

60. RORIPPA Scopoli, Fl. Carniol. 520. 1760.

沸菜属 han cai shu

Tetrapoma Turczaninow ex Fischer & C. A. Meyer.

Herbs annual, biennial, or perennial, usually of wet or aquatic habitats. Trichomes absent or simple. Stems erect or prostrate, simple or branched, leafy. Basal leaves petiolate, rosulate or not, simple, entire, dentate, sinuate, lyrate, pectinate, or 1–3-pinnatisect. Cauline leaves petiolate or sessile, cuneate, attenuate, auriculate, or sagittate at base, entire, dentate, pinnatifid, or pinnatisect. Racemes ebracteate or rarely bracteate throughout, elongated in fruit. Sepals ovate or oblong, erect or spreading, base of lateral pair not saccate or rarely saccate, margin often membranous. Petals yellow, sometimes white or pink, rarely vestigial or absent; blade obovate, spatulate, oblong, or oblanceolate, apex obtuse or emarginate; claw sometimes distinct, often shorter than sepals. Stamens 6 and tetradynamous, rarely 4 and equal in length; anthers ovate or oblong, obtuse or rarely apiculate at apex. Nectar glands confluent, often subtending bases of all stamens; median glands narrow; lateral glands semiannular and intrastaminal, or annular. Ovules 10–300 per ovary. Fruit dehiscent siliques or silicles, linear, oblong, ovoid, ellipsoid, or globose, terete or slightly latiseptate, sessile or rarely shortly stipitate; valves 2(or 3–6), papery or leathery, veinless or obscurely veined, smooth or torulose; replum rounded; septum complete or rarely perforated, membranous, translucent, veinless; style obsolete or distinct; stigma capitate, entire or slightly 2-lobed. Seeds biseriate or rarely uniseriate, wingless or rarely winged, oblong, ovoid, or ellipsoid, plump; seed coat reticulate, colliculate, rugose, tuberculate, or foveolate, mucilaginous or not when wetted; cotyledons accumbent.

About 75 species: worldwide; nine species in China.

1a. Racemes bracteate throughout or rarely along lowermost third.

2a. Fruiting pedicels slender, 3–6.5(–8) mm; fruit linear, 7–17(–21) × 1.2–1.6 mm; seeds colliculate 4. *R. benghalensis*

2b. Fruiting pedicels stout, (0.3–)0.7–2(–3) mm; fruit oblong, (3–)4.5–8.5(–10) × 1.5–2.5 mm; seeds foveolate 5. *R. cantoniensis*

1b. Racemes ebracteate, rarely lowermost 1 or 2 flowers bracteate.

3a. Fruiting pedicels erect to erect-ascending, subappressed to rachis; fruit valves with a distinct midvein; seeds 1.1–1.5 × 0.7–1.1 mm 6. *R. elata*

3b. Fruiting pedicels ascending, divaricate, or reflexed, not appressed to rachis; fruit valves not veined; seeds 0.4–0.9 × 0.3–0.6 mm.

4a. Fruit globose, oblong, ellipsoid, or oblong-ovoid, length less than 3 × width.

5a. Fruit oblong, ellipsoid, or oblong-ovoid, often slightly curved; seeds colliculate 9. *R. palustris*

5b. Fruit globose or subglobose, not curved; seeds reticulate.

6a. Fruit valves 2, papery; sepals (1–)1.3–1.8(–2) mm; petals 0.7–1.3(–1.5) × 0.3–0.8 mm 7. *R. globosa*

6b. Fruit valves (3 or)4(–6), leathery; sepals 1.6–2.8 mm; petals (1.5–)1.8–3(–3.5) × 0.7–1.8(–2) mm 8. *R. barbareaifolia*

4b. Fruit linear, rarely linear-oblong, length more than 4 × width.

7a. Perennials; middle cauline leaves deeply pinnatisect; fruit rarely producing seeds; seeds colliculate 1. *R. sylvestris*

7b. Annuals; middle cauline leaves lyrate-pinnatifid or undivided; fruit producing numerous seeds; seeds foveolate.

8a. Fruit often curved, (0.7–)1–2.4(–3) cm × 1–1.5(–2) mm; seeds biseriate or nearly so; petals longer than sepals, (2.5–)3–4(–4.5) × 1–1.5 mm, rarely absent 2. *R. indica*

8b. Fruit straight, (1.5–)2.5–4 cm × 0.7–0.9(–1) mm; seeds uniseriate; petals mostly absent, if present then often shorter than sepals and 1.5–2.5 × 0.2–0.7(–1) 3. *R. dubia*

1. *Rorippa sylvestris* (Linnaeus) Besser, Enum. Pl. 27. 1822.

欧亚沸菜 ou ya han cai

Sisymbrium sylvestre Linnaeus, Sp. Pl. 2: 657. 1753;

Nasturtium sylvestre (Linnaeus) R. Brown; *Rorippa liaotungensis* X. D. Cui & Y. L. Chang.

Herbs perennial, (5–)15–80(–100) cm tall, glabrous or sparsely pubescent. Stems prostrate, decumbent, ascending, or suberect, branched mainly basally.

Rosette leaves soon withered, similar to cauline leaves.

Middle cauline leaves petiolate, deeply pinnatisect; petiole not auriculate, rarely minutely auriculate; leaf blade (2–)3.5–15(–20) × (0.7–)1–4.5(–6) cm; lateral lobes 3–6 on each side of midvein, sublinear, lanceolate, oblong, elliptic, or ovate, margin dentate or serrate, sometimes subentire; uppermost leaves with 1–3 lateral lobes or not lobed, often subsessile. Racemes ebracteate. Fruiting pedicels (3–)4–10(–12) mm, slender, divaricate.

Sepals green or yellow, oblong, 1.8–3(–3.5) × 0.7–1.5 mm, ascending or spreading. Petals yellow, spatulate or obovate, (2.2–)2.8–5.5(–6) × 1.5–2.5 mm, apex rounded. Filaments (1.5–)1.8–3.5(–4) mm; anthers oblong, 0.7–1 mm. Ovule number highly variable, mostly aborted. Fruit linear, very rarely oblong-linear, (0.4–)0.7–2(–2.5) cm × (0.7–)1–1.3(–1.6) mm, rarely producing seeds; style 0.5–1 (–1.5) mm; stigma subentire or slightly 2-lobed. Seeds reddish brown, ovoid, colliculate, uniseriate or rarely bisseriate, 0.6–0.9 × 0.4–0.5 mm. Fl. and fr. May–Sep. $2n = 32, 40, 48$.

Along ditches, damp areas, meadows, waste grounds, fields; 100–2000 m. Xinjiang, Liaoning [India, Japan, Kashmir, Russia, Tajikistan, Uzbekistan; SW Asia, Europe; introduced in North and South America].

Although the present authors have not examined the type of *Rorippa liaotungensis*, the detailed description and illustration leave no doubt that it is a synonym of *R. sylvestris*, hundreds of specimens of which were examined from its native and naturalized ranges.

2. *Rorippa indica* (Linnaeus) Hiern, Cat. Afr. Pl. 1: [xxvi]. 1896.

沸菜 han cai

Sisymbrium indicum Linnaeus, Sp. Pl., ed. 2, 2: 917. 1763; *Cardamine glandulosa* Blanco; *C. lamontii* Hance; *Nasturtium atrovirens* (Hornemann) de Candolle; *N. diffusum* de Candolle; *N. indicum* (Linnaeus) de Candolle (1821), not Garsault (1764); *N. montanum* Wallich ex J. D. Hooker & Thomson; *N. sinapis* (N. L. Burman) O. E. Schulz; *Radicula montana* (Wallich ex J. D. Hooker & Thomson) Hu ex C. Pei; *Rorippa atrovirens* (Hornemann) Ohwi & H. Hara; *R. montana* (Wallich ex J. D. Hooker & Thomson) Small; *R. sinapis* (N. L. Burman) Ohwi & H. Hara; *S. atrovirens* Hornemann; *S. sinapis* N. L. Burman.

Herbs annual, (6–)20–60(–75) cm tall, glabrous or rarely sparsely pubescent. Stems often branched basally and apically. Basal leaves withered by flowering. Lower and middle cauline leaves auriculate or not; petiole absent or 1–4 cm; leaf blade lyrate-pinnatifid or undivided, obovate, oblong, or lanceolate, (2.5–)3.5–12(–16) × (0.8–)1.5–4(–5) cm, margin entire, irregularly crenate, or serrate, apex obtuse or subacute; terminal lobe oblong, elliptic, or oblong-lanceolate, to 10 × 5 cm; lateral lobes absent or 1–5(or 6) on each side of midvein. Uppermost leaves usually sessile, auriculate or not; leaf blade lanceolate or oblong, margin entire, denticulate, or serrulate, apex acute or acuminate. Racemes ebracteate. Fruiting pedicels slender, ascending, divaricate, or rarely slightly reflexed, straight, (2–)3–10(–15) mm. Sepals often green or pinkish, ascending, oblong-ovate, 2–3 × 0.8–1.5 mm, margin membranous. Petals yellow, obovate or spatulate, (2.5–)3–4(–4.5) × 1–1.5 mm, rarely absent. Filaments 1.5–3 mm; anthers oblong, 0.5–0.8 mm.

Ovules (60–)70–110 per ovary. Fruit linear, (0.7–)1–2.4(–3) cm × 1–1.5(–2) mm, often curved upward; valves thin papery, not veined; style (0.5–)1–1.5(–2) mm, slender, narrower than fruit. Seeds reddish brown, ovate or ovate-orbicular, 0.5–0.9 × 0.4–0.6 mm, foveolate, biseriate or nearly so. Fl. and fr. throughout the year. $2n = 24^*, 32^*, 48^*$.

Roadsides, field margins, gardens, river banks; near sea level to 3200 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sikkim, Thailand, Vietnam; naturalized in North and South America].

Although the type of *Cardamine lamontii* was collected from Hong Kong (Sep 1874, *J. Lamont s.n.* (holotype, BM)), that name was not listed in FRPS or any other provincial Chinese flora.

This species is used medicinally.

3. *Rorippa dubia* (Persoon) H. Hara, J. Jap. Bot. 30: 196. 1955.

无瓣沸菜 wu ban han cai

Sisymbrium dubium Persoon, Syn. Pl. 2: 199. 1807; *Cardamine sublyrata* Miquel; *Nasturtium dubium* (Persoon) Kuntze; *N. heterophyllum* Blume; *N. indicum* (Linnaeus) de Candolle var. *apetalum* de Candolle; *N. indicum* var. *javanum* Blume; *N. sublyratum* (Miquel) Franchet & Savatier; *Rorippa heterophylla* (Blume) R. O. Williams; *R. indica* (Linnaeus) Hiern var. *apetala* (de Candolle) Hochreutiner; *R. sublyrata* (Miquel) H. Hara.

Herbs annual, (4–)15–33(–45) cm tall, glabrous or rarely sparsely pubescent. Stems often branched basally and apically. Basal leaves withered by flowering. Lower and middle cauline leaves auriculate or not; petiole to 4 cm, rarely absent; leaf blade lyrate-pinnatifid or undivided, obovate, oblong, or lanceolate, (2–)3–11(–15) × (0.5–)1–3(–5) cm, margin entire or irregularly crenate or serrate, apex obtuse or subacute; terminal lobe oblong, elliptic, or oblong-lanceolate, to 14 × 4 cm; lateral lobes absent or 1–4 on each side of midvein. Uppermost leaves usually sessile, auriculate or not; leaf blade lanceolate or oblong, margin entire or serrulate, apex acute or acuminate. Racemes ebracteate. Fruiting pedicels slender, divaricate, straight, (2–)3–8(–10) mm. Sepals often pinkish, ascending, oblong-linear, (2–)2.5–3 × 0.5–0.7 mm, margin membranous. Petals mostly absent, rarely present and linear or narrowly oblanceolate, 1.5–2.5 × 0.2–0.7(–1) mm, often shorter than sepals. Filaments 1.5–2.8 mm; anthers oblong, 0.5–0.8 mm. Ovules 70–90 per ovary. Fruit linear, (1.5–)2.5–4 cm × 0.7–0.9(–1) mm, straight; valves thin papery, not veined; style 0.2–1(–1.5) mm, stout and about as wide as fruit, rarely slender and narrower. Seeds reddish brown, subquadrate or ovate-orbicular, 0.5–0.8 × 0.4–0.6 mm, foveolate, uniseriate. Fl. and fr. throughout the year. $2n = 32^*, 48^*$.

Valleys, waste areas, slopes, roadsides, wet grounds, grassy places, field margins; near sea level to 3700 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Philippines, Sikkim, Thailand, Vietnam; naturalized in North and South America].

4. *Rorippa benghalensis* (de Candolle) H. Hara, J. Jap. Bot. 49: 132. 1974.

孟加拉沸菜 meng jia la han cai

Nasturtium benghalense de Candolle, Syst. Nat. 2: 198. 1821, not Hance (1873); *N. diffusum* de Candolle; *N. indicum* (Linnaeus) de Candolle var. *benghalense* (de Candolle) J. D. Hooker & T. Anderson; *Rorippa dubia* (Persoon) H. Hara var. *benghalensis* (de Candolle) Mukerjee; *R. indica* (Linnaeus) Hiern subsp. *benghalensis* (de Candolle) Bennet; *R. indica* var. *benghalensis* (de Candolle) Debeaux.

Herbs annual, 15–65(–85) cm tall, glabrous or sparsely to densely hirsute, with spreading or retrorse trichomes. Stems simple at base, few to many branched above. Basal leaves soon withered. Lowermost cauline leaves auriculate; petioles to 3 cm; leaf blade oblong or oblong-obovate in outline, lyrate-pinnatifid, (1.5–)2.5–12(–15) × (0.5–)1–4(–6) cm; terminal lobe broadly ovate or oblong, 1–5 × 0.7–3 cm; lateral lobes 1–4, oblong or ovate, to 2 × 1 cm, margin serrate or dentate. Upper leaves sessile, progressively reduced in size upward into bracts. Racemes bracteate throughout or rarely only along proximal third; bracts lanceolate-linear or oblong-linear, subentire or denticulate, minutely auriculate or cuneate at base. Fruiting pedicels ascending or divaricate, slender, straight, 3–6.5(–8) mm. Sepals elliptic or oblong, 1.5–2 × 0.5–0.8 mm. Petals pale yellow, spatulate or oblanceolate, 2–2.5 × 0.5–0.9 mm, apex rounded. Filaments 2–2.5 mm; anthers oblong, 0.4–0.5 mm. Ovules 100–170 per ovary. Fruit linear, straight or curved, 0.7–1.7(–2.1) cm × 1.2–1.6 mm; style 0.3–0.8 mm. Seeds reddish brown, subglobose or broadly ovoid, biseriate, 0.5–0.6 × 0.4–0.5 mm, minutely colliculate. Fl. and fr. Mar–Jul. $2n = 24, 48$.

Streamsides, wet grounds, marsh edges; near sea level to 1500 m. S Yunnan (Jinping Xian, Menglian Dai-Lahu-Va Zu Zizhixian) [Bangladesh, Bhutan, Cambodia, India, Laos, Malaysia, Myanmar, Nepal, Sikkim, Thailand, Vietnam].

Although *Rorippa benghalensis* was first recorded from China by Hooker and Thomson (J. Proc. Linn. Soc., Bot. 5: 139. 1861, as *Nasturtium benghalense*), that record was overlooked by subsequent botanists. The occurrence of the species in China is here confirmed based on Wang 74232 (A), China-Russia Team 156 (KUN), and Yunnan Team 9474 (KUN).

5. *Rorippa cantoniensis* (Loureiro) Ohwi, Acta Phytotax. Geobot. 6: 55. 1937.

广州沸菜 guang zhou han cai

Ricotia cantoniensis Loureiro, Fl. Cochinch. 2: 482. 1793; *Cardamine cryptantha* (A. Richard) Kuntze var. *pinnatodentata* Kuntze; *C. microsperma* (de Candolle) Kuntze; *Nasturtium microspermum* de Candolle; *N. microspermum* var. *vegetius* Bunge; *N. microspermum* var. *macilentum* Bunge; *N. sikokianum* Franchet & Savatier; *N. sikokianum* var. *axillare* Hayata; *Rorippa microsperma* (de Candolle) Handel-Mazzetti.

Herbs annual, (5–)10–35(–45) cm tall, glabrous throughout, sometimes sparsely with semiglobose papillae 0.05–0.1 mm. Stems erect or decumbent, branched basally and above, rarely simple. Basal leaves petiolate, rosulate, soon withered, lyrate, pinnatisect, or bipinnatisect, up to 10 × 3 cm, with up to 12 lateral lobes on each side of midvein. Cauline leaves and bracts sessile or rarely petiolate throughout, auriculate or sagittate at base, lyrate, pinnatisect, or bipinnatisect, rarely sinuate or toothed, (0.8–)1.5–5(–7) × (0.3–)0.8–2.3(–3) cm; lateral lobes 2–6(or 7) on each side of midvein, to 10 × 5 mm, incised, dentate, or entire. Racemes bracteate throughout; bracts rarely adnate to pedicel. Fruiting pedicels stout, ascending, (0.3–)0.7–2(–3) mm. Sepals oblong or subelliptic, 1.5–2(–2.5) × 0.5–0.8 mm. Petals pale yellow, obovate or narrowly spatulate, 2–3(–3.5) × 0.5–1 mm. Filaments 1.5–2 mm; anthers oblong, 0.3–0.4 mm. Ovules 100–230 per ovary. Fruit broadly or narrowly oblong, (3–)4.5–8.5(–10) × 1.5–2.5 mm; valves thin papery, veinless; style 0.1–0.5 mm. Seeds reddish brown, ovate or ovate-reniform, foveolate, biseriate, (0.3–)0.4–0.6 × (0.2–)0.3–0.4 mm. Fl. and fr. Feb–Nov.

Fields, roadsides, valleys, river banks, along irrigation ditches, waste places, damp areas; near sea level to 1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea, Russia (Far East), Vietnam].

6. *Rorippa elata* (J. D. Hooker & Thomson) Handel-Mazzetti, Symb. Sin. 7: 357. 1931.

高沸菜 gao han cai

Barbarea elata J. D. Hooker & Thomson, J. Proc. Linn. Soc., Bot. 5: 140. 1861; *Nasturtium barbareaefolium* Franchet (1888), not Baker (1877), nor (de Candolle) B. Fedtschenko (1912); *N. elatum* (J. D. Hooker & Thomson) Kuntze ex O. E. Schulz.

Herbs annual or short-lived perennial, (20–)30–90(–100) cm tall, sparsely to rarely densely hirsute, glabrous or glabrescent above. Stems erect, simple at base, often branched above. Basal leaves not rosulate, soon withered, petiolate. Lowermost and middle cauline leaves often petiolate; petiole auriculate-amplexicaul at base, (0.5–)1.5–6(–8) cm; leaf blade lyrate or lyrate-pinnatifid, sometimes sinuate or undivided, oblong to oblanceolate, (1.5–)2.5–10(–14) × (0.5–)1–4(–5) cm, margin crenate; lateral lobes 1–5(–8) on each side of midvein, oblong or ovate, to 2.5 × 1.2 cm; terminal lobe oblong or elliptic, to 10 × 4 cm, much larger than lateral

ones. Uppermost cauline leaves sessile, often undivided, crenate or rarely sinuate. Racemes ebracteate, to 20–40 cm in fruit. Fruiting pedicels (5–)6–10 (–13) mm, erect to erect-ascending, subappressed to rachis. Sepals oblong, 2–3 × 1–1.5 mm. Petals yellow, obovate, 3–4 × 1.5–2 mm, apex obtuse. Filaments 2–3 mm; anthers narrowly oblong, 0.8–1 mm. Ovules 36–60 per ovary. Fruit linear or oblong-linear, (0.8–)1.2–2(–2.3) cm × 2.5–4 mm; valves with a distinct midvein and obscure other veins, subleathery, obtuse at both ends or retuse apically; style 0.5–1.5(–2) mm. Seeds brown or yellowish brown, ovate, slightly compressed, biseriate, 1.1–1.5 × 0.7–1.1 mm, colliculate. Fl. May–Aug, fr. Jun–Oct. $2n = 32^*$.

Sunny grasslands, mountain slopes, forest margins, woodlands, streamsides, meadows, shady ditchesides, roadsides; 2300–4500 m. Qinghai, Shaanxi, Sichuan, Xizang, NW Yunnan [Bhutan, Sikkim]. Three-valved fruits are occasionally produced on misidentified plants with 2-valved fruit, as seen in *T. T. Yü 14587* (A, BM).

7. *Rorippa globosa* (Turczaninow ex Fischer & C. A. Meyer) Hayek, Beih. Bot. Centralbl. 27: 195. 1911.

风花菜 feng hua cai

Nasturtium globosum Turczaninow ex Fischer & C. A. Meyer, Index Sem. Hort. Petrop. 1: 35. 1835; *Camelina yunnanensis* W. W. Smith; *Cochlearia globosa* (Turczaninow) Ledebour; *N. cantoniense* Hance. Herbs annual or short-lived perennial, (20–)30–90(–120) cm tall, densely villous or hirsute at least near base, rarely glabrous above. Stems erect, simple at base, branched above. Basal leaves rosulate, soon withered; petiole 1–4 cm; leaf blade lyrate-pinnatifid or subruncinate. Lower and middle cauline leaves sessile, lanceolate, oblanceolate, or oblong, 2.5–10(–15) × 0.3–2.5(–4) cm, hirsute, lyrate-pinnatifid and with 1–3 lateral lobes on each side of midvein, sometimes leaves not lobed, base auriculate or amplexicaul, margin irregularly dentate, incised, or serrate, apex acute; terminal lobe not distinct or well developed and to 8 × 4 cm; uppermost leaves undivided, serrate, dentate, or serrulate. Racemes ebracteate. Fruiting pedicels divaricate, (2–)4–8(–10) mm, straight or slightly recurved, slender, glabrous or hirsute. Sepals oblong, spreading, (1–)1.3–1.8(–2) × 0.5–0.9 mm. Petals yellow, obovate, 0.7–1.3(–1.5) × 0.3–0.8 mm, apex obtuse. Filaments spreading, 1.2–1.8(–2) mm; anthers oblong, 0.4–0.5 mm. Ovules 60–100 per ovary. Fruit globose or subglobose, 2–3(–3.5) × (1.5–)2–3 mm; valves 2, papery, glabrous, not veined; gynophore 0.1–0.4 mm, sometimes absent; style stout, 0.1–0.8(–1) mm. Seeds dark reddish brown, broadly ovate, 0.5–0.8 × 0.4–0.5 mm, reticulate. Fl. and fr. Apr–Nov.

River banks, moist areas, grasslands, railroad embankments; near sea level to 2500 m. Anhui, Fujian, Guangdong, Guangxi, Hebei, Heilongjiang, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Japan, Korea, Mongolia, Russia, Vietnam].

8. *Rorippa barbareaifolia* (de Candolle) Kitagawa, J. Jap. Bot. 13: 137. 1937.

山芥叶沸菜 shan jie ye han cai

Camelina barbareaifolia de Candolle, Syst. Nat. 2: 517. 1821; *Nasturtium barbareaifolium* (de Candolle) B. Fedtschenko (1912), not Baker (1877), nor Franchet (1888); *Rorippa hispida* (Desvaux) Britton var. *barbareaifolia* (de Candolle) Hultén; *Tetrapoma barbareaifolium* (de Candolle) Turczaninow ex Fischer & C. A. Meyer; *T. kruhsianum* Fischer & C. A. Meyer; *T. pyriforme* Seemann.

Herbs annual or biennial, (20–)30–95(–110) cm tall, densely villous or hirsute at least near base, sparsely so or subglabrous above. Stems erect, simple at base, branched above. Basal leaves rosulate, soon withered; petiole 1–7 cm; leaf blade lyrate-pinnatifid or subruncinate. Lower and middle cauline leaves sessile, lanceolate, oblanceolate, or oblong, 2.5–10(–15) × 0.4–2.5(–4.5) cm, villous or hirsute, lyrate-pinnatifid, with 2–7 lateral lobes on each side of midvein, base auriculate or amplexicaul, margin lacinate, irregularly serrate, repand, or entire, apex acute; uppermost leaves undivided, entire or obscurely denticulate. Racemes ebracteate. Fruiting pedicels ascending, (2–)4–12(–14) mm, straight, slender, glabrous or hirsute. Sepals oblong, spreading, 1.6–2.8 × 0.6–1.2 mm. Petals yellow, obovate or spatulate, (1.5–)1.8–3(–3.5) × 0.7–1.8(–2) mm, apex obtuse. Filaments 1.5–2.5 mm; anthers narrowly oblong, 0.5–0.6 mm. Ovules 60–85 per ovary. Fruit globose or subglobose, (2.5–)3.5–6(–6.5) × (2.3–)2.8–4(–4.3) mm; valves (3 or)4(–6), leathery, glabrous, not veined; gynophore 0.3–0.8(–1) mm; style stout, 0.5–1(–1.4) mm. Seeds dark reddish brown, oblong-ovate, 0.5–0.7 × 0.3–0.4 mm, reticulate. Fl. & fr. Mar–Aug. $2n = 16$.

Forest borders, roadsides, moist areas, river banks; 100–2100 m. Heilongjiang, Jilin, Nei Mongol [Mongolia, Russia; North America (Alaska, N Canada)].

9. *Rorippa palustris* (Linnaeus) Besser, Enum. Pl. 27. 1822.

沼生沸菜 zhao sheng han cai

Sisymbrium amphibium Linnaeus var. *palustre* Linnaeus, Sp. Pl. 2: 657. 1753; *Cardamine palustre* (Linnaeus) Kuntze; *Nasturtium densiflorum* Turczaninow; *N. palustre* (Linnaeus) de Candolle; *N. palustre* f. *longipes* Franchet; *N. palustre* f. *stoniferum* Franchet.

Herbs annual or rarely short-lived perennial, (5–)10–100(–140) cm tall, glabrous, rarely hirsute. Stems erect, simple or often branched above, ribbed. Basal leaves rosulate, withered early; leaf blade lyrate-pinnatisect, (4–)6–20(–30) × 1–5(–8) cm. Cauline leaves petiolate or subsessile, auriculate or amplexicaul, lyrate-pinnatisect, (1.5–)2.5–8(–12) × (0.5–)0.8–2.5 (–3) cm; lateral lobes oblong or ovate, smaller than terminal lobe, (1 or)2–6(or 7) on each side of midvein, sometimes absent, margin subentire or irregularly dentate, sinuate,

serrate, or crenate. Racemes ebracteate. Fruiting pedicels divaricate or slightly to strongly reflexed, (2.5–)3–8(–12) mm, slender, straight or curved. Sepals oblong, 1.5–2.4(–2.6) × 0.5–0.8 mm. Petals yellow or pale yellow, spatulate, (1.5–)1.8–2.6(–3) × 0.5–1.3(–1.5) mm. Filaments 1–2.5 mm; anthers ovate, 0.3–0.5 mm. Ovules 20–90 per ovary. Fruit oblong, ellipsoid, or oblong-ovoid, often slightly curved, (2.5–)4–10(–14) × (1.5–)1.7–3(–3.5) mm; valves not veined; style 0.2–1(–1.2) mm. Seeds brown to yellowish brown, ovoid or subglobose, colliculate, biseriate, 0.5–0.9 × 0.4–0.6 mm. Fl. and fr. Mar–Oct. $2n = 32$.

Marshlands, pastures, meadows, roadsides, shores of lakes and ponds, streamsides, thickets, grasslands; near sea level to 4000 m. Anhui, Gansu, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan [Afghanistan, Bhutan, India, Japan, Kazakstan, Korea, Mongolia, Ne-pal, Pakistan, Russia, Sikkim, Tajikistan, Turkmenistan, Uzbekistan; Europe, North America; introduced in Australia, South America, and elsewhere].

All records of *Rorippa islandica* (Oeder ex Murray) Borbás from China are based on misidentified plants of *R. palustris*. Plants of the former are prostrate diploids ($2n = 16$) restricted to Europe and W Russia; they have nonauriculate cauline leaves, sepals and petals 1–1.5 mm, and fruit often 2–3(–5) × longer than the pedicels. By contrast, plants of *R. palustris* are widespread, erect tetraploids ($2n = 32$) with auriculate cauline leaves, sepals and petals 1.5–2.6 mm, and fruit shorter than to 2 × longer than the pedicels.

Rorippa palustris is highly variable and has been divided into as many as four subspecies and seven varieties, all of which are indigenous to North America; only subsp. *palustris* is also indigenous in Eurasia.

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