

36. ALYSSUM Linnaeus, Sp. Pl. 2: 650. 1753.

庭芥属 ting qi shu

Gamosepalum Haussknecht; *Meniocus* Desvoux; *Moenchia* Roth (1788), not Ehrhart (1783); *Odontarrhena* C. A. Meyer; *Psilonema* C. A. Meyer; *Ptilotrichum* C. A. Meyer; *Takhtajaniella* V. E. Avetisian; *Triplopetalum* E. J. Nyárády.

Herbs annual, biennial, perennial, or rarely subshrubs. Trichomes stellate, stalked or sessile, with 2–6 minute basal branches from which originate up to 30, simple or branched rays, sometimes trichomes lepidote, rarely mixed with simple and forked. Stems erect or decumbent, simple or branched. Basal leaves petiolate or sessile, rosulate or not rosulate, simple, entire. Cauline leaves petiolate or sessile, cuneate or attenuate, not auriculate, entire. Racemes few to many flowered, dense or lax, ebracteate, corymbose or in panicles, elongated or not in fruit. Fruiting pedicels ascending, divaricate, or reflexed. Sepals ovate or oblong, base of lateral pair not saccate. Petals yellow, white, or rarely pink; blade suborbicular, obovate, or spatulate, apex obtuse or emarginate, glabrous or pubescent outside. Stamens 6, tetradynamous; filaments wingless or uni- or bilaterally winged, appendaged or not, toothed or toothless; anthers ovate or oblong, apiculate or not at apex. Nectar glands 4, lateral, 1 on each side of lateral stamen; median glands absent. Ovules 1 or 2 (or 4–8) per ovary; placentation apical or parietal. Fruit dehiscent silicles, oblong, ovate, obovate, elliptic, obcordate, or rarely globose, strongly latiseptate or rarely inflated, sessile; valves veinless, pubescent or glabrous, smooth; replum rounded; septum complete, membranous, translucent, veinless; style distinct; stigma capitate, entire. Seeds biseriate, winged or wingless, orbicular or ovate, flattened; seed coat smooth or minutely reticulate, mucilaginous or not when wetted; cotyledons accumbent or incumbent.

About 170 species; primarily in SW Asia and SE Europe; ten species in China.

In his protologue of *Ptilotrichum*, Meyer (in Ledebour, Fl. Altaic. 3: 64. 1831) distinguished the genus by having white flowers, edentate filaments, and 1-seeded locules. However, these characters are also found in *Alyssum*, in many species of which one of the two ovules fails to mature into a seed, while in others the filaments are edentate. As for the flower color, it is definitely unreliable in *Alyssum sensu lato*, just as is the case in numerous other genera of the family, namely *Cardamine*, *Draba*, *Lepidium*, and *Rorippa*. In fact, the filament base in most plants of *P. canescens*, the generic type of *Ptilotrichum*, produces a small, basal tooth. If one accepts *Ptilotrichum* as a distinct genus, then at least five of the other segregates of *Alyssum* (*Gamosepalum*, *Meniocus*, *Odontarrhena*, *Psilonema*, and *Takhtajaniella*) should also be recognized, an action that the present authors do not support, especially after examining the genus critically on a worldwide basis.

Although *Alyssum fedtschenkoanum* N. Busch was suspected in FRPS to occur in W China, the present authors have seen no Chinese material in the numerous herbaria they consulted both inside and outside of China. The species is narrowly endemic to Kazakstan. It is likely that the plant recorded in FRPS represents a minor variant of the widespread and highly variable *A. tortuosum*.

The ovule number and placentation are important in the identification of the species and can be easily observed in the fruit.

1a. Plants annual.

2a. Fruit flattened; ovules 4–8 per locule; placentation parietal 1. *A. linifolium*

2b. Fruit inflated (biconvex) at least in the middle; ovules 2 per locule; placentation subapical.

3a. All filaments slender, without teeth, wings, or appendages; pedicels and sepals with stellate trichomes

mixed with longer, simple and forked ones.

4a. Fruit with stellate trichomes only; fruiting pedicels divaricate or ascending, 2–5(–6) mm, slender, not appressed to rachis 2. *A. alyssoides*

4b. Fruit with stellate trichomes mixed with longer, simple and forked ones; fruiting pedicels erect or ascending, (1–)1.3–1.8(–2) mm, stout, subappressed to rachis 3. *A. dasycarpum*

3b. Filaments of lateral stamens with 2-toothed appendage, median filaments winged and often toothed;

pedicels and sepals with stellate and rarely a few forked trichomes.

5a. Fruit glabrous, 2.5–4(–4.5) mm in diam.; style 0.3–0.7 mm; seeds 1.2–1.5 mm; median filaments toothless 4. *A. desertorum*

5b. Fruit densely stellate, (3.5–)4–6.5(–7) mm in diam.; style 0.7–1.6 mm; seeds 1.6–2 mm; median filaments 1- or 2-toothed 5. *A. simplex*

1b. Plants perennial with a woody base.

6a. Petal blade white; petal claws and filaments pink, papillate at base.

7a. Plants often pulvinate, (1–)2–9(–12) cm tall; petals 2–3(–3.5) mm; leaf trichomes rhomboid in outline,

with (3 or)4 principal minute branches from stalk apex; seeds 1.4–1.8 × 0.8–1.1 mm 9. *A. canescens*

7b. Plants not pulvinate, (5–)8–25(–30) cm tall; petals (3–)3.5–5 mm; leaf trichomes narrowly lanceolate

in outline, with only 2 principal minute branches from stalk apex; seeds (1.8–)2–2.5 × 1–1.5 mm

- 10. *A. tenuifolium*
- 6b. Petals and filaments yellow; claws and filaments glabrous at base.
 - 8a. Petals (4.5–)5–7(–8) mm; fruit deeply emarginate at apex 8. *A. lenense*
 - 8b. Petals 1.5–3.5(–4) mm; fruit obtuse to subacute at apex.
 - 9a. Stems erect or ascending at base, stout; sterile shoots often several; petals 2.5–3.5(–4) mm; fruit 2.5–3.5 mm wide 6. *A. obovatum*
 - 9b. Stems tortuous at base, slender; sterile shoots often absent; petals 1.5–3 mm; fruit (1.5–)1.8–2.5 mm wide 7. *A. tortuosum*

1. *Alyssum linifolium* Stephan ex Willdenow, Sp. Pl. 3: 467. 1800.

条叶庭荠 *tiao ye ting qi*

Alyssum cupreum Freyn & Sintenis; *A. linifolium* var. *cupreum* (Freyn & Sintenis) T. R. Dudley; *A. linifolium* var. *tehranicum* Bornmüller; *A. serpyllifolium* Desfontaines; *Meniocus australasicus* Turczaninow; *M. linifolium* (Stephan ex Willdenow) de Candolle.

Herbs annual, (4–)10–30(–40) cm tall, canescent, with appressed, sessile, (7–)10–18-rayed stellate trichomes. Stems erect, ascending, or rarely prostrate, simple or branched near base, always branched above. Cauline leaves shortly petiolate or sessile; leaf blade linear-ob lanceolate or linear, (0.5–)0.7–2 (–3.5) cm × (0.5–)1–2.5(–3.5) mm, base attenuate, apex obtuse or acute. Fruiting pedicels divaricate or ascending, 2–5(–7) mm, slender, straight, covered with stellate trichomes. Sepals oblong, 1.2–2 × 0.4–0.5 mm, caducous, pubescent with stellate trichomes. Petals white or pale yellow, linear-ob lanceolate, 1.2–2.5(–3) × 0.6–1 mm, glabrous, caducous, apex emarginate. Median filaments 1–1.5 mm, 1-toothed; lateral filaments 0.8–1.5, with an appendage 0.3–0.5 mm; anthers ovate, 0.15–0.2 mm. Ovules 4–6(–8) per locule. Fruit obovate, obovate-oblong, or broadly elliptic, (3.5–)4–7 × (2–)2.5–4(–4.5) mm, apex obtuse; valves not veined, flattened throughout, glabrous; style (0.1–)0.3–0.5 mm, slender, glabrous. Seeds 3–6(–8) per locule, oblong or ovate, 1–1.5 × 0.6–0.9 mm, biseriate, compressed, narrowly margined all around, margin to 0.1 mm wide. Fl. and fr. Apr–Jun. $2n = 16$.

Roadsides, cultivated areas, plains, hillsides, steppe, rocky places; 100–2700 m. Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia, Europe; naturalized in Australia].

2. *Alyssum alyssoides* (Linnaeus) Linnaeus, Syst. Nat., ed. 10, 2: 1130. 1759.

欧洲庭荠 *ou zhou ting qi*

Clypeola alyssoides Linnaeus, Sp. Pl. 2: 652. 1753; *Alyssum calycinum* Linnaeus; *A. campestre* (Linnaeus) Linnaeus; *Pilonema alyssoides* (Linnaeus) Heideman; *P. calycinum* (Linnaeus) C. A. Meyer.

Herbs annual, 5–35(–50) cm tall, canescent with appressed, sessile, 6–10-rayed stellate trichomes, these mixed with simple and forked ones on pedicels and sepals. Stems erect, ascending, or decumbent, 1 to several from the base. Cauline leaves subsessile or lowermost shortly petiolate; leaf blade narrowly oblanceolate or linear, sometimes spatulate or obovate, 3–4(–4.5) cm × (0.5–)1–3.5(–5) mm, base attenuate or cuneate, apex obtuse or acute. Fruiting pedicels divaricate or ascending, 2–5(–6) mm, slender, straight, covered with stellate trichomes mixed with fewer, simple and forked ones. Sepals oblong, (1.5–)2–3 × 0.7–1.1 mm, persistent, pubescent as pedicels. Petals white or pale yellow, linear to linear-ob lanceolate, rarely obovate, 2–3(–4) × 0.3–0.7(–1) mm, glabrous or sparsely stellate outside, often persistent, apex emarginate. Filaments 1–1.5 mm, slender, neither appendaged nor toothed; anthers ovate, 0.15–0.2 mm. Ovules 2 per locule. Fruit orbicular, (2–)3–4(–5) mm in diam., apex emarginate or truncate; valves not veined, uniformly inflated at center, strongly flattened at margins, sparsely stellate; style 0.3–0.6(–1) mm, slender, usually glabrous. Seeds 1 or 2 per locule, oblong or ovate, 1.1–2 × 0.7–1.1 mm, compressed, narrowly margined all around, margin ca. 0.1 mm wide. Fl. and fr. May–Jul. $2n = 32$.

Roadsides, waste grounds, disturbed sites; near sea level to 2800 m. Naturalized in Liaoning [Afghanistan, Kazakstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia, Europe; naturalized in North and South America].

3. *Alyssum dasycarpum* Stephan ex Willdenow, Sp. Pl. 3: 469. 1800.

粗果庭荠 *cu guo ting qi*

Alyssum dasycarpum var. *minus* Bornmüller ex T. R. Dudley; *A. dasycarpum* var. *pterospermum* Bordzilowski; *Pilonema dasycarpum* (Stephan ex Willdenow) C. A. Meyer.

Herbs annual, (3–)5–25(–35) cm tall, canescent, with appressed, sessile, 8–14-rayed stellate trichomes, these mixed with longer, simple and forked ones on pedicels, sepals, and fruit. Stems erect, ascending, or decumbent, often several from the base. Cauline leaves subsessile or lowermost attenuate to petiolelike base to 5 mm; leaf blade spatulate, obovate, or oblong-ob lanceolate, (0.5–)0.8–2.5(–4) cm × (2–)4–10(–15) mm, gradually smaller upward, base attenuate, apex acute. Fruiting

pedicels erect or ascending, (1–)1.3–1.8(–2) mm, subappressed to rachis, stout, straight, covered with stellate trichomes mixed with fewer, simple and forked ones. Sepals lanceolate, 2–3 × 0.8–1.3 mm, persistent till fruit maturity, pubescent as pedicels. Petals pale yellow, spatulate, 2.5–3.5(–3.8) × 0.6–1 mm, glabrous, often persistent, base attenuate, apex deeply emarginate. Filaments 2–2.5 mm, slender, neither appendaged nor toothed; anthers ovate, 0.3–0.4 mm. Ovules 2 per locule. Fruit orbicular or orbicular-elliptic, 2.4–3.5(–4) mm in diam., apex rounded or truncate; valves not veined, uniformly inflated except for a narrow flattened margins, with stellate trichomes mixed with longer, simple and forked ones; style (1–)1.5–2 mm, much broader at base, pilose and stellate at least along proximal half. Seeds usually 2 per locule, ovate, 1.1–1.3 × 0.8–1 mm, slightly compressed, usually not margined. Fl. and fr. Mar–Jun. $2n = 16$.

Valleys, steppe, fields; 100–2600 m. Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

4. *Alyssum desertorum* Stapf, Denkschr. Kaiserl. Akad. Wiss., Math.-Naturwiss. Kl. 51: 302. 1886.

庭荠 ting qi

Alyssum minimum Willdenow, Sp. Pl. 3: 464. 1800, p.p., not Linnaeus (1753); *A. desertorum* var. *himalayense* T. R. Dudley; *A. desertorum* var. *prostratum* T. R. Dudley; *A. turkestanicum* Regel & Schmalhausen var. *desertorum* (Stapf) Botschantzev; *Polygonum minimum* Schur.

Herbs annual, (2–)5–18(–28) cm tall, canescent throughout (except fruit) with appressed, sessile, 8–20-rayed stellate trichomes. Stems erect, ascending, or decumbent, often several from the base. Cauline leaves subsessile or lowermost attenuate to petiolelike base to 5 mm; leaf blade linear to oblanceolate-linear, (0.3–)0.5–2.5(–3) cm × (0.5–)1–3(–4) mm, gradually smaller upward, base attenuate, apex acute. Fruiting pedicels ascending or subdivaricate, (1–)1.5–3.5(–4.5) mm, stout, straight, covered with stellate trichomes only. Sepals oblong, 1.4–1.8(–2) × 0.4–0.5 mm, deciduous, stellate. Petals pale yellow, oblanceolate, 2–2.5 × 0.5–0.6 mm, sparsely stellate outside, caducous, base attenuate, apex obtuse or retuse. Filaments 1–1.8(–2) mm; median pairs gradually expanded from apex to narrowly winged base, not toothed; lateral pair with a broadly winged appendage apically notched into 2 teeth; anthers ovate, 0.1–0.2 mm. Ovules 2 per locule. Fruit orbicular, 2.5–4(–4.5) mm in diam., apex shallowly emarginate; valves not veined, uniformly inflated at middle, broadly flattened at margin, glabrous and often glaucous; style 0.3–0.7 mm, slender, glabrous. Seeds often 2 per locule, ovate, 1.2–1.5 × 0.9–1.1 mm, slightly compressed, margined or not. Fl. and fr. Apr–Jun. $2n = 32$.

Deserts, rocky areas; near sea level to 2600 m. Xinjiang, Xizang [Afghanistan, India, Kashmir, Kazakstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; Europe; naturalized in North America].

Dudley (Notes Roy. Bot. Gard. Edinburgh 24: 157–165. 1962) divided *Alyssum desertorum* into three varieties distinguished largely on the basis of minor differences in fruit trichomes. In the present authors' opinion, these varieties do not seem to merit recognition. The occurrence in Xizang of this species, which was not recorded in Fl. Xizang. (vol. 2. 1985), is based on the holotype of var. *himalayense*, Hügel 1191 (W).

5. *Alyssum simplex* Rudolphi, J. Bot. (Schrader) 1799(2): 290. 1799.

新疆庭荠 xin jing ting qi

Alyssum micranthum C. A. Meyer; *A. minus* Rothmaler; *A. minus* var. *micranthum* (C. A. Meyer) T. R. Dudley; *A. parviflorum* Marschall von Bieberstein.

Herbs annual, (3–)7–25(–35) cm tall, canescent throughout with appressed, coarse, sessile, (3–)5–10-rayed stellate trichomes sometimes with unequal rays. Stems erect, ascending, or decumbent, often several from the base. Cauline leaves subsessile or lowermost attenuate to petiolelike base to 4 mm; leaf blade oblanceolate, obovate-spatulate, or elliptic-lanceolate, (0.5–)0.7–2.2(–3) cm × (1–)2–6(–8) mm, gradually smaller upward, base attenuate, apex acute. Fruiting pedicels divaricate, (2–)3–5(–6) mm, stout, straight, covered with stellate trichomes only. Sepals oblong, 1.7–2.3 × 0.8–1.1 mm, deciduous, with stellate trichomes. Petals pale yellow, oblanceolate, (1.8–)2–2.8(–3.2) × 0.6–0.8 mm, sparsely stellate outside or glabrous, caducous, base attenuate, apex often emarginate. Filaments 1.4–2 mm; median pairs broadly winged, apically 1- or 2-toothed; lateral pair with a broadly winged appendage apically 2-cleft; anthers ovate, 0.3–0.4 mm. Ovules 2 per locule. Fruit orbicular, (3.5–)4–6.5(–7) mm in diam., apex truncate or shallowly emarginate; valves not veined, uniformly inflated at middle, broadly flattened at margin, densely covered with coarse, stellate, equal- or unequal-rayed trichomes; style 0.7–1.6 mm, slender, glabrous or basally stellate. Seeds often 2 per locule, ovate, 1.6–2 × 1.2–1.5 mm, slightly compressed, margined or not. Fl. and fr. Apr–Jun. $2n = 16$.

Mountain slopes, open places, fields, steppe, meadows; 100–2600 m. Xinjiang [Russia, Turkmenistan; N Africa, SW Asia, Europe; naturalized in North America].

6. *Alyssum obovatum* (C. A. Meyer) Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 10: 57. 1837.

倒卵叶庭荠 dao luan ye ting qi

Odontarrhena obovata C. A. Meyer in Ledebour, Fl. Altaic. 3: 61. 1831; *Alyssum americanum* Greene; *A. biovulatum* N. Busch; *A. fallax* E. J. Nyárády.

Herbs perennial, caespitose, 7–15(–20) cm tall, often woody at base, canescent throughout, with sessile, 10–25-rayed stellate trichomes. Stems usually erect or ascending, often several from caudex, sterile shoots often several. Cauline leaves subsessile; leaf blade

broadly oblanceolate, obovate-spatulate, or obovate, 0.6–1.4(–1.7) cm × (1–)2–6 mm, gradually smaller upward, base attenuate, apex rounded, obtuse, or subacute. Racemes corymbose, simple or in a panicle terminating each stem. Fruiting pedicels divaricate, (2–)3–7(–9) mm, slender, straight, uniformly stellate. Sepals oblong, 1.5–2 × 0.7–1 mm, deciduous, stellate. Petals yellow, broadly spatulate, 2.5–3.5(–4) × 1–1.5 mm, glabrous outside, caducous, base attenuate, apex often obtuse or rounded. Filaments 1.5–2 mm; median pairs unilaterally broadly winged, apically 1-toothed; lateral pair with a lanceolate or narrowly oblong basal appendage apically obtuse or subacute; anthers oblong, 0.3–0.4 mm. Ovules 1(or 2) per locule. Fruit broadly elliptic or obovate, 3–4.5(–5) × 2.5–3.5 mm, apex obtuse to rounded; valves not veined, inflated at middle or on 1 side, flattened at margin, densely covered with stellate trichomes; style 1.5–2 mm, slender, glabrous. Seeds 1(or 2) per locule, ovate, 1.1–1.4 × 0.8–1.1 mm, compressed, not margined. Fl. May–Jul, fr. Jun–Aug. $2n = 16, 30, 32$.

Mountain slopes, cliffs, gravel, rocky places; 500–1500 m. Heilongjiang, Nei Mongol [Kazakhstan, Mongolia, Russia; North America (Alaska, Canada)].

The records in FRPS and Fl. Intramongol. (ed. 2, 2: 646. 1990) of *Alyssum sibiricum* Willdenow, as occurring in Nei Mongol and Heilongjiang, are based on misidentified plants of *A. obovatum*. True *Alyssum sibiricum* is restricted to the Balkan Peninsula, Turkey, Crimea, and the Caucasus. Although the present authors have seen no material of *A. obovatum* from Xinjiang, the species is likely to be gathered from Altay Shan, where it has been extensively collected from the Russian and Mongolian parts of this range. The records herein of *A. obovatum* from Heilongjiang and Nei Mongol are based on *Litvinov 147* (LE) and *Wang Zhan 507* (PE), respectively.

7. *Alyssum tortuosum* Willdenow, Sp. Pl. 3: 466. 1800.

扭庭荠 niu ting qi

Alyssum alpestre Linnaeus var. *tortuosum* (Willdenow) Fenzl.

Herbs perennial, caespitose, 6–30(–50) cm tall, often woody at base, canescent throughout, with sessile, 10–18-rayed stellate trichomes. Stems tortuous at base, slender, several from caudex, sterile shoots often absent at flowering. Cauline leaves subsessile; leaf blade narrowly obovate or oblanceolate, 0.5–2(–2.5) cm × 1–3(–5) mm, gradually smaller upward, base attenuate, apex acute to subacuminate. Racemes corymbose, in a panicle terminating each stem. Fruiting pedicels divaricate or rarely ascending, (2–)3–6(–8) mm, slender, straight or slightly curved upward, uniformly stellate. Sepals oblong, 1.2–1.8 × 0.5–0.6 mm, deciduous, stellate. Petals yellow, spatulate, 1.5–3 × 0.7–1 mm, glabrous or stellate outside, caducous, base attenuate, apex often obtuse or rounded. Filaments 1–1.5 mm; median pairs unilaterally broadly winged, apically 1- or 2-toothed; lateral pair with a lanceolate basal

appendage apically acute; anthers ovate, 0.2–0.3 mm. Ovules 1(or 2) per locule. Fruit elliptic to elliptic-obovate, 2.5–4(–4.5) × (1.5–)1.8–2.5 mm, apex obtuse to subacute; valves not veined, often asymmetrically inflated on 1 side, flattened on other, densely covered with stellate trichomes; style 0.5–1.5 mm, slender, glabrous or sparsely with stellate trichomes basally. Seeds 1(or 2) per locule, ovate, 1.1–1.4 × 0.8–1.1 mm, compressed, not margined. $2n = 16, 32$.

Xinjiang [Kazakhstan, Russia, Turkmenistan; SW Asia, Europe].

The above description is based on non-Chinese material. The Xinjiang plants examined by the present authors are tentatively assigned to this species.

8. *Alyssum lenense* Adams, Mém. Soc. Imp. Naturalistes Moscou 5: 110. 1817.

北方庭荠 bei fang ting qi

Alyssum altaicum C. A. Meyer; *A. altaicum* var. *dasycarpum* C. A. Meyer; *A. altaicum* var. *leiocarpum* C. A. Meyer; *A. calycocarpum* Ruprecht var. *edentatum* H. L. Yang; *A. fischerianum* de Candolle; *A. lenense* var. *dasycarpum* (C. A. Meyer) N. Busch; *A. lenense* var. *leiocarpum* (C. A. Meyer) N. Busch.

Herbs perennial, caespitose, (3–)7–25(–30) cm tall, often woody at base, canescent throughout with sessile, 7–16-rayed stellate trichomes. Stems usually erect or ascending, often several from caudex, sterile shoots often several. Cauline leaves subsessile; leaf blade linear-lanceolate to linear-oblong, 0.4–2(–3) cm × (0.5–)1–3 mm, gradually smaller upward, base attenuate, apex acute. Racemes corymbose, simple on each stem. Fruiting pedicels divaricate, (3–)4–7(–9) mm, stout, straight, uniformly stellate or sometimes also with simple and forked trichomes. Sepals oblong, 2.5–3 × 1–1.5 mm, deciduous or rarely persistent, stellate. Petals yellow, broadly spatulate, (4.5–)5–7(–8) × (1–)2–3 mm, glabrous outside, caducous, base attenuate, apex rounded or emarginate. Filaments 2.5–4 mm; median pairs slender or slightly flattened above base, neither winged nor toothed; lateral pair with a minute, unilateral tooth just above base; anthers narrowly oblong, 0.7–1 mm. Ovules 2 per locule. Fruit broadly oblong or oblong-obovate, (3–)4–7 × 3–5 mm, apex emarginate and to 0.5 mm deep; valves not veined, 1 inflated, another concave, margin often not flat, glabrous or sparsely stellate; style 1.5–2.8(–3.5) mm, slender, glabrous. Seeds 2 per locule, ovate or oblong, 1.3–2 × 0.9–1.2 mm, compressed, not margined. Fl. May–Jun, fr. Jul–Aug. $2n = 16$.

Grassy slopes, forests, sandy places. Gansu, Hebei, Heilongjiang, Nei Mongol, Xinjiang [Kazakhstan, Mongolia, Russia].

An examination of the holotypes of *Alyssum lenense* and *A. calycocarpum* var. *edentatum* reveals that they are one taxon. The former is highly variable, and some of its many forms were previously recognized as varieties. *Alyssum calycocarpum* Ruprecht

is restricted to the Caucasus and adjacent SW Asia. In fact, the type of var. *edentatum* is very similar to plants of *A. lenense* that have persistent sepals and that were described as *A. altaicum*.

9. *Alyssum canescens* de Candolle, Syst. Nat. 2: 322. 1821.

灰毛庭荠 hui mao ting qi

Alyssum canescens var. *abbreviatum* de Candolle;
Ptilotrichum canescens (de Candolle) C. A. Meyer.

Herbs perennial, often pulvinate, (1–)2–9(–12) cm tall, silvery canescent throughout, with short-stalked, stellate trichomes rhomboid in outline and with (3 or)4, branched, principal rays from stalk apex. Stems usually erect or ascending, often several from woody base, sterile shoots often several. Cauline leaves fleshy, sessile; leaf blade oblong or linear, 4–12(–15) × 0.5–2(–3) mm, often grooved adaxially, base attenuate, apex obtuse or subacute. Fruiting pedicels ascending, (3–)4–7 mm, slender, often curved, base subappressed. Sepals oblong, 1.5–2.2 × 1–1.5 mm, deciduous, stellate. Petals white, obovate, 2–3(–3.5) × 1.5–2.5(–3) mm, glabrous outside, caducous, apex rounded; claw often pink, minutely papillate at base. Filaments 1.5–2 mm, dilated and papillate at base, neither winged nor appendaged, lateral pair often minutely dentate above base; anthers ovate, 0.4–0.5 mm. Ovules 1 per locule. Fruit broadly ovate or elliptic-ovate, (2–)4–5 × (1.5–)2–3 mm, apex acute; valves not veined, slightly flattened, densely stellate; style 0.5–2 mm, slender, glabrous. Seeds 1 per locule, ovate, 1.4–1.8 × 0.8–1.1 mm, compressed, not margined. Fl. Jun–Sep, fr. Jul–Oct.

Dry rocky slopes, grassy areas, grasslands, river banks, rock crevices, gravel, alpine steppe; 1000–5000 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Xinjiang, Xizang [Kashmir, Kazakhstan, Mongolia, Russia (Siberia)].

10. *Alyssum tenuifolium* Stephan ex Willdenow, Sp. Pl. 3: 460. 1800.

细叶庭荠 xi ye ting qi

Alyssum canescens de Candolle var. *elongatum* de Candolle; *Ptilotrichum canescens* (de Candolle) C. A. Meyer subsp. *tenuifolium* (Stephan ex Willdenow) Hanelt & Davamzac; *P. elongatum* (de Candolle) C. A. Meyer; *P. tenuifolium* (Stephan ex Willdenow) C. A. Meyer.

Herbs perennial, (5–)8–25(–30) cm tall, silvery canescent throughout, with short-stalked, stellate trichomes lanceolate in outline and with 2, branched, principal rays from stalk apex. Stems usually erect or ascending, often several from woody base, sterile shoots often several. Cauline leaves fleshy, sessile; leaf blade linear, very rarely narrowly oblanceolate, (0.5–)1–2 (–2.5) cm × 0.5–2(–4) mm, often grooved adaxially, base attenuate, apex obtuse or subacute. Fruiting pedicels ascending or suberect, 3–12 mm, slender, straight. Sepals oblong, 1.5–2.2 × 1–1.5 mm, deciduous, stellate. Petals white, obovate or sub-orbicular, (3–)3.5–5 × (2–)2.5–3.5 mm, glabrous

outside, caducous, apex rounded; claw often pink, minutely papillate at base. Filaments 1–2.5 mm, dilated and papillate at base, neither winged nor appendaged; anthers ovate or oblong, 0.4–0.6 mm. Ovules 1(or 2) per locule. Fruit broadly ovate or lanceolate-ovate, 4–6 × 2–4 mm, apex acute or acuminate; valves not veined, slightly flattened, densely stellate; style 1–2.5 mm, slender, glabrous. Seeds 1 per locule, ovate, (1.8–)2–2.5 × 1–1.5 mm, compressed, not margined. Fl. Jun–Aug, fr. Jul–Oct. $2n = 88, 92$.

Steppe, rocky places, sandy ravines, dry sandy slopes; 900–2400 m. Nei Mongol [Kazakhstan, Mongolia, Russia (Siberia)].

Except for differences in the trichomes, *Alyssum canescens* and *A. tenuifolium* overlap in plant height, petal length, and seed size, and they are sometimes separated with difficulty. A critical field study in parts of their ranges where they overlap, especially in Nei Mongol, Mongolia, and Siberia, is needed in order to reach a better understanding of their limits. Hybridization between the two species (Botschantzev, Bot. Zhurn. (Moscow & Leningrad) 44: 1486. 1959) was suggested, but no experimental work supports that hypothesis. *Alyssum tenuifolium* was not listed in FRPS but was recorded for China (as *Ptilotrichum tenuifolium*) in Fl. Intramongol. (ed. 2, 2: 648. 1990). Several collections from Nei Mongol were examined by the present authors, including *Roerich Expedition 375* (US) and *Petrov s.n.* (LE). Another species, *P. dahuricum* Peschkova (Novosti Sist. Vyssh. Rast. 15: 230. 1979), if indeed distinct from *A. tenuifolium*, was said to occur in China (Fl. Siberiae 7: 107. 1994), but the present authors have seen no Chinese material.

