicular pitted.
        - 12a. Plants 2-3 m tall; lower leaves to 20 cm; inflorescence pendulous ..... 12. *C. giganteum*
        - 12b. Plants usually smaller; lower leaves less than 8 cm; inflorescence not pendulous.
          - 13a. Leaf blade margin distinctly 3-lobed, middle and lateral lobes serrate; seed hexagonally pitted; perianth segments valvate in bud and remaining closed at anthesis ..... 13. *C. ficifolium*
          - 13b. Leaf blade margin not 3-lobed; seed lightly lineate; perianth segments imbricate in bud and spreading in flower.
            - 14a. Leaf blade margins nearly parallel, apex rounded or obtuse ..... 14. *C. strictum*
            - 14b. Leaf blade margins distinctly non-parallel, apex acute or acuminate ..... 15. *C. album*

**1. Chenopodium foliosum** Ascherson, Fl. Brandenburg 1: 572. 1864.

1753; *Chenopodium blitum* J. D. Hooker; *C. virgatum* (Linnaeus) Ambrosi (1857), not Thunberg (1815).

球花藜 qiu hua li

*Morocarpus foliosus* Moench, Methodus, 342. 1794, nom. illeg. superfl., based on *Blitum virgatum* Linnaeus, Sp. Pl. 1: 4.

Herbs annual, 20-70 cm tall. Stem mostly branched from base; branches erect or oblique, light green, slender, glabrous. Leaf blade of lower leaves light green on both surfaces, narrowly triangular-ovate, 2-5 × 2-3 cm, equaling or longer than

petiole, not or only slightly farinose, base cuneate, truncate, or hastate, margin irregularly dentate, apex acuminate; teeth near base slightly recurved; leaves gradually reduced on upper stem and branches, lanceolate or ovate-hastate, margin with 1–4 pairs of teeth bilaterally or entire. Flowers bisexual and female, borne on short, axillary branches, forming globose or cylindrical-globose, linear arranged glomerules. Perianth light green, usually 3-parted, becoming red and succulent in fruit. Stamens 1–3. Style very short; stigmas 2, slightly divaricate. Utricle compressed globose; pericarp membranous, adnate to seed. Seed vertical, red-brown to black, sublustrous, ca. 1 mm in diam., rim margin obtuse or slightly concave; embryo semi-annular. Fl. Jun–Jul, fr. Aug–Sep.

Forest margins, valleys, slopes. W Gansu, E and N Xinjiang [N Africa, C and SW Asia, Europe; occasionally naturalized in other regions].

The variable *Chenopodium foliosum* aggregate is represented in the mountains of C and SW Asia by several weakly differentiated and closely related races, which are often treated as separate species or at least as subspecies. Probably these entities are high-mountain subspecies or varieties of *C. foliosum* s.l. They include: (1) *C. foliosum* subsp. *montanum* Uotila (Ann. Bot. Fenn. 30: 190. 1993), reported from SW Asia eastward to Iraq and Iran; (2) *C. korshinskyi* (Litvinov) Minkwitz (in B. Fedtschenko, Rastit. Turkestana, 332. 1915; *Blitum korshinskyi* Litvinov, Trudy Bot. Muz. Imp. Akad. Nauk 7: 76. 1910), described from Tajikistan and reported from the Pamir-Alai and Karakoram mountains; and (3) *C. litwinowii* (Paulsen) Uotila (Ann. Bot. Fenn. 30: 190. 1993; *Monolepis litwinowii* Paulsen, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 6(5): 187. 1903), described from the Pamir mountains and reported from the Hindu Kush and Karakoram mountains. *Chenopodium foliosum* s.str. has stem normally erect, branches spreading, and both rather stout; leaf blade of lower leaves longer than broad, margin dentate-serrate to uppermost bracts; fruiting glomerules at least 4 mm, usually red and succulent; seed 1–1.4 mm in diam.; *C. korshinskyi* has stem and branches ascending, slender; leaf blade of lower leaves as long as broad, margin entire but for basal lobes; fruiting glomerules 2–4 mm, dry; *C. litwinowii* has stem and branches prostrate or nearly so; leaf blade of lower leaves longer than broad, margin dentate-serrate (but on upper bracts entire but for a pair of basal lobes); seed 0.8–1.2 mm in diam. Several taxa of the *C. foliosum* aggregate could be expected to occur in China. However, the taxonomic status and distributional patterns of these entities remain rather problematic and, because of that, this group in China needs additional collecting and special taxonomic studies.

## 2. *Chenopodium glaucum* Linnaeus, Sp. Pl. 1: 220. 1753.

灰绿藜 hui lü li

*Blitum glaucum* (Linnaeus) W. D. J. Koch.

Herbs annual, 20–40 cm tall. Stem decumbent or diffuse, green or purple-red striate, ribbed. Petiole 5–10 mm; leaf blade oblong-ovate to lanceolate, 2–4 × 0.6–2 cm, fleshy, abaxially gray-white farinose, sometimes slightly reddish purple, adaxially glabrous, base attenuate, margin irregularly erose to dentate (sometimes indistinctly lobed), apex acute or obtuse; midvein prominent, yellow-green. Flowers bisexual and female, usually several per glomerule, arranged on branches in spicate or paniculate inflorescences (and/or in axillary glomerules), these shorter than leaves and interrupted. Perianth segments 3 or 4,

light green, narrowly oblong or obovate-lanceolate, less than 1 mm, slightly succulent, usually not farinose, apex usually obtuse. Stamens 1 or 2; filaments not exerted from perianth; anthers globose. Stigmas 2, very short. Utricle protruding from perianth; pericarp yellow-white, membranous. Seed horizontal, oblique, or vertical, dark brown or red-brown, compressed globose, ca. 0.75 mm in diam., pitted, rim margin obtuse. Fl. and fr. May–Oct.

Fields, vegetable gardens, peripheries of villages, slightly saline-alkaline soils. Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, Yunnan [N and S temperate zones].

*Chenopodium glaucum* is a variable species represented by various forms of little or no taxonomic significance. However, throughout its extremely wide range it is also differentiated into several morphologically intergrading but geographically defined subspecies or microspecies.

*Chenopodium amurense* Ignatov (Byull. Moskovsk. Obshch. Isp. Priir., Otd. Biol. 91: 111. 1986) was described from the Amur River area of the Russian Far East. This little-known entity clearly belongs to the *C. glaucum* aggregate (as a species or subspecies), differing from *C. glaucum* s.str. by having 3-lobed leaves and distinctly spatulate perianth segments. Such plants probably also occur in NE China. It should be noted, however, that 3-lobed leaves are characteristic of the rare hybrid, *C. ×schulzeanum* Murr (*C. glaucum* × *C. rubrum*).

## 3. *Chenopodium rubrum* Linnaeus, Sp. Pl. 1: 218. 1753.

红叶藜 hong ye li

*Blitum polymorphum* C. A. Meyer, p.p.; *B. rubrum* (Linnaeus) Reichenbach.

Herbs annual, 30–80 cm tall. Stem erect or obliquely spreading, light green or reddish, obscurely striate, ribbed, glabrous; upper branches usually 2–8 cm. Leaf blade green or often red tinged on both surfaces, ovate to rhombic-ovate, 4–8 × 2–6 cm, 3–5 × as long as petiole, succulent, adaxially slightly farinose to subglabrous, base cuneate, margin serrate-dentate to lobed, rarely entire, apex acuminate; teeth in 3–5 pairs, triangular, unequal, usually slightly incurved, apex subobtuse. Flowers bisexual and female, several per glomerule, arranged in spikelike panicles on upper branches. Perianth segments 3 or 4 (or 5), green, often becoming red at maturity, obovate, abaxially slightly fleshy at center, adaxially concave, remaining unchanged in fruit, glabrous or slightly farinose. Stigmas 2, very short. Pericarp membranous, whitish, not adnate to seed. Seed vertical, oblique, or horizontal, red-black to black, globose or broadly ovoid, slightly depressed, 0.75–1 mm in diam., distinctly oblong pitted, rim margin obtuse. Fl. and fr. Aug–Oct.

Slightly saline-alkaline places. N Gansu, W Heilongjiang, Nei Mongol, Ningxia, Xinjiang [C and SW Asia, Europe, North America; naturalized in other regions].

*Chenopodium gubanovii* Sukhorukov (Feddes Repert. 110: 493. 1999) was recently described from the Mongolian Altai Mountains and reported from NE Kazakhstan, W Mongolia, and Russia (Altai and Tuva). Judging from its known distribution pattern, this species can be expected in NW Xinjiang. It differs from *C. rubrum* in having leaf blades broadly ovate to rhombic-ovate, almost entire at the margin; perianth segments oblanceolate, enlarged and distinctly keeled in fruit; and seeds with an acute rim margin. In general habit this taxon

resembles *C. chenopodioides*, but evidently differs in the aforementioned perianth and seed characters.

**4. *Chenopodium chenopodioides*** (Linnaeus) Aellen, *Ostenia* (Montevideo) 1933: 98. 1933.

合被藜 he bei li

*Blitum chenopodioides* Linnaeus, *Mant. Pl.* 2: 170. 1771; *B. polymorphum* C. A. Meyer, p.p.; *Chenopodium botryodes* Smith.

Herbs annual, 20–50 cm tall. Stem erect, much branched, green striate, ribbed, usually not farinose. Leaf blade green abaxially, dark green adaxially, broadly triangular, 3–4 cm, slightly broader than long, ca. 2 × as long as petiole, slightly succulent, glabrous or slightly farinose, base truncate or broadly cuneate, decurrent to base of petiole, margin serrate or subentire, apex obtuse or shortly acuminate. Glomerules arranged in spikelike panicles on branches; central flowers of glomerules bisexual, lateral ones female. Female flowers: perianth obconic, 2–4-lobed, succulent; lobes cochleariform, unequal, abaxially keeled. Bisexual flowers: perianth depressed hemispheric, 4- or 5-parted; stamens as many as perianth segments. Seed vertical in female flowers, horizontal in bisexual flowers, yellow-brown, sublustrous, depressed ovoid, 0.5–0.75 mm in diam., slightly pitted, rim margin obtuse; embryo annular. Fl. and fr. Aug–Sep.

Gobi desert. N Xinjiang [N Africa, C and SW Asia, Europe, North America].

The distribution of this species is insufficiently known because of confusion with *Chenopodium rubrum*. However, *C. chenopodioides* is confined to saline habitats (coastal and inland salt-marshes).

**5. *Chenopodium acuminatum*** Willdenow, *Ges. Naturf. Freunde Berlin Neue Schriften* 2: 124. 1799.

尖头叶藜 jian tou ye li

Herbs annual, 20–80 cm tall. Stem erect, much branched, green striate, sometimes reddish purple striate, ribbed; branches obliquely spreading, slender. Petiole 1.5–2.5 cm; leaf blade broadly to narrowly ovate, lanceolate, or oblong, 2–4 × 1–3 cm, abaxially ± gray-white farinose, adaxially light green and not farinose (or only moderately so), base broadly cuneate, rounded, or subtruncate, margin entire, pellucid, apex cuneate or shortly acuminate, mucronate. Glomerules arranged into dense or interrupted spikes or spikelike panicles on upper part of branches; rachis with fascicles of terete, multicellular hairs. Flowers bisexual. Perianth compressed globose, 5-parted; segments broadly ovate, mostly thickened abaxially and becoming star-shaped in fruit, reddish or yellowish farinose, margin membranous. Stamens 5; anthers ca. 0.5 mm. Utricle globose or ovoid, depressed. Seed horizontal, black, ca. 1 mm in diam., slightly pitted. Fl. Jun–Jul, fr. Aug–Sep.

River banks, lake shores, beaches, field margins, wastelands. Fujian, Gansu, Guangdong, Guangxi, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Taiwan, Xinjiang, Zhejiang [Japan, Korea, Mongolia, Russia (Siberia), NE Vietnam; C Asia].

- 1a. Leaf blade mostly ovate to broadly so, sometimes ovate-lanceolate on upper stem ..... 5a. subsp. *acuminatum*  
1b. Leaf blade narrowly ovate, lanceolate, or oblong, obviously longer than wide ..... 5b. subsp. *virgatum*

**5a. *Chenopodium acuminatum*** subsp. *acuminatum*

尖头叶藜(原亚种) jian tou ye li (yuan ya zhong)

*Chenopodium acuminatum* var. *ovatum* Fenzl; *C. album* Linnaeus var. *acuminatum* (Willdenow) Kuntze.

Leaf blade mostly ovate to broadly so, sometimes ovate-lanceolate on upper stem.

River banks, field margins, wastelands. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Xinjiang, Zhejiang [Japan, Korea, Mongolia, Russia (Siberia); C Asia].

**5b. *Chenopodium acuminatum*** subsp. *virgatum* (Thunberg) Kitamura, *Acta Phytotax. Geobot.* 20: 206. 1962.

狭叶尖头叶藜 xia ye jian tou ye li

*Chenopodium virgatum* Thunberg, *Nova Acta Regiae Soc. Sci. Upsal.* 7: 143. 1815, not (Linnaeus) Ambrosi (1857); *C. vachelii* Hooker & Arnott.

Leaf blade narrowly ovate, lanceolate, or oblong, obviously longer than wide.

Lake shores, beaches, wastelands. Fujian, Guangdong, Guangxi, Hebei, Jiangsu, Liaoning, Taiwan, Zhejiang [Japan, NE Vietnam].

This predominantly littoral and alluvial taxon is certainly of Sino-Japanese distribution and is sometimes treated as a separate species (*Chenopodium virgatum* or *C. vachelii*). However, there was much controversy regarding the taxonomic affiliation of *C. virgatum*: some authors believed that the name refers to narrow-leaved forms of the *C. album* aggregate or to *C. strictum*.

Judging from the presence of characteristic multicellular hairs (especially in the inflorescence) and leaf and inflorescence morphology, *C. acuminatum* s.l. (*C. sect. Acuminata* Ignatov) is related to the Asian perennial *C. fruticosum* C. A. Meyer, the Australian shrubby *C. auricomum* Lindley (the latter, together with the annual *C. auricomiforme* Murr, is placed in *C. sect. Auricoma* Aellen), and probably to some other shrubby species.

**6. *Chenopodium bryoniifolium*** Bunge, *Delect. Sem. Hort. Petrop.* 10. 1876.

菱叶藜 ling ye li

*Chenopodium koraiense* Nakai.

Herbs annual, 50–80 cm tall. Stem erect, much branched above, terete below, green striate and slightly obtusely ribbed above; branches obliquely spreading, slender. Petiole slender; leaf blade of lower and middle leaves ovate-triangular to ovate-rhombic, usually 3–4 × 2–3 cm, 2–3 × as long as petiole, slightly farinose abaxially, not farinose adaxially, base broadly cuneate, margin distinctly 3-lobed, apex acute; middle lobe triangular, lateral lobes near base, usually 2-toothed; upper leaves smaller, leaf blade subhastate. Glomerules borne on upper branches, arranged into slender, spikelike panicles. Flow-

ers bisexual. Perianth segments 5, slightly spreading in fruit, ovate, abaxially keeled, farinose. Pericarp dark brown, adnate to seed. Seed horizontal, black, very slightly lustrous, lenticular, 1.3–1.5 mm in diam., distinctly radially lineate. Fl. and fr. Jul–Sep.

Forest margins, meadows. Hebei, Heilongjiang, Jilin, Liaoning [Japan, Korea, Russia (Far East, SE Siberia)].

The name *Chenopodium atripliciforme* Murr (sometimes incorrectly cited as “*atriplicifolium*”) has often been treated as a synonym of *C. bryoniifolium*, or misidentified as *C. opulifolium* Schrader ex Candolle. However, *C. atripliciforme* is a separate species reported from NE Afghanistan, N India, and N Pakistan. Judging from several herbarium specimens available, it probably also occurs in the mountains of SC Asia. It may also be expected to occur in W China.

**7. *Chenopodium gracilispicum*** H. W. Kung, Acta Phytotax. Sin. 16(1): 120. 1978.

细穗藜 xi sui li

Herbs annual, 40–70 cm tall, slightly farinose. Stem erect, sparsely slender branched above, green striate, terete, ribbed. Petiole slender, 0.5–2 cm; leaf blade abaxially gray-green, adaxially fresh green, subglabrous, rhombic to ovate, 3–5 × 2–4 cm, adaxially subglabrous, base broadly cuneate, margin entire or with 2 lateral lobes near base, not pellucid, apex acute or shortly acuminate. Flowers bisexual, usually 2 or 3 per glomerule, these arranged into interrupted spikes on slender branches, forming a narrow, terminal panicle. Perianth 5-parted; segments narrowly obovate or linear, united only at base, abaxially slightly fleshy at center, keeled, margin membranous, apex obtuse. Stamens 5, inserted on base of perianth. Utricle depressed, lenticular; pericarp adnate to seed. Seed horizontal, black, sublustrous, of same shape as utricle, 1.1–1.5 mm in diam., distinctly pitted. Fl. Jul, fr. Aug.

Forest margins, slope grasslands, river banks. S Gansu, Guangdong, Hebei, Henan, Hunan, Jiangsu, Jiangxi, Shaanxi, E Shandong, Sichuan, Taiwan, Zhejiang [Japan].

The name *Chenopodium koraiense* has often been misapplied to this species but is in fact a synonym of *C. bryoniifolium*.

**8. *Chenopodium karoii*** (Murr) Aellen, Repert. Spec. Nov. Regni Veg. 26: 149. 1929.

平卧藜 ping wo li

*Chenopodium album* Linnaeus subsp. *karoii* Murr, Neu. Übers. Bl.-Pfl. Vorarlberg 1: 97. 1923; *C. prostratum* Bunge ex Herder (1889), not Roemer & Schultes (1820), nor Jacquemont ex Moquin-Tandon (1849), nor Roxburgh ex J. D. Hooker (1886); *C. prostratum* subsp. *karoii* (Murr) Lomonosova.

Herbs annual, 20–40 cm tall. Stem prostrate or obliquely spreading, much branched, green striate, terete or obtusely ribbed. Petiole 1–3 cm, slender; leaf blade abaxially pallid, adaxially gray-green, ovate to broadly so, 1.5–3 × 1–2.5 cm, abaxially densely farinose, prominently 3-veined, adaxially not or only slightly farinose, base broadly cuneate, margin usually 3-lobed, apex obtuse or acute and mucronate; central lobe margin entire, rarely slightly crenate; lateral lobes positioned near

middle of leaf blade, margin obtuse and entire. Flowers several per glomerule, these arranged on branchlets into axillary panicles shorter than leaves. Perianth segments (4 or)5, usually closed in fruit, ovate, abaxially slightly keeled, margin yellowish, membranous, apex obtuse. Stamens as many as perianth segments; anthers exerted at anthesis. Stigmas 2(or 3), filiform. Pericarp yellow-brown, membranous, adnate to seed. Seed horizontal, black, sublustrous, lenticular, 1–1.2 mm in diam., finely pitted. Fl. and fr. Aug–Sep.

Mountains, often around livestock corrals, wastelands, around houses, vegetable gardens; 1500–4000 m. W Gansu, N Hebei, Qinghai, NW Sichuan, Xinjiang, Xizang [Mongolia, Russia (Far East, Siberia); C Asia].

This species is closely related to *Chenopodium iljinii* and the C Asian *C. pamiricum* Iljin on the one hand, and to *C. bryoniifolium* on the other.

**9. *Chenopodium iljinii*** Goloskokov, Bot. Mater. Gerb. Bot. Inst. Komarova Acad. Nauk SSSR 13: 65. 1950.

小白藜 xiao bai li

*Chenopodium bryoniifolium* Bunge var. *kapelleriae* Aellen ex Iljin.

Herbs annual, 10–30 cm tall, farinose throughout. Stem usually prostrate or obliquely spreading, much branched, sometimes branched only from base. Petiole slender, 0.4–1 cm; leaf blade gray-green, ovate to ovate-triangular, usually 0.5–1.5 × 0.4–1.2 cm, farinose on both surfaces, base broadly cuneate, margin entire or 3-lobed, apex subobtuse or acute; lateral lobes attached near base of leaf blade, apex obtuse. Glomerules forming short spikes on axillary branchlets. Perianth segments (4 or)5, obovate-linear to oblong, not keeled, abaxially densely farinose. Filaments slightly shorter than perianth; anthers broadly oblong. Style obscure; stigmas 2, filiform. Utricle depressed. Seed horizontal, rarely oblique, black, sublustrous, lenticular, sometimes depressed ovoid, 0.8–1.2 mm in diam., subsmooth or slightly pitted. Fl. and fr. Aug–Oct.

Valley terraces, slopes, drier grasslands; 2000–4000 m. W Gansu, Ningxia, Qinghai (Qilian Shan), NW Sichuan, Xinjiang [Kazakhstan].

The closely related, C Asian *Chenopodium pamiricum* Iljin (in Shishkin, Fl. URSS 6: 873. 1936) may be expected to occur in the mountains of W China. Probably some Chinese records of *C. iljinii* refer to that species.

**10. *Chenopodium urbicum*** Linnaeus, Sp. Pl. 1: 281. 1753.

市藜 shi li

Herbs annual, 20–100 cm tall, not farinose (but young leaves and inflorescence rachis sometimes slightly tomentose). Stem erect, branched or unbranched, striate, ± stout, ribbed. Petiole 2–4 cm; leaf blade concolorous, triangular or rhombic-ovate, 3–8 cm (lower ones sometimes to 15 cm), narrower than or as wide as long, slightly succulent, base subtruncate or broadly cuneate, margin irregularly serrate, apex acute or acuminate. Glomerules few or many flowered, forming axillary or terminal, erect, spikelike panicles. Flowers bisexual and female. Perianth segments 3–5. Filaments slightly shorter than perianth;

anthers oblong. Utricle lenticular; pericarp brown. Seed horizontal, oblique, or vertical, red-brown to black, sublustrous, 0.5–1 mm in diam., obscurely or obviously pitted, rim margin obtuse or acute. Fl. and fr. Jul–Oct.

Gobi desert, wastelands, saline-alkaline places, field margins. Hebei, Heilongjiang, N Jiangsu, Jilin, Liaoning, Nei Mongol, N Shaanxi, Shandong, Shanxi, N Xinjiang [N Africa, C and SW Asia, Europe; introduced in North America and some other regions].

- 1a. Leaf blade triangular, 3–8 cm; glomerules few flowered, forming axillary, spikelike panicles; perianth segments 5; seed horizontal, ca. 1 mm in diam., obscurely pitted, rim margin obtuse ..... 10a. subsp. *urbicum*
- 1b. Leaf blade rhombic-ovate, lower ones to 15 cm; glomerules many flowered, forming mainly terminal, spikelike panicles; perianth segments 3–5; seed horizontal, oblique, or vertical, 0.5–0.7 mm in diam., obviously pitted, rim margin acute ..... 10b. subsp. *sinicum*

**10a. *Chenopodium urbicum* subsp. *urbicum***

市藜(原亚种) shi li (yuan ya zhong)

Leaf blade triangular, 3–8 cm, margin irregularly serrate. Glomerules few flowered, forming axillary, spikelike panicles. Perianth segments 5. Seed horizontal, ca. 1 mm in diam., obscurely pitted, rim margin obtuse. Fl. Aug–Sep, fr. Oct.

Gobi desert, field margins. N Xinjiang [N Africa, C and SW Asia, Europe; introduced in North America and some other regions].

**10b. *Chenopodium urbicum* subsp. *sinicum* H. W. Kung & G. L. Chu, Acta Phytotax. Sin. 16(1): 121. 1978.**

东亚市藜 dong ya shi li

Leaf blade rhombic-ovate, lower ones to 15 cm, margin with a pair of larger teeth near base. Glomerules many flowered, forming mainly terminal, spikelike panicles. Perianth segments 3–5, narrowly obovate to spatulate. Seed horizontal, oblique, or vertical, 0.5–0.7 mm in diam., obviously pitted, rim margin acute. Fl. and fr. Jul–Oct.

• Wastelands, saline-alkaline places, field margins. Hebei, Heilongjiang, N Jiangsu, Jilin, Liaoning, Nei Mongol, N Shaanxi, Shandong, Shanxi, N Xinjiang.

**11. *Chenopodium hybridum* Linnaeus, Sp. Pl. 1: 219. 1753.**

杂配藜 za pei li

Herbs annual, 0.4–2.2 m tall. Stem erect, sparsely branched above, stout, light yellow or purple ribbed, glabrous or sparsely farinose. Petiole 2–7 cm; leaf blade fresh green on both surfaces, broadly ovate to ovate-triangular, 6–15 × 5–13 cm, glabrous or slightly farinose, base rounded, truncate, or subcordate, margin palmately lobed to deeply erose-dentate, apex acute or acuminate; lobes in 2 or 3 pairs, unequal, apex usually acute to acuminate; upper leaves smaller, leaf blade mostly triangular-hastate, margin with a few lobelike teeth, sometimes

subentire. Flowers bisexual and female, usually several per glomerule, these arranged in spreading panicles on upper branches. Perianth segments 5, narrowly ovate, abaxially keeled, slightly farinose, margin membranous, apex obtuse. Stamens 5. Utricle lenticular; pericarp white dotted, membranous, adnate to seed. Seed horizontal, black, not lustrous, of same shape as utricle, usually 2–3 mm in diam., distinctly orbicular pitted; embryo annular. Fl. and fr. Jul–Sep.

Forest margins, scrub, valleys, slopes. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang [NE India, Japan, Korea, Mongolia, Russia (Siberia); C Asia, Europe; represented by a vicariant race in North America].

The *Chenopodium hybridum* aggregate is represented in China by at least two entities (subspecies or even species) which differ from the typical European and SW Asian plant (*C. hybridum* subsp. *hybridum*): (1) C Asian plants which were described as *C. badachschanicum* Tzvel-ev (Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 20: 434. 1960), and (2) E Asian plants which may be an as yet undescribed taxon. The plants from E China somewhat approach in their characters the North American species (or subspecies) *C. simplex* (Torrey) Rafinesque (*C. gigantospermum* (Aellen) Aellen). A new taxonomic revision of the *C. hybridum* aggregate throughout its range could clarify the situation.

**12. *Chenopodium giganteum* D. Don, Prodr. Fl. Nepal. 75. 1825.**

杖藜 zhang li

*Chenopodium amaranticolor* Coste & Reynier; *C. mairei* H. Léveillé.

Herbs annual, large, to 3 m tall. Stem erect, much branched above, stout, reddish green or reddish purple striate, ribbed, base to 5 cm in diam. Leaf blade abaxially light green, adaxially dark green, rhombic to ovate, to 20 × 16 cm, 1.5–2 × as long as petiole, abaxially farinose or glabrescent, adaxially not farinose, base broadly cuneate, margin irregularly undulate serrate, apex usually obtuse; upper leaf blades gradually becoming smaller, ovate to ovate-lanceolate, reddish or golden yellow vesicular hairy when young, margin serrate or entire. Inflorescence of large, terminal panicles, farinose, usually pendulous in fruit. Flowers bisexual, several per glomerule or solitary. Perianth segments 5, green or dark purple, ovate, margin membranous. Stamens 5. Utricle lenticular; pericarp membranous. Seed horizontal, black or red-black, ca. 1.5 mm in diam., reticulate lineate, rim margin obtuse. Fl. Aug, fr. Sep–Oct.

Long cultivated in China and becoming naturalized. Beijing, Gansu, Guangxi, Guizhou, Hebei, Henan, Hunan, Liaoning, Shaanxi, Sichuan, Taiwan, Yunnan [native origin unknown; commonly cultivated in many countries of the world].

This plant most probably represents a cultivar, which originated in India, of the *Chenopodium album* aggregate. Similar cultivated plants of E Asia were described as *C. centrurubrum* (Makino) Nakai. Other similar plants (probably of different origin) are known as *C. amaranticolor*, *C. purpurascens* Jacquin, etc. A new taxonomic revision of cultivated members of the *C. album* aggregate is badly needed.

The stout stems are used for making walking sticks.

**13. *Chenopodium ficifolium* Smith, Fl. Brit. 1: 276. 1800.**

小藜 xiao li

Herbs annual, 20–50 cm tall. Stem erect, green striate, ribbed. Leaf blade ovate-oblong, 2.5–5 × 1–3.5 cm, margin usually 3-lobed; central lobe margins almost parallel, subentire to sinuate-dentate, apex obtuse or subacute, mucronate; lateral lobes positioned in proximal 1/3 or near base of leaf blade, margin entire or shallowly dentate. Flowers bisexual, several per glomerule, these arranged in spreading, terminal panicles on upper branches. Perianth subglobose, 5-parted; segments valvate in bud, remaining closed at anthesis, broadly ovate, abaxially longitudinally keeled, densely farinose. Stamens 5, exerted at anthesis. Stigmas 2, filiform. Utricle included in perianth, falling together with it from plant; pericarp adnate to seed. Seed horizontal, black, sublustrous, ca. 1 mm in diam., distinctly hexagonally pitted, rim margin subobtuse; embryo annular. Fl. Apr–May.

Common weed of waste places, garbage dumps, roadsides, etc. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Asia, Europe; naturalized in North America and some other regions of the world].

*Chenopodium ficifolium* is represented in China by two subspecies: subsp. *ficifolium* and subsp. *blomianum* (Aellen) Aellen (Hegi, Ill. Fl. Mitt.-Eur., ed. 2, 3(2): 624. 1960; *C. blomianum* Aellen, Bot. Not. 1928: 203. 1928). The latter differs from the typical subspecies in having leaf blades with an often shorter middle lobe and less prominent lateral lobes, and seeds with shallower and less evident pits and a sinuous rim margin. It is distributed from Iraq to S and SE Asia. However, the typical subspecies also occurs within the range of subsp. *blomianum*. Both subspecies are variable, and several varieties have been described.

*Chenopodium ficifolium* occasionally hybridizes with other species of *C. sect. Chenopodium*.

The name *Chenopodium serotinum* Linnaeus has often been misapplied to this species but in fact refers to a species of *Atriplex*.

**14. *Chenopodium strictum* Roth, Nov. Pl. Sp. 180. 1821.**

圆头藜 yuan tou li

*Chenopodium betaceum* Andrzejewski; *C. striatum* (Krašan) Murr.

Herbs annual, 20–50 cm tall. Stem erect, basal branches ascending, upper branches usually erect; stem and branches green and red striate, often becoming deep beet red at maturity, ribbed. Leaf blade abaxially whitish gray to dark green, ovate-oblong to oblong, usually 1.5–3(–6) × 0.8–2.5 cm, 2–3 × as long as petiole, abaxially moderately to densely farinose, adaxially slightly or moderately farinose, base broadly cuneate, margin above base subentire to serrate or dentate, apex rounded, sometimes shortly mucronate; teeth gradually becoming smaller distally on margin. Glomerules arranged into narrow, interrupted, spikelike or moniliform panicles on upper part of branches. Flowers bisexual. Perianth segments 5, obovate, abaxially slightly keeled, margin membranous. Stigmas 2, filiform, recurved. Utricle depressed; pericarp adnate to seed. Seed black or black-red, sublustrous, depressed ovoid, ca. 1 mm in

diam., slightly lineate, rim margin acutely ribbed. Fl. and fr. Jul–Sep.

Valleys, river banks, roadsides. Gansu, Hebei, Shaanxi, Shanxi, S Xinjiang; also NE China [Japan, Korea, Russia (S Siberia)]; C and SW Asia, Europe; naturalized in North America and occasionally elsewhere].

The *Chenopodium strictum* group includes several closely related, predominantly (or exclusively?) tetraploid ( $2n = 36$ ) species or infraspecific taxa, such as *C. novopokrovskyanum* (Aellen) Uotila, *C. striatiforme* Murr, *C. strictum*, and some others. *Chenopodium novopokrovskyanum* (Aellen) Uotila (Ann. Bot. Fenn. 30: 192. 1993; *C. album* Linnaeus subsp. *novopokrovskyanum* Aellen, Trudy Rostovsk. Otd. Vsesoyuzn. Bot. Obshch. 2: 3. 1938) differs from *C. strictum* in having leaf blades narrow, densely farinose (grayish green to silvery), and with the margin entire or subentire, occasionally with 1, rarely 2, pairs of teeth. In its overall habit, *C. novopokrovskyanum* is superficially similar to North American species of *C. subsect. Leptophylla* Clemants & Mosyakin, but it is not directly related to them. *Chenopodium novopokrovskyanum* is known from the steppe and desert zones of SE Europe (SE European Russia and SE Ukraine), C and SW Asia, and probably also NW China, W Mongolia, and S Siberia. The distribution of this taxon in China needs clarification.

**15. *Chenopodium album* Linnaeus, Sp. Pl. 1: 219. 1753.**

藜 li

Herbs annual, 15–150 cm tall. Stem erect, much branched, green or purple-red striate, stout, ribbed; branches oblique or spreading. Leaf blade rhombic-ovate to broadly lanceolate, 3–6 × 2.5–5 cm, 1–2 × as long as petiole, abaxially ± farinose, adaxially usually glabrous, or sometimes reddish purple vesicular hairy on young leaves, base cuneate to broadly so, margin irregularly serrate, apex subobtuse or acute. Glomerules arranged into large or small panicles or spikelike panicles on upper part of branches. Flowers bisexual. Perianth segments 5, broadly ovate to elliptic, abaxially longitudinally keeled, farinose, margin membranous, apex acute or slightly emarginate. Stamens 5; anthers exerted. Stigmas 2. Pericarp adnate to seed. Seed horizontal, black, sublustrous, lenticular, 1–1.5 mm in diam., lineate, rim margin obtuse. Fl. and fr. May–Oct.

Fields, waste places, roadsides, a difficult weed to control. Throughout China [probably throughout temperate and tropical regions of the world].

*Chenopodium album* s.l. in its more or less traditional circumscription is a diverse aggregate of predominantly hexaploid ( $2n = 54$ ) taxa. It is represented in China by many insufficiently known and poorly delimited infraspecific entities. Some of them are, however, rather distinct from European plants. The taxonomic situation is further obscured by exceptional variability and widespread hybridization in the group. Consequently, no attempt has been made here to classify the Chinese infraspecific entities of *C. album* s.l. The precise global distribution is uncertain because many plants reported as *C. album* in the literature in fact belong to other, closely related species.

