

15. LIMNOPHILA R. Brown, Prodr. 442. 1810.

石龙尾属 shi long wei shu

Herbs, annual or perennial, in marshy areas or aquatic, often aromatic when bruised, with transparent dots. Stems erect, prostrate, or creeping, simple or much branched. Submerged leaves in aquatic species whorled, pinnately parted to capillary-multiparted, glabrous. Aerial leaves opposite to whorled, sessile or petiolate; leaf blade lanceolate or pinnately divided, glandular punctate, margin entire to serrate, if leaf undivided then veins pinnate or parallel. Flowers axillary and solitary or in axillary or terminal spikes or racemes, sessile or pedicellate. Bracteoles 2 or absent. Calyx tubular; lobes subequal or upper lobe larger than others. Corolla tubular or funnellform, 2-lipped; lower lip 3-lobed; upper lip entire or 2-lobed. Stamens 4, included, didynamous; anther locules stipitate. Ovary glabrous. Stigma 2-lamellate. Capsule included within calyx, septicidal. Seeds minute, numerous.

About 40 species: tropical to subtropical Africa, Asia, Australia, and Pacific Islands; ten species in China.

1a. Plants with both submerged and aerial leaves.

2a. Aerial leaves undivided, 3–5-veined 4. *L. heterophylla*

2b. Aerial leaves divided, 1–3-veined.

3a. Pedicel often as long as calyx or longer; bracteoles 1.5–3.5 mm; corolla 1–1.4 cm 3. *L. indica*

3b. Pedicel lacking or rarely to 1.5 mm; bracteoles absent or to 1.5 mm; corolla less than 1 cm.

4a. Stems and calyx glandular hairy; calyx ca. 2 mm; corolla ca. 4 mm 2. *L. borealis*

4b. Stems and calyx eglandular hairy; calyx 4–6 mm; corolla 6–10 mm 1. *L. sessiliflora*

1b. Plants with aerial leaves only.

5a. Leaf veins parallel 5. *L. connata*

5b. Leaf veins pinnate or only midrib conspicuous.

6a. Calyx smooth or with 5 raised veins in fruit; bracteoles lacking 6. *L. rugosa*

6b. Calyx with numerous raised veins in fruit; bracteoles present.

7a. Fruiting pedicel recurved 10. *L. erecta*

7b. Fruiting pedicel not recurved.

8a. Pedicel 5–20 mm 7. *L. aromatica*

8b. Pedicel 0.5–5 mm.

9a. Pedicel 3–5 mm, villous to subglabrous; corolla 1–1.5 cm 8. *L. chinensis*

9b. Pedicel 0.5–3 mm, hispidulous; corolla 0.5–1 cm 9. *L. repens*

1. *Limnophila sessiliflora* (Vahl) Blume, Bijdr. 749. 1826.

石龙尾 shi long wei

Hottonia sessiliflora Vahl, Symb. Bot. 2: 35. 1791;

Ambulia sessiliflora (Vahl) Baillon ex Wettstein; *L.*

taoyuanensis Yang & Yen.

Perennials, amphibious. Submerged stems slender, long, glabrous or subglabrous. Aerial stems 6–40 cm, simple or sparsely branched, eglandular hairy, rarely subglabrous. Submerged leaves 0.5–3.5 cm, multiparted; segments flattened or capillary. Aerial leaves whorled; leaf blade elliptic-lanceolate, 5–18 × 3–4 mm, glabrous, densely glandular punctate, margin crenate to lobed; veins 1–3. Flowers sessile or rarely with a pedicel to 1.5 mm, solitary in axils of submerged and aerial leaves. Bracteoles absent or rarely present and to 1.5 mm. Calyx 4–6 mm, eglandular hairy, without raised veins in fruit; lobes 2–4 mm, ovate, apex narrowly acuminate. Corolla purple-blue to reddish, 6–10 mm. Capsule compressed, subglobose. Fl. and fr. Jul–Jan.

Ponds, swamps, rice fields, wet places along streams; below 1900 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hunan, Jiangsu, Jiangxi, Liaoning, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Indonesia (Java), Japan, Korea, Malaysia, Myanmar, Nepal, Sikkim, Sri Lanka, Vietnam].

Limnophila trichophylla (Komarov) Komarov has been reported from NE China and Taiwan. From illustrations and the original description, the species is similar to *L. sessiliflora*, but we have not seen any specimens. The same is true for the recently described *L. taoyuanensis* (Bot. Bull. Acad. Sinica 38: 285–295. 1997).

2. *Limnophila borealis* Y. Z. Zhao & Ma f., Acta Sci. Nat. Univ. Intramagol. 21: 137. 1990.

北方石龙尾 bei fang shi long wei

Perennials, amphibious. Stems slender, long, glandular. Submerged leaves whorled; leaf blade bipinnately segmented; segments capillary. Aerial leaves pinnately lobed; leaf blade 0.5–3 cm, glabrous, densely glandular; vein 1. Flowers in axil of each leaf, solitary, sessile at first, then pedicel elongating to 2–6 mm in fruit, densely glandular. Bracteoles absent. Calyx narrowly campanulate, ca. 2 mm, outside densely glandular; lobes triangular-lanceolate, ca. 1 mm, apex acute. Corolla reddish, funnellform, ca. 4 mm. Capsule subglobose, ± compressed, ca. 3 mm; persistent calyx as long as capsule. Seeds black-brown, oblong, ca. 0.4 mm. Fl. and fr. Jul–Sep.

• Rice fields; low elevations. Nei Mongol (Hinggan Meng).

3. *Limnophila indica* (Linnaeus) Druce, Bot. Soc. Exch. Club Brit. Isles 3: 420. 1914.

有梗石龙尾 you geng shi long wei

Hottonia indica Linnaeus, Sp. Pl. ed. 2, 208. 1762;
Linnophila gratioloides R. Brown.

Perennials, amphibious. Submerged stems much branched, glabrous. Aerial stems to 15 cm, simple or branched, glabrous, with stalked or sessile glands to nearly smooth. Submerged leaves whorled, 1.5–2.5 cm, pinnatisect; segments flattened to capillary. Aerial leaves usually whorled, pinnately lobed, 0.4–2 cm, sometimes few opposite and crenate. Flowers axillary from aerial leaves, solitary. Pedicel slender, 2–10 mm, usually longer than bract, with sessile or stalked glands. Bracteoles 2, 1.5–3.5 mm, margin entire or sparsely serrate, apex acute. Calyx 3.5–5 mm, with sessile glands, without raised veins in fruit; lobes 2–3 mm, ovate to lanceolate, apex short acuminate. Corolla white, pale purple, or red, 1–1.4 cm. Capsule dark brown, compressed, ellipsoid to subglobose, ca. 3 mm. Fl. and fr. Mar–Nov.

Ponds, wet places; below 1800 m. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Cambodia, India, Indonesia, Japan, Laos, Malaysia, Nepal, Pakistan, Sikkim, Sri Lanka, Thailand, Vietnam; Africa, SW Asia, Australia, Oceania].

4. *Linnophila heterophylla* (Roxburgh) Benth. Scroph. Ind. 25. 1835.

异叶石龙尾 yi ye shi long wei

Columnnea heterophylla Roxburgh, Fl. Ind. ed. 1832, 3: 97. 1832.

Perennials, aquatic. Aerial stems with sessile glands or pilose or nearly smooth and glabrous. Submerged leaves to 50 cm, multiparted; segments capillary. Aerial leaves opposite or whorled, sessile, oblong, ca. 15 × 3 mm, glabrous, base subamplexicaul, margin subcrenate; veins 3–5, parallel. Flowers sessile and in terminal spikes or short pedicellate and solitary in leaf axils. Bracteoles absent. Calyx ca. 3 mm, with sessile glands, without raised veins in fruit. Corolla pale purple, ca. 5 mm, glabrous. Capsule pale brown, subglobose, ca. 2.5 mm. Fl. Jul.

Rice fields, brackish waters; low elevations. Anhui, Guangdong, Jiangxi, Taiwan [Cambodia, India, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

5. *Linnophila connata* (Buchanan-Hamilton ex D. Don) Handel-Mazzetti, Symb. Sin. 7: 837. 1936.

抱茎石龙尾 bao jing shi long wei

Cybbanthera connata Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 87. 1825; *Linnophila connata* (Buchanan-Hamilton) Pennell; *L. hypericifolia* (Benth.) Benth.; *Stemodia hypericifolia* Benth.

Herbs, terrestrial, 30–50 cm tall. Stems erect or ascending, simple or sparsely branched, glabrous, apically short glandular hairy. Leaves opposite or

sometimes 3–5 in a whorl on sprouts near rhizomes, sessile; leaf blade linear, ovate-lanceolate, or lanceolate, 2–4 × 0.3–2 cm, base subamplexicaul, margin entire or rarely obscurely toothed; veins 3–7, parallel. Spikes terminal, lax; bracts glandular puberulent. Flowers sessile or subsessile. Bracteoles 2, linear, ca. 5 mm, glandular puberulent, base adherent to calyx tube. Calyx cylindrical, ca. 7 mm, glandular puberulent, without raised veins in fruit. Corolla blue to purple, 1.1–1.5 cm, outside sparsely pubescent, inside villous. Capsule subglobose, ca. 3.5 × 3 mm, veins 2 and bulging. Fl. and fr. Sep–Nov.

Along streams, grassland, wet places; below 1400 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Yunnan [India, Laos, Myanmar, Nepal, Thailand, Vietnam].

6. *Linnophila rugosa* (Roth) Merrill, Interpr. Herb. Amboin. 466. 1917.

大叶石龙尾 da ye shi long wei

Herpestis rugosa Roth, Nov. Pl. Sp. 290. 1821.

Perennials, 10–50 cm tall. Rhizomes transverse. Stems 1 to few, ± fascicled, erect or ascending, usually unbranched, glabrous. Leaves opposite; petiole 1–2 cm, narrowly winged; leaf blade ovate, rhomboid-elliptic, or elliptic, 3–9 × 1–5 cm, abaxially hispidulous along veins, adaxially glabrous or sparsely hispidulous, margin crenate; veins pinnate, ca. 10 on each side of midrib, abaxially raised. Peduncle 0.2–3 cm; bracts subspatulate-oblong, with flattened membranous glands, margin entire or apically undulate-toothed and ciliate. Flowers axillary, solitary, sessile, usually appearing capitate. Bracteoles absent. Calyx 6–8 mm, without raised veins in fruit or with 5 raised veins and flattened membranous glands, margin ciliate. Corolla purple-red to blue, to 1.6 cm. Style slender, apically cylindrical, pubescent, with a membranous auricle on both sides. Capsule pale brown, ovoid, ca. 5 mm. Fl. and fr. Aug–Nov.

Adjacent to water, mountain valleys, grassland; below 900 m. Anhui, Fujian, Guangdong, Guangxi, Hunan, Taiwan, Yunnan [Bhutan, India, Indonesia, Japan (Ryukyu Islands), Laos, Malaysia, Myanmar, Nepal, Philippines, Sikkim, Thailand, Vietnam; Pacific Islands].

Used medicinally.

7. *Linnophila aromatica* (Lamarck) Merrill, Interpr. Herb. Amboin. 466. 1917.

紫苏草 zi su cao

Ambulia aromatica Lamarck, Encycl. 1: 128. 1783; *Linnophila aromaticoides* Yang & Yen; *L. chinensis* subsp. *aromatica* (Lamarck) T. Yamazaki; *L. gratissima* Blume; *L. punctata* Blume; *L. punctata* var. *subracemosa* Benth.

Annuals or perennials. Stems 30–70 cm, simple to much branched, glabrous or glandular, base decumbent

and rooting from nodes. Leaves opposite or in whorls of 3, sessile, ovate-lanceolate to lanceolate-elliptic, 1–5 × 0.3–1.5 cm, base semiamplexicaul, margin crenate and serrate; veins pinnate. Flowers solitary in leaf axils or in terminal or axillary racemes. Pedicel 0.5–2 cm, glabrous or glandular. Bracteoles linear to linear-lanceolate, 1.5–2 mm. Calyx 4–6 mm, glabrous or glandular pubescent, with raised veins in fruit. Corolla white, blue-purple, or pink, 1–1.3 cm, sparsely and finely glandular, inside white villous. Style apex dilated; stigma short, 2-lamellate. Capsule ovoid, ca. 6 mm. Fl. and fr. Mar–Sep.

Around reservoirs and other moist places; low elevations. Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Taiwan [Bhutan, India (Darjeeling), Indonesia (Java), Japan, Korea, Laos, Philippines, Vietnam; Australia].

The characters used by Yang & Yen (Bot. Bull. Acad. Sinica 38: 285–295. 1997) to distinguish *Limmophila aromaticoides* from *L. aromatica* clearly fall within the variation range of the latter.

8. *Limmophila chinensis* (Osbeck) Merrill, Amer. J. Bot. 3: 581. 1916.

中华石龙尾 zhong hua shi long wei

Columnnea chinensis Osbeck, Dagb. Ostind. Resa 230. 1757; *Limmophila chevalieri* Bonati; *L. hirsuta* (Heyne ex Benth.) Benth.; *Stemodia hirsuta* Heyne ex Benth.

Herbs, 5–50 cm tall. Stems basally prostrate, rooting from nodes, simple or basally branched, villous to subglabrous. Leaves opposite or in whorls of 3 or 4, sessile, ovate-lanceolate, linear-lanceolate, or rarely spatulate, 0.5–5.3 × 0.2–1.5 cm, abaxially villous along veins, adaxially glabrous or sparsely villous, base subamplexicaul, margin serrate; veins pinnate, inconspicuous. Flowers solitary in leaf axils, or in terminal panicles. Pedicel 3–5 mm, villous to subglabrous. Bracteoles ca. 2 mm. Calyx 5–7 mm, villous to subglabrous, with raised veins in fruit. Corolla purple-red, blue, or rarely white, 1–1.5 cm. Capsule compressed, broadly ellipsoid, ca. 5 mm. Fl. and fr. Oct–May.

Edge of water, wet fields; below 1800 m. Guangdong, Guangxi, Hainan, Yunnan [Cambodia, India (Darjeeling), Indonesia, Laos, W Malaysia, Sikkim, Thailand, Vietnam; Australia].

9. *Limmophila repens* (Benth.) Benth. in A. de Candolle, Prodr. 10: 387. 1846.

匍匐石龙尾 pu fu shi long wei

Stemodia repens Benth. in Lindley, Bot. Reg. 17: ad t. 1470. sp. 11. 1832.

Herbs, to 45 cm tall; stems, pedicels, bracts, and bracteoles hispidulous or rarely glabrous. Stems erect, basally prostrate or repent, simple or branched. Leaves opposite, sessile, narrowly elliptic, linear-lanceolate, or

lanceolate-elliptic, 0.5–3 cm × 3–10 mm, adaxially hispidulous or subglabrous, base subamplexicaul, margin serrate; veins pinnate. Flowers solitary and axillary, or in axillary racemes. Pedicel 0.5–3 mm, hispidulous. Bracteoles 2–3 mm. Calyx 4–6 mm, hispidulous to subglabrous, with raised veins in fruit; lobes 1.5–3 mm, narrowly lanceolate, margin ciliate, apex acuminate. Corolla white, purple-red, or blue, 5–10 mm, outside glabrous, inside white villous. Capsule ovoid, 3–4 mm. Fl. and fr. Nov–May.

Moist places near water; low elevations. Guangxi, Hainan [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Australia].

10. *Limmophila erecta* Benth. in A. de Candolle, Prodr. 10: 388. 1846.

直立石龙尾 zhi li shi long wei

Annuals, 15–25 cm tall. Stems erect or ascending, simple or much branched, glabrous or hispidulous. Leaves opposite, sessile or base narrowed and appearing stalked; leaf blade linear-elliptic, 0.5–3 cm × 3–8 mm, glabrous, margin crenate and toothed, veins pinnate. Flowers solitary and axillary or in axillary or terminal racemes. Pedicel 2–4 mm, glabrous or hispidulous, recurved in fruit. Bracteoles linear, 0.5–0.8 mm. Calyx 4–5 mm, glabrous, with raised veins in fruit. Corolla white or pink, 6–7 mm, outside glabrous. Capsule ovoid, ca. 3.5 mm. Fl. and fr. Jul–Oct.

Wet grassland, near water; below 1500 m. Guangdong, Yunnan [Indonesia, Malaysia, Myanmar, Thailand, Vietnam].

