

**46. BARBAREA R.** Brown in W. T. Aiton, Hortus Kew. 4: 109. 1812, nom. cons.

山芥属 shan jie shu

Herbs biennial or perennial, with rhizomes or woody caudex, rarely annuals. Trichomes simple or absent. Stems erect, sometimes prostrate, angular. Basal leaves rosulate or not, lyrate-pinnatifid or pinnatisect, rarely undivided. Cauline leaves petiolate or sessile, auriculate or amplexicaul, entire, dentate, pinnatifid, or pinnatisect. Racemes many flowered, often ebracteate; rachis striate. Fruiting pedicels slender or thickened, erect or divaricate. Sepals oblong or linear, erect or spreading, base of lateral pair saccate. Petals yellow, rarely creamy white; blade spatulate or oblanceolate, apex obtuse or rounded; claw obscurely differentiated. Stamens 6, tetradynamous; filaments not dilated at base; anthers oblong, obtuse at apex. Nectar glands 4, median pair toothlike; lateral pair annular. Ovules 10–40 per ovary. Fruit dehiscent siliques, linear or rarely elliptic-linear, terete, 4-angled, or latiseptate, sessile or shortly stipitate; valves with a prominent midvein and distinct marginal veins, mostly glabrous, smooth or torulose; replum rounded; septum complete; style obsolete or to 5 mm; stigma capitate, entire or slightly 2-lobed. Seeds uniseriate or subbiseriate, wingless, margined, or winged, oblong, ovoid, or orbicular, plump or slightly flattened; seed coat reticulate, rarely tuberculate, not mucilaginous when wetted; cotyledons accumbent.

About 22 species: mainly in SW Asia, Australia, Europe, and North America; five species (two endemic, one introduced) in China.

- 1a. Terminal lobe of basal and lowermost cauline leaves nearly as large as adjacent lateral lobes; uppermost cauline leaves with (4–)6–10(–12) lateral lobes; plants perennial ..... 1. *B. taiwaniana*
- 1b. Terminal lobe of basal and lowermost cauline leaves much larger than adjacent lateral lobes; uppermost cauline leaves unlobed or with 1–4 lateral lobes; herbs annual or biennial, rarely perennial.
  - 2a. Fruit strongly compressed, 2–2.5 wide; valve apex retuse; seeds 1.6–2 × 1.4–1.7 mm, winged all around ..... 2. *B. hongii*
  - 2b. Fruit terete, quadrangular, or slightly compressed, 1–1.8(–2) mm wide; valve apex obtuse or subacute; seeds smaller, wingless.
    - 3a. Uppermost cauline leaves pinnatisect into linear or linear-oblong lateral lobes; fruit 1.5–1.8(–2) mm wide ..... 4. *B. intermedia*
    - 3b. Uppermost cauline leaves undivided, dentate, or lyrate-pinnatifid into oblong or ovate lateral lobes; fruit 1–1.5 mm wide.
      - 4a. Style in fruit stout, 0.5–1(–1.2) mm; uppermost cauline leaves usually lyrate-pinnatifid 3. *B. orthoceras*
      - 4b. Style in fruit slender, 1.5–3 mm; uppermost cauline leaves undivided ..... 5. *B. vulgaris*

**1. *Barbarea taiwaniana*** Ohwi, Repert. Spec. Nov. Regni Veg. 36: 50. 1934.

台湾山芥 tai wan shan jie

Herbs perennial, (6–)10–20(–35) cm tall. Caudex apically branched or simple in younger plants, often with petiolar remains or previous years. Stems erect or rarely decumbent when many branched from base, angled, glabrous throughout. Basal and lowermost cauline leaves petiolate; petiole (2–)3–7(–10) cm, ciliate at least basally, grooved adaxially; leaf blade (2–)3–5(–9) cm, pinnatisect, with (3–)5–8(–10) lobes on each side of midvein, somewhat fleshy; lateral lobes oblong or ovate, (2–)5–10(–15) × (1–)3–6(–10) mm, entire or obtusely lobed; terminal lobe about as large as lateral ones. Cauline leaves pinnatisect, with (4–)6–10(–12) lateral lobes, petiolate, reduced in size and sessile upward, conspicuously auriculate; auricles ovate or oblong, to 12 × 5 mm, ciliate, base rounded, entire or rarely tooth-ed; lateral lobes linear, narrowly oblanceolate, oblong, or rarely ovate, to 15 × 5 mm, glabrous, entire or usually lobed or obtusely toothed on proximal margin; terminal lobe mostly 3-lobed. Racemes ebracteate, slightly elongated in fruit. Sepals

yellowish, usually tinged purple at middle, oblong, 3–4 × 1–1.5 mm, erect, margin scarios, lateral pair slightly saccate. Petals yellow, oblanceolate, rounded, 5–7 × 2–2.5 mm, attenuate to base. Filaments yellow, 3–4 mm; anthers oblong, ca. 1 mm. Fruiting pedicels erect-ascending, 3–6(–10) mm, angled to subterete, glabrous. Fruit linear, (1–)1.5–2.5 cm × (1.5–)2–2.5 mm, compressed, somewhat torulose, somewhat appressed to rachis; gynophore 0.2–0.5 mm; valves apex obtuse or retuse; style stout or slender, 0.5–2 mm. Seeds yellowish brown, broadly ovate or suborbicular, 1.5–2 × ca. 1 mm, uniseriate or subbiseriate, somewhat compressed, often winged all around, wing to 0.2 mm wide. Fl. Jun–Jul, fr. Aug–Sep.

• Above timberline in rock crevices, under *Abies*, sunny rocky areas; 3200–4000 m. Taiwan.

The illustration and description of *Barbarea taiwaniana* in FRPS represent plants of *B. orthoceras*.

**2. *Barbarea hongii*** Al-Shehbaz & G. Yang, Acta Phytotax. Sin. 38: 71. 2000.

洪氏山芥 hong shi shan jie

Herbs annual or biennial, 35–60 cm tall. Stems erect, angled, glabrous throughout. Basal leaves not seen;

lowermost cauline leaves petiolate; petiole 2.5–6 cm, glabrous; leaf blade 4–7 cm, lyrate-pinnatifid, with 1–3 lobes on each side of midvein, not fleshy; lateral lobes oblong or ovate, 2–10 × 1–5 mm, entire; terminal lobe oblong or ovate, considerably larger than lateral ones, 2–3 × ca. 1.5 cm. Cauline leaves usually with 1 lateral lobe on each side, with the uppermost unlobed, obtusely toothed, sessile, conspicuously auriculate; auricles narrowly oblong, to 10 × 3 mm, only sparsely ciliate, entire; lateral lobes oblong, to 10 × 3 mm, glabrous, entire; terminal lobe much larger than lateral ones, ca. 3 × 1 cm, repand or obtusely dentate. Fruiting racemes ebracteate, elongated considerably. Flowers not seen. Fruiting pedicels erect, appressed to stem, 4–7 mm, terete or subquadrangular, glabrous, slender, much narrower than fruit. Fruit linear, 1.2–3 cm × 2–2.5 mm, strongly flattened and latiseptate, torulose, erect; gynophore to 0.5 mm; valves apex retuse; style stout, 0.7–1.3 mm, slightly compressed. Seeds brown, broadly ovate or suborbicular, 1.6–2 × 1.4–1.7 mm, uniseriate, strongly compressed, winged all around; wing 0.1–0.3 mm wide. Fr. Jul.

• Basaltic rock; ca. 1700 m. Jilin.

This species is known only from the type collection.

**3. *Barbarea orthoceras*** Ledebour, Index Sem. Hort. Dorpat. 2. 1824.

山芥 shan jie

*Barbarea americana* Rydberg; *B. cochlearifolia* H. Boissieu; *B. hondoensis* Nakai; *B. orthoceras* var. *formosana* Kitamura; *B. patens* H. Boissieu; *B. vulgaris* R. Brown var. *orthoceras* (Ledebour) Regel. Herbs biennial or perennial, (10–)20–60(–100) cm tall. Stems erect, angled, glabrous throughout. Basal and lowermost cauline leaves petiolate; petiole (0.5–)1–5(–7) cm, glabrous or rarely ciliate basally; leaf blade (1–)1.5–4(–6) cm, lyrate-pinnatifid, with (1 or)2–4(–6) lobes on each side of rachis, rarely unlobed, not fleshy; lateral lobes oblong or ovate, 2–10 × 1–5 mm, entire; terminal lobe considerably larger than lateral ones, 1.5–5 × 1–2.5 cm. Cauline leaves usually lyrate-pinnatifid, with 1–4 lateral lobes, rarely coarsely toothed, sessile, conspicuously auriculate; auricles ovate or narrowly oblong, to 8 × 5 mm, ciliate, entire; lateral lobes oblong or ovate, rarely lanceolate, to 2 × 1 cm, glabrous, entire; terminal lobe much larger than lateral ones, to 5 × 3 cm, entire, repand, or rarely dentate. Racemes ebracteate, elongated considerably in fruit. Sepals yellow, oblong, 2.5–3.5 × 1–1.5 mm, erect, margin scarious, lateral pair slightly saccate. Petals yellow or pale yellow, oblanceolate, rounded, (3–)4–5(–6) × 1.5–2 mm, attenuate to base. Filaments yellow, 3–4.5 mm; anthers oblong, ca. 1 mm. Fruiting pedicels erect or ascending, (2–)3–6(–7) mm, terete or subquadrangular, glabrous, stout, slightly narrower than fruit. Fruit linear, (1.5–)2–4(–5) cm × 1.2–1.5 mm, terete-subquadrangular, torulose, erect to erect-ascending; gynophore to 0.3 mm; valves apex obtuse to subacute; style stout, 0.5–1(–1.2)

mm. Seeds brown, ovate or oblong, 1.2–1.5 × 0.9–1 mm, uniseriate, somewhat plump, wingless. Fl. Jun–Jul, fr. Aug–Sep.  $2n = 16$ .

Open grasslands, scree, temperate mixed forests, river and stream-sides, moist grassy slopes; 400–2100 m. Gansu, Heilongjiang, Jilin, Liaoning, Nei Mongol, Taiwan, Xinjiang [Japan, Korea, Mongolia, Russia; North America].

**4. *Barbarea intermedia*** Boreau, Fl. Centre France 2: 48. 1840.

羽裂山芥 yu lie shan jie

Herbs biennial, 15–60 cm tall. Stems erect, angled, glabrous. Basal and lowermost cauline leaves petiolate; petiole 0.5–3(–4.5) cm, glabrous or ciliate; leaf blade 1.5–7 cm, lyrate-pinnatifid, with 1–4(–7) lobes on each side of midvein, not fleshy; lateral lobes oblong or ovate, 3–10(–15) × 1–5(–7) mm, entire or repand; terminal lobe ovate, considerably larger than lateral ones, 1–3 × 0.7–1.5 cm. Cauline leaves pinnatifid or pinnatisect, with 1–4 lateral lobes, entire, sessile, conspicuously auriculate; auricles ovate or narrowly oblong, to 10 × 5 mm, ciliate; lateral lobes linear to linear-oblong, to 2.5 × 0.5 cm, glabrous or ciliate, entire; terminal lobe obovate-oblong, larger than lateral lobes and to 4 × 1.5 cm, entire or repand or rarely dentate. Racemes ebracteate, elongated considerably in fruit. Sepals yellow, oblong, 2–3 × 1–1.3 mm, erect, margin scarious, lateral pair slightly saccate. Petals yellow, oblanceolate, rounded, 4–6 × 1–1.5 mm, attenuate to base. Filaments yellow, 3–4 mm; anthers oblong, ca. 1 mm. Fruiting pedicels erect or ascending, rarely divaricate, (2–)3–5 mm, terete or subquadrangular, glabrous, stout, slightly narrower than fruit. Fruit linear, (1–)1.5–3 cm × 1.5–1.8(–2) mm, terete or slightly compressed, torulose, erect to erect-ascending; gynophore to 0.5 mm; valves apex acute to subobtusely; style slender or slightly stout, 1–1.5 mm. Seeds brown, ovate to ovate-oblong, 1.2–1.7 × 1–1.2 mm, uniseriate, somewhat plump or slightly compressed, wingless. Fl. Jun–Jul, fr. Jul–Aug.  $2n = 16$ .

Woods, along ditches, streamsides; ca. 4100 m. Xinjiang, Xizang [Bhutan, India, Nepal, Pakistan, Sikkim; native to SW Asia and C Europe].

**5. *Barbarea vulgaris*** R. Brown in W. T. Aiton, Hortus Kew. 4: 109. 1812.

欧洲山芥 ou zhou shan jie

*Barbarea arcuata* (Opiz ex J. & C. Presl) Reichard; *B. vulgaris* var. *arcuata* (Opiz ex J. & C. Presl) Fries; *Erysimum arcuatum* Opiz ex J. & C. Presl; *E. barbarea* Linnaeus.

Herbs biennial or rarely perennial, glabrous throughout or sparsely hairy. Stems (20–)30–80(–100) cm tall, erect, angled, branched above. Basal and lowermost cauline leaves petiolate; petiole (0.5–)2–8(–12) cm, glabrous or ciliate; leaf blade (1–)2–8(–10) cm, lyrate-pinnatifid, with 1–3(–5) lobes on each side of midvein, rarely early ones undivided, sometimes slightly fleshy; lateral lobes oblong or ovate, 0.3–2(–4) cm × 1–8(–15) mm, entire, repand, crenate, or dentate; terminal lobe

ovate or suborbicular, considerably larger than lateral ones, (0.7–)1.5–4.5 (–7) × (0.4–)1–3(–5) cm. Upper cauline leaves ovate or suborbicular, undivided, coarsely dentate, sinuate, or rarely subentire, sessile, conspicuously auriculate; auricles ovate or narrowly oblong, to 10 × 5 mm, often ciliate. Racemes ebracteate, elongated considerably in fruit. Sepals yellow, oblong, 3–4 × 1–1.5 mm, erect, margin scarious, lateral pair slightly saccate. Petals yellow, spatulate, rounded, 5–6(–7) × 1.5–2 mm, attenuate to base. Filaments yellow, 3–4.5 mm; anthers oblong, 0.7–1.2 mm. Fruiting pedicels divaricate or erect-ascending, 3–7 mm, terete or subquadrangular, glabrous, narrower than fruit. Fruit linear, (0.7–)1.5–3 cm × 1–1.5 mm, terete, somewhat compressed, or 4-angled, torulose, erect to erect-ascending; gynophore to 0.5 mm; valves apex obtuse or subacute; style slender, 1.5–3 mm. Seeds dark brown, broadly ovate or subglobose, 1.2–1.5 × 1–1.2 mm, uniseriate, plump, wingless. Fl. and fr. Apr–Aug.  $2n = 16$ .

Along ditches, river banks, damp grasslands, waste places, roadsides, fields, disturbed sites; 700–4100 m. Heilongjiang, Jiangsu, Jilin, Xinjiang [India, Japan, Kashmir, Kazakstan, Korea, Mongolia, Pakistan, Russia, Sri Lanka, Tajikistan; SW Asia, Europe; naturalized elsewhere].

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