

68. CHORISPORIA R. Brown ex de Candolle, *Mém. Mus. Hist. Nat.* 7: 237. 1821, nom. cons.
离子芥属 li zi jie shu

Chorispermum W. T. Aiton, nom. rej.

Herbs annual or perennial. Trichomes stalked, glandular, mixed with eglandular simple ones. Stems leafy or not. Basal leaves petiolate, rosulate or not, sinuate-dentate, pinnatifid, or pinnatisect, rarely entire. Cauline leaves absent or shortly petiolate, not auriculate, similar to basal ones. Racemes ebracteate, elongated in fruit, rarely flowers solitary on long pedicels from axils of rosette leaves. Sepals ovate, oblong, or linear, erect, base of lateral pair strongly saccate. Petals yellow or purple or lavender, much longer than sepals; blade broadly obovate, obcordate or rarely oblanceolate, apex emarginate or rarely obtuse; claws strongly differentiated from blade. Stamens 6, strongly tetradynamous; filaments not dilated at base; anthers narrowly oblong or linear, obtuse at apex. Nectar glands 2 or 4, lateral, intrastaminal or 1 on each side of lateral stamen; median glands absent. Ovules (5–)10–25(–30) per ovary. Fruit breaking into 1-seeded units, lomentaceous, linear, terete, sessile, slightly to strongly torulose or submoniliform; units indehiscent, with a thick corky or woody wall; replum flattened, persisting after segments fall off; septum becoming corky and splitting at middle; style 1.5–21 mm, beaklike; stigma conical, 2-lobed, lobes decurrent, strongly connivent. Seeds uniseriate, wingless, oblong; not mucilaginous when wetted; cotyledons accumbent.

Eleven species: primarily C and SW Asia; eight species (one endemic) in China.

1a. Plants annual; flowering stems leafy.

2a. Flowers purple; fruit slightly torulose 3. *C. tenella*

2b. Flowers yellow; fruit strongly torulose.

3a. Petals narrowly oblanceolate, 3–4 × 0.7–1 mm, rounded at apex; anthers 0.5–0.9 mm; style 2–4 mm

in fruit; fruiting pedicels suberect or ascending, subappressed 2. *C. tashkorganica*

3b. Petals broadly obovate, 6–20 × 3–7 mm, apex emarginate; anthers 1.5–2 mm; style 5–25 mm in fruit;

fruiting pedicels divaricate or recurved 1. *C. sibirica*

1b. Plants perennial with a caudex; flowering stems leafless or rarely 1-leaved, or flowers solitary.

4a. All flowers borne on solitary pedicels arising from basal rosette 4. *C. bungeana*

4b. Flowers always in racemes.

5a. Flowers purple.

6a. Sepals 3–4 mm; petals 6–10 mm; pedicel 0.3–1(–1.5) cm; fruiting style 1.5–3 mm 6. *C. sabulosa*

6b. Sepals 6–7 mm; petals 15–18 mm; pedicel (1.7–)2–3.5(–5.5) cm; fruiting style 5–7 mm .. 5. *C. greigii*

5b. Flowers yellow.

7a. Leaves pinnatisect; petals 12–15 × 5–7 mm; sepals oblong, 5.5–7 mm 7. *C. songarica*

7b. Leaves subentire, sinuate-dentate, or pinnatifid; petals 5–8(–10) × 2–4 mm; sepals ovate, 2–3(–3.5) mm 8. *C. macropoda*

1. *Chorispora sibirica* (Linnaeus) de Candolle, *Syst. Nat.* 2: 437. 1821.

西伯利亚离子芥 xi bo li ya li zi jie

Raphanus sibiricus Linnaeus, *Sp. Pl.* 2: 669. 1753;

Chorispora gracilis A. Ernst.

Herbs annual, (3–)7–22(–35) cm tall, with multicellular glandular trichomes, these sometimes mixed with simple ones to 2 mm. Stems ascending, branched basally and above. Basal leaves not rosulate; petiole (0.5–)1–2(–3) cm, often ciliate; leaf blade oblanceolate or oblong, (1.5–)2–4(–6) cm × 4–10(–15) mm, glandular, base cuneate or attenuate, margin sinuate-dentate or pinnatisect, with oblong or lanceolate lobes, apex acute. Cauline leaves similar to basal ones, progressively reduced in size upward, uppermost often subsessile. Flowers in racemes. Fruiting pedicels slender, (6–)7–10(–14) mm, divaricate, slightly recurved, glandular. Sepals narrowly oblong, 3–4(–5) × 1–2 mm. Petals bright yellow, broadly obovate, 7–9(–

12) × 3–4(–5) mm, emarginate at apex; claw 4–5 mm. Filaments 3–5 mm; anthers narrowly oblong, ca. 1.5 mm. Fruit linear-cylindric, 1.4–2(–2.5) cm × 1.5–2 mm, slightly curved upward, strongly torulose and with 6–12 constrictions on each side, glandular or rarely glabrescent; style (3–)5–9 mm. Seeds brown, oblong, 1–1.2 × 0.6–0.9 mm. Fl. Apr–Aug, fr. Jun–Sep.

Roadsides, fields, river beaches, grassy slopes; 700–3800 m. Xinjiang, Xizang [India, Kashmir, Kazakstan, Kyrgyzstan, Mongolia, Pakistan, Russia].

2. *Chorispora tashkorganica* Al-Shehbaz et al., *Novon* 10: 106. 2000.

塔什离子芥 ta shi li zi jie

Herbs annual, 12–20 cm tall, densely glandular throughout, apices of sepals and lobes of young leaves sparsely pubescent with simple trichomes to 1 mm, glabrous elsewhere. Stems several from base, decumbent, unbranched. Basal leaves rosulate; petiole 0.5–2.5 cm, not ciliate, expanded at base; leaf blade

linear to linear-lanceolate in outline, 1–5 cm × 1–10 mm, densely glandular, base attenuate, margin pinnatisect or sinuate-dentate, apex acute; lateral lobes deltate, acute, smaller than terminal lobe. Cauline leaves few, similar to basal ones but with fewer lobes. Racemes elongated considerably in fruit. Fruiting pedicels 1.5–3 mm, glandular, ascending to suberect, subappressed. Sepals yellowish, ovate, 2–3 × ca. 1 mm, glandular, margin membranous. Petals yellow, oblanceolate, 3–4 × 0.7–1 mm, rounded at apex; claw 2–2.5 mm. Filaments 2–3 mm; anthers oblong, 0.5–0.9 mm. Fruit linear-cylindric, 1.2–1.5 cm × 1.5–2 mm, corky, strongly torulose, with 5–8 constrictions on each side, glandular; style 2–4 mm. Seeds brown, oblong, ca. 1.4 × 1 mm. Fl. and fr. Jun–Jul.

• Rocky slopes; 4000–4200 m. SW Xinjiang (Taxkorgan Tajik Zizhixian).

3. *Chorispora tenella* (Pallas) de Candolle, Syst. Nat. 2: 435. 1821.

离子芥 li zi jie

Raphanus tenellus Pallas, Reise Russ. Reich. 3: 741. 1776; *R. monnetii* H. Léveillé.

Herbs annual, (5–)10–40(–56) cm tall, with multicellular glandular trichomes, these sometimes mixed with simple ones. Stems erect, branched above. Basal leaves not rosulate, often withered by flowering; petiole (0.5–)1–2(–4) cm; leaf blade oblanceolate or oblong, (1.5–)2.5–8(–13) × (0.4–)0.8–2(–3) cm, glandular, base cuneate or attenuate, margin sinuate-dentate to dentate, apex acute. Cauline leaves similar to basal ones, progressively reduced in size upward, uppermost often entire and sessile. Flowers in racemes. Fruiting pedicels stout, (2–)3–5 mm, divaricate, glandular. Sepals purplish, linear, (3–)4–5(–6) × 0.5–0.7 mm. Petals purple, oblanceolate, 8–10(–12) × 1–2 mm, obtuse at apex; claw 6–7 mm. Filaments 4–6(–7) mm; anthers narrowly oblong, ca. 1.5 mm. Fruit linear-cylindric, (1.4–) 1.8–2.5(–3) cm × 1.5–2 mm, slightly curved upward, corky, subtorulose, with 8–12 constrictions on each side, glandular or rarely glabrescent; style 1–1.7(–2.1) cm. Seeds brown, oblong, 1–1.4 × 0.8–1 mm. Fl. Apr–Jun, fr. May–Aug, 2n = 14.

Pastures, roadsides, fields, waste areas; 100–2200 m. Anhui, Gansu, Hebei, Henan, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Xinjiang [Afghanistan, India, Kashmir, Kazakstan, Korea, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia, Europe].

4. *Chorispora bungeana* Fischer & C. A. Meyer, Enum. Pl. Nov. 1: 96. 1941.

高山离子芥 gao shan li zi jie

Chorispora exscapa Bunge ex Ledebour; *C. tianschanica* Z. X. An.

Herbs perennial, scapose, with well-developed branched caudex; multicellular glandular trichomes sometimes mixed with simple ones to 2 mm. Basal leaves rosulate, persistent; petiole (1–)1.5–3(–4) cm, ciliate, expanded at base; leaf blade oblanceolate or oblong, (0.8–)1.2–4(–5) cm × 3–10(–15) mm, sparsely to densely glandular, pilose or glabrous, base cuneate or attenuate, margin pinnatipartite or pinnatisect, with up to 12, oblong or ovate lobes, or sinuate-dentate, dentate, repand, or entire, apex obtuse. Cauline leaves absent. Flowers solitary, arising from rosette. Fruiting pedicels (1–)1.5–3(–4) cm, densely glandular or subglabrous, sometimes also pilose. Sepals purplish, linear-oblong, (6–)7–9(–10) × 1–1.5 mm. Petals purple, broadly obovate or obcordate, (1.5–)1.7–2(–2.3) cm × 6–8 mm, emarginate or subrounded at apex; claw 0.9–1.2 cm. Filaments 6–10 mm; anthers narrowly oblong, 1.5–2.5 mm. Fruit linear-cylindric, 2–3 cm × 1.5–2 mm, corky, strongly torulose, with 8–12 constrictions on each side, glabrescent; style 4–7 mm. Seeds brown, oblong, 1.2–1.5 × 0.7–1 mm. Fl. Jun–Aug, fr. Jul–Sep.

Grasslands, open slopes; (2200–)3000–4200 m. Xinjiang [Afghanistan, India, Kashmir, Kazakstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Uzbekistan].

Chorispora tianschanica was said to differ from *C. bungeana* in being completely glandular and with serrate leaf margins and rounded petal apices. However, these alleged differences do not hold, and *C. bungeana* is highly variable throughout most of its range, especially in leaf morphology and the density of glandular papillae.

5. *Chorispora greigii* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 296. 1878.

具葶离子芥 ju ting li zi jie

Herbs perennial, 7–25 cm tall, with slender, often unbranched caudex, eglandular, glabrous throughout or rarely sparsely shortly pilose on sepals. Basal leaves rosulate; petiole 0.5–3 cm, glabrous, not expanded at base; leaf blade broadly oblanceolate, linear-lanceolate, or oblong, 2–7 cm × 3–15 mm, glabrous, base cuneate or attenuate, margin pinnatipartite, with up to 8 oblong or ovate lobes, or sinuate-dentate, apex obtuse. Cauline leaves few, similar to basal ones but much smaller. Flowers in racemes. Fruiting pedicels (1.7–)2–3.5(–5.5) cm, glabrous. Sepals purplish, oblong, 5–6(–7) × ca. 2 mm. Petals purple, broadly obovate or obcordate, 1.2–1.8 cm × 5–6 mm, emarginate at apex; claw 6–8 mm. Filaments 5–7.5 mm; anthers narrowly oblong, 2.5–3 mm. Fruit linear-cylindric, 2.5–4 cm × 2–3 mm, corky, strongly torulose, with 7–12 constrictions on each side, glabrous; style 5–9 mm. Seeds brown, oblong, 1.3–1.6 × 1–1.2 mm. Fl. and fr. Jun–Jul.

Mountains, grassy areas; 1800–2200 m. Xinjiang [Kyrgyzstan].

6. *Chorispora sabulosa* Cambessèdes in Jacquemont, Voy. Inde 4(Bot.): 15. 1844.

砂生离子芥 sha sheng li zi jie

Chorispora elegans Cambessèdes; *C. elegans* var. *integrifolia* O. E. Schulz; *C. elegans* var. *sabulosa* (Cambessèdes) O. E. Schulz; *C. elegans* var. *stenophylla*

O. E. Schulz; *C. sabulosa* var. *eglandulosa*
Narayanswamy ex Naithani & Uniyal.

Herbs perennial, 3–15 cm tall, with slender, branched caudex, glandular, glabrous or sparsely shortly pilose. Basal leaves rosulate; petiole 1–4 cm, usually ciliate, expanded at base; leaf blade oblanceolate or oblong, (1–)2–5(–8) cm × 3–7(–10) mm, glabrous or glandular, base cuneate, margin pinnatifid, sinuate-dentate or entire, apex acute or obtuse. Cauline leaves absent. Flowers in racemes. Fruiting pedicels 3–10(–15) mm, glabrous. Sepals purplish, ovate, 3–4 × 1.5–2 mm. Petals purple, broadly obovate, 6–10 × 3–5 mm, obtuse at apex; claw 3.5–5 mm. Filaments 3–5 mm; anthers oblong, 1–1.5 mm. Fruit linear-cylindric, 1–1.5(–1.7) cm × ca. 2 mm, corky, strongly torulose, with 2–6 constrictions on each side, glabrous or glandular; style 1.5–3 mm. Seeds brown, oblong, ca. 1.3 × 1 mm. Fl. and fr. Jun–Jul.

Mountain slopes; 2900–4800 m. Xizang [India, Kashmir, Kazakstan, Pakistan, Tajikistan, Uzbekistan].

Chorispora sabulosa and *C. elegans* were simultaneously published by Cambessèdes. Hooker and Thomson (J. Proc. Linn. Soc., Bot. 5: 181. 1861), who were the first to record the species from Xizang, listed the latter name as a synonym of *C. sabulosa*, which name therefore has priority under Art. 11.5 of the St. Louis Code. The species was not listed in FRPS or in Fl Xizang. (vol. 2. 1985), but the record from Xizang is here confirmed by the study of material cited by Hooker and Thomson (loc. cit.) and also by Jäschke s.n. (WU).

7. *Chorispora songarica* Schrenk in Fischer & C. A. Meyer, Enum. Pl. Nov. 2: 57. 1842.

准噶尔离子芥 zhun ga er li zi jie

Chorispora sibirica (Linnaeus) de Candolle var. *songarica* (Schrenk) O. Fedtschenko; *C. pamirica* Pachomova.

Herbs perennial, (0.4–)0.7–1.8(–4) cm tall, with stout, branched or simple caudex, sparsely to moderately glandular, sparsely covered with simple trichomes to 1 mm. Basal leaves rosulate; petiole 1–2.5(–6.5) cm, glabrous or sparsely ciliate, expanded at base; leaf blade oblong or oblanceolate, 1–2.5 cm × 2–8 mm, glandular or glabrous, base cuneate or attenuate, margin pinnatisect, with oblong or ovate lobes, apex acute. Cauline leaves few. Flowers in racemes. Fruiting pedicels (0.6–)1–1.8 (–2.5) cm, glabrous or glandular. Sepals yellowish, oblong, 5.5–7 × 1.5–2 mm. Petals yellow, broadly obovate, 1.2–1.5 cm × 5–7 mm, emarginate at apex; claw 6.5–9 mm. Filaments 6–7.5 mm; anthers oblong, ca. 2 mm. Fruit linear-cylindric, 1.5–2 cm × ca. 2 mm, corky, strongly torulose, with 5–8 constrictions on each side, glandular; style 3–5 mm. Seeds brown, oblong, ca. 1.2 × 0.7 mm. Fl. and fr. Jun–Jul.

Mountain slopes; 4300–4700 m. Xinjiang [Kazakstan, Tajikistan, Uzbekistan].

Chorispora songarica was first recorded from China in Fl. Xinjiang. (2(2): 168. 1995). The occurrence in China is here confirmed based

on Xinjiang Expedition 2268 (WUK) and Xinjiang Expedition 9740 (KUN), as well as on Robrowski s.n., 25 Mar 1889 (LE).

8. *Chorispora macropoda* Trautvetter, Bull. Soc. Imp. Naturalistes Moscou 33(1): 109. 1860.

小花离子芥 xiao hua li zi jie

Chorispora pectinata Hadac.

Herbs perennial, 4–15(–28) cm tall, with stout, branched or simple caudex, glandular throughout, sparsely covered with simple trichomes to 1 mm. Basal leaves rosulate; petiole 0.5–2.5(–4) cm, ciliate, expanded at base; leaf blade broadly oblanceolate or linear-lanceolate, 0.5–3(–4) cm × 2–7(–15) mm, glandular, base cuneate or attenuate, margin subentire, dentate, sinuate-dentate, or pinnatifid and with up to 8, oblong or ovate lobes, apex acute or obtuse. Cauline leaves absent. Flowers in racemes. Fruiting pedicels (6–)7–10(–15) mm, glandular. Sepals yellowish, ovate, 2–3(–3.5) × 1.5–2 mm. Petals yellow, 5–8(–10) × 2–4 mm; blade broadly obovate, emarginate at apex; claw 3–5 mm. Filaments 2–3 mm; anthers oblong, ca. 1.5 mm. Fruit linear-cylindric, 1–1.5(–2) cm × 2–2.3 mm, corky, strongly torulose, with 5–8 constrictions on each side, glandular; style 2–4 mm. Seeds brown, oblong, 1.1–1.3 × 0.6–0.8 mm. Fl. and fr. Jun–Jul.

Gravelly areas, slopes; (2200–)3000–4000(–4500) m. Xinjiang [Afghanistan, India, Kashmir, Kazakstan, Kyrgyzstan, Pakistan, Tajikistan].

Flora of China 8: 147–149. 2001.