

**16. MEGACARPAEA** de Candolle, *Mém. Mus. Hist. Nat.* 7: 230. 1821.

高河菜属 *gao he cai shu*

Herbs perennial with a caudex terminated by petiolar remains of previous years. Trichomes simple. Stems erect, simple basally, branched apically. Basal leaves petiolate, rosulate, simple, pinnately lobed or 1–3-pinnatisect, rarely palmately lobed. Cauline leaves petiolate or sessile, often auriculate or amplexicaul at base, sinuate, pinnately lobed, or pinnatisect. Racemes ebracteate, in panicles, elongated in fruit. Fruiting pedicels slender or stout, ascending, divaricate, or reflexed. Sepals oblong, deciduous, base of lateral pair not saccate, margin membranous. Petals yellow, creamy white, pink, or deep purple, rarely absent; blade obovate, oblong, oblanceolate, or oblong-linear, entire or rarely 3(–5)-toothed; claw absent or much shorter than sepals. Stamens 6 or (8–)12–16(–24), slightly tetradynamous or equal in length; filaments dilated at base; anthers oblong or linear, obtuse at apex. Nectar glands confluent around bases of all stamens; median glands present. Ovules 2 per ovary. Fruit indehiscent, schizocarpic, didymous, angustiseptate silicles, sessile or shortly stipitate; valves (mericarps) oblong, obovate, or orbicular, 1-seeded, leathery, smooth, broadly winged, keeled, glabrous; replum rounded; septum complete, thickened, opaque, veinless; style obsolete, rarely to 0.5 mm; stigma capitate, entire. Seeds wingless, broadly ovate or subreniform, strongly flattened; seed coat smooth, not mucilaginous when wetted; cotyledons accumbent.

Nine species: C Asia, Himalayas; three species in China.

1a. Fruiting pedicels stout, straight, divaricate or ascending; root napiform, fleshy; deserts ..... 2. *M. megalocarpa*

1b. Fruiting pedicels slender, recurved or reflexed; root cylindrical, not fleshy; mountains

2a. Petals pink or deep purple, (5–)7–10(–12) mm, 3(–5)-lobed, rarely entire; stamens 6; fruit halves (0.8–)1–1.2

(–1.5) × (0.6–)0.7–0.8(–1) cm; wings 1–2 mm wide; locule 7–12 × 5–8 mm; seeds 4.5–6 × 3–4 mm 1. *M. delavayi*

2b. Petals yellow, 4–6(–7) mm, entire; stamens (8–)12–16(–24); fruit halves 3–4 × 2.5–3 cm; wings 5–10(–18)

mm wide; locule 15–2(–28) × 12–17 mm; seeds 14–17 × 7–11 mm ..... 3. *M. polyandra*

**1. *Megacarpaea delavayi*** Franchet, *Bull. Soc. Bot. France* 33: 406. 1886.

高河菜 *gao he cai*

*Megacarpaea delavayi* f. *angustisecta* O. E. Schulz; *M. delavayi* var. *grandiflora* O. E. Schulz; *M. delavayi* f. *microphylla* O. E. Schulz; *M. delavayi* var. *minor* W. W. Smith; *M. delavayi* f. *pallidiflora* O. E. Schulz; *M. delavayi* var. *pinnatifida* Danguy.

Herbs perennial, 15–86 cm tall. Trichomes retrorse, flattened, not crisped. Root cylindrical, to 2 cm in diam. Caudex short, simple or rarely branched. Stems erect, branched above. Petiole of basal and lower cauline leaves (1–)2–5(–8) cm, considerably flattened at base; leaf blade oblong-oblanceolate in outline, appearing pinnately compound, (0.5–)5–15(–22) cm, sparsely to densely pubescent; lateral lobes 7–13 on each side of rachis, broadly ovate, oblong, or linear, (0.5–)1–2.5(–4.6) × 0.1–1(–2) cm, base decurrent, margin entire, irregularly serrate, or lacinate, apex acute or obtuse. Cauline leaves sessile, strongly auriculate or amplexicaul at base; leaf blade similar to that of basal leaves but with fewer lobes. Fruiting pedicels slender, (0.6–)0.8–1.5(–2) cm, usually strongly recurved, pubescent. Sepals purplish, oblong, 3–4(–4.5) × (1–)1.5–2(–2.5) mm, sparsely pubescent or glabrous. Petals lavender or deep purple, narrowly oblanceolate, oblong, or broadly obovate, entire or shallowly to deeply 3(–5)-lobed, (5–)7–10(–12) × (1–)3–4(–6) mm, base

cuneate, apex rounded or subacute. Stamens 6; filaments (2.5–)3–4 mm; anthers narrowly oblong or linear, 1–1.5 mm. Fruit halves broadly obovate, (0.8–)1–1.2(–1.5) cm × (6–)7–8(–10) mm; wings 1–2 mm wide; replum 2.5–4 mm; locule 7–12 × 5–8 mm. Seed dark brown, broadly ovate, 4.5–6 × 3–4 mm. Fl. May–Aug, fr. Jul–Sep.

Swampy meadows, grassy slopes, open thickets; 3300–4800 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan [Myanmar].

All of the synonyms above represent formal recognition of only a small portion of the enormous variation in *Megacarpaea delavayi*. The species is most variable in leaf morphology, flower size, petal shape and apex, and fruit shape and size. However, the variation in all of these characters is continuous in nature and does not show any correlation with geography. Therefore, it is more practical not to recognize any infraspecific taxa. The species is recorded here for the first time from Xizang and Myanmar; the records are based on *Forrest 4342* (E) and *Forrest 26890* (E, NY, US), respectively. This species is used for medicine and as a vegetable.

**2. *Megacarpaea megalocarpa*** (Fischer ex de Candolle) Schischkin ex B. Fedtschenko in Komarov, *Fl. URSS* 8: 543. 1939.

大果高河菜 *da guo gao he cai*

*Biscutella megalocarpa* Fischer ex de Candolle, *Ann. Mus. Natl. Hist. Nat.* 18: 296. 1811; *Megacarpaea angulata* de Candolle; *M. laciniata* de Candolle; *M. mugodzhatica* Goloskokov & Vassilchenko.

Herbs perennial, 20–30(–40) cm tall. Trichomes sparse to dense, flattened, crisped. Roots napiform, to 4 cm wide. Caudex short, covered with fibrous petiolar remains of previous years. Stems erect, stout,

divaricately branched above, glabrescent. Petiole of basal leaves 2–6 cm; leaf blade oblanceolate, (5–)8–16 × (1–)2.5–4 cm, densely pubescent, margin pinnatisect, with 4–7 lateral lobes on each side; lobes irregularly lacinate. Cauline leaves sessile; leaf blade similar to basal but smaller. Inflorescences paniculate, with sessile bracts at branching. Flowers irregularly unisexual. Fruiting pedicels stout, straight, divaricate or ascending, 5–10(–15) mm, pubescent. Sepals and petals present in male flowers, absent in female ones. Sepals narrowly oblong, 5–7 × 2–2.5 mm, margin white, scarious, sparsely pubescent. Petals lavender, linear-oblong, 1–1.5 cm × 3.5–4.5 mm, base attenuate, apex obtuse. Intermediate flowers sometimes present, with whitish petals, and stamens and pistil developed to various degrees. Filaments 3–4 mm; anthers linear, 2–2.5 mm. Fruit halves suborbicular, (1–)1.2–1.8(–2) cm in diam.; wings 3–7 mm wide; locule suborbicular, 6–10 × 5–7 mm; replum 4–7 mm; style 0.5–1 mm. Seeds flattened, suborbicular, 5–7 × 3.5–5 mm. Fl. Apr, fr. May–Jun.

Sandy deserts, alkaline flats. Qinghai, Xinjiang [Kazakstan, Kyrgyzstan, Russia, Uzbekistan].

**3. *Megacarpaea polyandra*** Bentham, Hooker's J. Bot. Kew Gard. Misc. 7: 356. 1855.

多蕊高河菜 *duo rui gao he cai*

Herbs perennial, (0.5–)1–2 m tall, tomentose above. Root to 15 cm in diam. Trichomes flattened, crisped. Caudex considerably thickened. Stems erect, branched above. Basal and lower cauline leaves oblong or oblanceolate in outline, pinnatisect, 15–60 cm, glabrous or sparsely pubescent; lateral lobes 6–12 on each side, oblong or lanceolate, 6–20 × 1–5 cm, base decurrent, margin serrulate, sinuate-dentate, or subentire, apex acuminate. Upper cauline leaves auriculate, similar to lower ones but gradually reduced in size. Fruiting pedicels slender, 1.5–4 cm, strongly recurved, pubescent. Sepals yellowish, oblong, 3.5–5(–6) × 1.5–2.5 mm, sparsely pubescent or glabrous. Petals pale yellow, oblong or obovate, entire, 4–6(–7) × 2–4 (–6) mm, base cuneate, apex rounded to subacute; claw 1–2 mm. Stamens (8–)12–16(–24); filaments 3.5–5 mm; anthers narrowly oblong, 1–1.3 mm. Fruit halves suborbicular to obovate-orbicular, 3–4 × 2.5–3 cm; wings 5–10(–18) mm wide; replum 7–16 mm; locule 1.5–2(–2.8) × 1.2–1.7 cm. Seeds brown, broadly ovate, 1.4–1.7 × 0.7–1.1 cm. Fl. May–Aug, fr. Aug–Oct. Slopes, rocky areas, along streams; 3000–4600 m. Xizang [India, Kashmir, Nepal, Pakistan].

*Megacarpaea bifida* Bentham, a little-collected and poorly known species endemic to Kashmir, is probably conspecific with (or at most infraspecific under) *M. polyandra*. It has entire leaf lobes and slightly elongated fruit halves. *Megacarpaea polyandra* is the only species in the Brassicaceae with flowers having more than six stamens.

The young leaves are cooked as a vegetable.

