

## ELATINACEAE

沟繁缕科 *gou fan lü ke*

Yang Qiner (杨亲二)<sup>1</sup>; Gordon C. Tucker<sup>2</sup>

Herbs annual, perennial, or subshrubs, semiaquatic or terrestrial, dwarf. Leaves opposite or verticillate, petiolate; stipules paired; leaf blade simple, margin entire or serrate. Flowers solitary, clustered, or in axillary cymes, bisexual, actinomorphic, small. Sepals 2–5, imbricate, free or slightly united, thinly membranous or with nearly pellucid margins. Petals 2–5, imbricate in bud, free, membranous. Stamens 1 or 2 × as many as sepals, free; anthers dorsifixed, 2-loculed. Ovary superior, 2–5-loculed, many ovuled; placentation axile; styles 2–5, free, short; stigmas capitate. Fruit a septicidal capsule, membranous, leathery, or crustaceous. Seeds numerous, straight or curved, small; testa often rugose; endosperm absent.

Two genera and ca. 50 species: temperate and tropical regions; two genera and six species in China.

Zhang Pengyun & Zhang Yaojia. 1990. *Elatinaceae*. In: Li Hsiwen, ed., *Fl. Reipubl. Popularis Sin.* 50(2): 132–138.

- 1a. Plants terrestrial; flowers 5-merous; capsule 5-septicidal ..... 1. *Bergia*  
1b. Plants aquatic; flowers 2–4-merous; capsule 2–4-septicidal ..... 2. *Elatine*

### 1. *BERGIA* Linnaeus, *Mant. Pl.* 2: 152, 241. 1771.

田繁缕属 *tian fan lü shu*

Herbs annual, perennial, or subshrubs, erect or prostrate, richly branched. Leaves opposite, petiolate; leaf blade margin serrulate. Flowers numerous, arranged in axillary cymes or clustered in leaf-axils, rarely solitary, very small. Sepals 5, free, leathery, with conspicuous midrib, margin membranous, apex long acuminate. Petals 5, free, membranous. Stamens 5–10. Ovary ovoid-globose or subglobose, 5-loculed, many-ovuled, apex subacute; styles short; stigmas capitate. Capsule sub-bony, 5-septicidal. Seeds oblong, slightly curved, reticulate with elliptic pits.

About 25 species: tropical and warm-temperate regions; three species in China.

- 1a. Plants glabrous; stem thick and juicy; flowers numerous in axillary cymes ..... 1. *B. capensis*  
1b. Plants glandular hairy and puberulous; stem neither thick nor juicy; flowers clustered in leaf axils.  
2a. Herbs annual; flowers numerous per leaf axil, pedicel 1–2 mm; stamens 5 ..... 2. *B. ammannioides*  
2b. Herbs perennial or subshrubs; flowers 4 or 5 per leaf axil, pedicel 3–8 mm; stamens (5–)10 ..... 3. *B. serrata*

#### 1. *Bergia capensis* Linnaeus, *Mant. Pl.* 2: 241. 1771.

大叶田繁缕 *da ye tian fan lü*

Herbs annual, 15–30 cm tall. Stem prostrate and rooting in lower part, terete, slightly fleshy, glabrous; branches erect. Stipules ovate-triangular, membranous, margin dentate-sinuate; petiole 1–5 mm, flattened; leaf blade elliptic-lanceolate, obovate-lanceolate, or obovate, 1–4 × 0.2–1 cm, papery, base acuminate, margin minutely serrulate or subentire, apex acute or attenuate. Flowers arranged into small, axillary cymes, subsessile or with short pedicel 1–5 mm, very small. Sepals erect, narrowly lanceolate, 1–2 mm. Petals pink, oblong or subspatulate, subequaling or slightly exceeding sepals. Stamens 10, free; filaments filiform, base slightly widened. Ovary subglobose; styles straight or curved. Capsule subglobose, ca. 1.8 mm in diam., longitudinally 5-grooved, 5-septicidal. Seeds oblong, minute, angular or transversely striate.

Paddy fields, moist places along ditch sides. Guangdong [India, Malaysia, Sri Lanka, Thailand; Africa, SW Asia (Iran), Europe; introduced in tropical America].

#### 2. *Bergia ammannioides* Roxburgh ex Roth, *Nov. Pl. Sp.* 219. 1821.

田繁缕 *tian fan lü*

Herbs annual, 8–30 cm tall. Stem richly branched at base; branches erect or obliquely ascending, densely glandular hairy and puberulous. Stipules 2-fid, ca. 2 mm, submembranous, lobes lanceolate, margin laciniate-denticulate; leaf blade oblanceolate, obovate-lanceolate, or narrowly elliptic, 0.6–2 cm × 2–8 mm, abaxially puberulous and sparsely glandular hairy on veins, adaxially sparsely puberulous or glabrous, base oblique or attenuate, margin serrate, apex acute. Flowers numerous and clustered in leaf axils, small; pedicel 1–2 mm. Sepals narrowly ovate, 1–2 mm, abaxially often villous and glandular hairy, margin membranous, apex acuminate. Petals reddish, narrowly ovate or elliptic, subequaling sepals, apex mucronate. Stamens 5; filaments filiform, base slightly widened. Ovary ovoid; styles 5; stigmas capitate. Capsule subglobose, ca. 2 mm in diam., 5-septicidal. Seeds brown, narrowly ovoid, ca. 0.5 mm, inconspicuously reticulate-striate.

Grassy places along streams, paddy field margins, roadsides. Guangdong, Guangxi, Hainan, Hunan, Taiwan, Yunnan [Laos, Indonesia, Nepal, Tajikistan, Thailand, Vietnam, and probably elsewhere in tropical Asia; tropical Africa, Australia].

#### 3. *Bergia serrata* Blanco, *Fl. Filip.* 387. 1837.

倍蕊田繁缕 *bei rui tian fan lü*

Herbs perennial or subshrubs, 10–30 cm tall. Stem richly

<sup>1</sup> Institute of Botany, Chinese Academy of Sciences, 20 Nanxincun, Xiangshan, Beijing 100093, People's Republic of China.

<sup>2</sup> Department of Biological Sciences, Eastern Illinois University, 600 Lincoln Avenue, Charleston, Illinois 61920-3099, U.S.A.

branched at base, reddish, glandular hairy and white villous; branches often prostrate on ground in lower part. Leaves subsessile; stipules 2-fid, ca. 3 mm, submembranous, lobes lanceolate, margin lacinate-denticulate; leaf blade papery, oblong to oblong-lanceolate, 1–3 cm, both surfaces subglabrous or abaxially slightly puberulous, base attenuate, decurrent, margin serrulate, apex acute or acuminate. Flowers usually 4 or 5 clustered in leaf axils; pedicel slender, 3–8 mm, puberulous or

glandular hairy. Sepals green, narrowly elliptic or lanceolate, ca. 3 mm, apex acute or acuminate. Petals reddish, obovate or elliptic, ca. 2.5 mm, apex acute. Stamens (5 or 7–)10. Ovary ovoid; styles 5; stigmas capitate. Capsule ovoid, 2–2.5 mm, 5-septical. Seeds ovoid, minute, reticulate-striate.

Grasslands on mountain slopes, dry fields, roadsides. Guangdong, Guangxi, Hainan, Taiwan [Philippines].

## 2. ELATINE Linnaeus, Sp. Pl. 1: 367. 1753.

沟繁缕属 *gou fan lü shu*

Herbs annual, aquatic. Stem prostrate, slender, rooting at nodes. Leaves opposite or verticillate, shortly petiolate; leaf blade small, margin usually entire. Flowers usually only 1 per node, very small. Sepals 2–4, united at base, membranous, apex subacute. Petals 2–4, longer than sepals, apex obtuse. Stamens 1 or 2 × as many as petals. Ovary globose, compressed, 2–4-loculed, apex truncate; ovules numerous; styles 2–4; stigmas capitate. Capsule membranous, 2–4-septical. Seeds straight, curved, or horseshoe-shaped, surface reticulate-striate with hexagonal or elliptic pits.

About 25 species: tropical, subtropical, and temperate regions; three species in China.

- 1a. Sepals and petals 4; stamens 8; capsule 4-septical; seeds horseshoe-shaped ..... 1. *E. hydropiper*  
 1b. Sepals and petals 3; stamens 3; capsule 3-septical; seeds nearly straight or slightly curved.  
 2a. Flowers sessile or shortly pedicellate, pedicel 0.3–0.4 mm, conspicuously shorter than petals ..... 2. *E. triandra*  
 2b. Flowers conspicuously pedicellate, pedicel 1.5–2.5 mm, 1–2 × as long as petals ..... 3. *E. ambigua*

### 1. *Elatine hydropiper* Linnaeus, Sp. Pl. 1: 367. 1753.

马蹄沟繁缕 *ma ti gou fan lü*

Plants 2–4 cm tall. Branches ascending. Leaves opposite; stipules small, slightly conspicuous; petioles on upper part of stem shorter, those on lower part longer; leaf blade oblong, oblong-elliptic, or spatulate, 2–5 × ca. 0.5 mm, base attenuate into petiole, margin entire, apex obtuse. Flowers solitary in leaf axils, subsessile or very shortly pedicellate. Sepals 4, oblong, 0.6–7(–0.9) × ca. 0.3 mm, apex rounded. Petals 4, obovate or broadly elliptic, 0.8–1 × ca. 0.4 mm, slightly longer and wider than sepals, apex rounded. Stamens 8, shorter than petals. Ovary 4-loculed; styles 4. Capsule compressed globose, ca. 2 mm in diam., 4-septical. Seeds horseshoe-shaped, 0.5–0.7 mm, finely and densely hexagonal reticulate-striate.

Pools, water on river banks, marshy places. Heilongjiang, Jilin, Liaoning [Russia (Siberia); Europe].

### 2. *Elatine triandra* Schkuhr, Bot. Handb. 1: 345. 1791.

三蕊沟繁缕 *san rui gou fan lü*

Plants 2–10 cm tall. Stem richly branched, terete, weak; internodes short. Leaves opposite; stipules caducous, triangular or ovate-lanceolate, 0.7–1 mm, membranous, apex acute; petiole 0.5–3 mm or absent; leaf blade ovate-oblong or lanceolate to linear-lanceolate, 3–10 × 1.5–3 mm, submembranous, adaxially glabrous, base attenuate, margin entire, apex obtuse; lateral veins 2- or 3-paired, minute. Flowers axillary, solitary, sessile, subsessile, or shortly pedicellate and then pedicel 0.3–0.4 mm at fruiting stage. Sepals 2 or 3, ovate, 0.5(–0.7) mm, connate at

base, apex obtuse. Petals 3, white or reddish, broadly ovate or elliptic, slightly longer than sepals. Stamens 3, shorter than petals. Ovary compressed globose, 3-loculed; styles 3, erect, free, short. Capsule compressed globose, 1–1.5 mm in diam., 3-septical. Seeds oblong, nearly straight or slightly curved, ca. 0.5 mm, finely and densely hexagonal reticulate-striate.

Pools, streams, paddy fields, marshy places. Guangdong, Heilongjiang, Jilin, Taiwan [India, Indonesia, Japan, Malaysia, Nepal, Philippines; Australia, Europe, North America, Pacific islands (New Zealand)].

### 3. *Elatine ambigua* Wight in Hooker, Bot. Misc. 2: 103. 1830.

长梗沟繁缕 *chang geng gou fan lü*

Plants 1.5–3 cm tall. Stem richly branched. Leaves subsessile or shortly petiolate; stipules lanceolate, ca. 1 mm, membranous, margin dentate, apex acute; petiole (if present) ca. 1 mm; leaf blade spatulate, lanceolate to ovate-lanceolate, or elliptic, 2–5 × ca. 0.7 mm, margin entire, apex subacute. Flowers axillary, solitary; pedicel conspicuous, curved downward at fruiting stage, 1.5–2.5 mm. Calyx 3-fid; lobes oblong-ovate or broadly lanceolate, ca. 0.5 × 0.3 mm, apex obtuse. Petals 3, reddish, long elliptic, elliptic, or ovate, 1–1.5 × ca. 0.5 mm, 2–3 × as long as sepals. Stamens 3, shorter than petals. Ovary obovoid, 3-loculed; styles 3. Capsule cylindrical-ovoid, 3-septical. Seeds nearly straight or slightly curved, ca. 0.5 mm, reticulate-striate.

Lakes, pools, marshy places. Yunnan [Bhutan, India, Indonesia, Malaysia, Vietnam; naturalized in Australia, Europe, and North America (California)].