

7. VALLISNERIA Linnaeus, Sp. Pl. 2: 1015. 1753.

苦草属 ku cao shu

Physkium Loureiro.

Herbs, submerged, stoloniferous, without erect stems. Leaves basal, sessile, linear or strap-shaped, veins 3–9, parallel, slightly sheathed at base, margin minutely serrulate or entire. Plants dioecious; flowers unisexual. Male flowers numerous, minute, shortly pedicellate, clustered together on a central column enclosed by a common spathe, each flower finally breaking free and floating on water surface; spathe ovate or broadly lanceolate, shortly pedunculate; sepals 3, convex, 2 larger than other; petals 2 or 3, minute; stamens 1–3. Female flowers solitary in spathe; spathe tubular, bifid at apex, pedunculate; peduncles long, coiled after anthesis; sepals 3; petals 3, minute; ovary narrowly cylindrical or narrowly triangular-cylindrical; ovules numerous; styles 3, bifid. Fruit cylindrical or triangular-cylindrical. Seeds numerous, oblong or fusiform.

About eight species: tropical and subtropical regions; three species (one endemic) in China.

- 1a. Stamen 1; fruit cylindrical; veins without spines 1. *V. natans*
1b. Stamens 2; fruit triangular-cylindrical; midveins with minute spines.
2a. Seeds 2–5-winged 2. *V. spinulosa*
2b. Seeds without wings 3. *V. denseserrulata*

1. *Vallisneria natans* (Loureiro) H. Hara, J. Jap. Bot. 49: 136. 1974.

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Physkium natans Loureiro, Fl. Cochinch. 2: 663. 1790; *Vallisneria asiatica* Miki; *V. asiatica* var. *higoensis* Miki; *V. gigantea* Graebner; *V. gigantea* var. *higoensis* (Miki) Kitamura; *V. higoensis* (Miki) Ohwi; *V. natans* var. *higoensis* (Miki) H. Hara; *V. physcium* Jussieu ex Sprengel, nom. illeg. superfl.; *V. spiraloidea* Roxburgh.

Rhizome tuberous; stolons ca. 2 mm in diam., usually smooth. Leaves 0.2–2 m × 0.5–2 cm, veins 5–9, margin entire or inconspicuously serrulate, apex obtuse. Male spathe ovate-conic, 1.5–2 cm × 5–10 mm, with more than 200 male flowers; sepals strongly convex; stamens 1, filaments sometimes 2-lobed at apex, with hairs at base. Female spathe 1.5–2 cm; peduncle 30–50 cm or longer, slender; sepals greenish purple, 2–4 × ca. 3 mm, apex obtuse; petals white, minute; staminodes 3. Fruit cylindrical, 5–30 cm × ca. 5 mm. Seeds narrowly obovoid, glandular hairy. $2n = 20$.

Rivers, streams, ponds, lakes. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan (including Ryukyu Islands), Korea, Malaysia, Nepal, Russia (Far East), Vietnam; SW Asia, Australia].

2. *Vallisneria spinulosa* S. Z. Yan, J. Sci. Med. Jinan Univ. 2: 161. 1982.

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Rhizome tuberous; stolons with minute spines. Leaves 20–50(–200) cm × 4–10 mm, midvein prominent, with 1 row of minute spines, margin serrulate, apex obtuse or slightly acute. Male spathe conic, 1–1.5 cm × 5–8 mm, with more than 300 male flowers; sepals convex; petals 2, connected at base of filaments; stamens 2, filaments without hairs. Female spathe 1–2 cm, with very long slender peduncle; sepals ca. 4 × 2 mm, apex

obtuse; petals minute; staminodes 3. Fruit triangular-cylindrical, 8–20 cm × 4–7 mm, with spines on angles. Seeds obovoid, 2–5-winged. Fl. and fr. Aug–Oct. $2n = 20^*$.

• Ponds, lakes. Guangxi, Hubei, Hunan, Jiangsu.

3. *Vallisneria denseserrulata* (Makino) Makino, J. Jap. Bot. 2: 19. 1921.

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Vallisneria spiralis Linnaeus var. *denseserrulata* Makino, Bot. Mag. (Tokyo) 28: 27. 1914.

Rhizome erect, 1–6 cm, 4–6 mm in diam.; stolons with minute spines. Leaves 20–70 cm × 6–12 mm, veins 3, midvein with minute spines, margin densely serrulate, apex obtuse or acute. Male spathe triangular, 1–1.5 cm × ca. 6 mm, many flowered; sepals reflexed; stamens 2. Female spathe 1.5–2 cm, with slender and very long peduncle; sepals ca. 3 × 2 mm, apex acute. Fruit triangular-cylindrical. Seeds not winged. Fl. and fr. Sep–Oct. $2n = 20$.

Streams, lakes. Anhui, Guangdong, Guangxi, Hubei, Liaoning, Zhejiang [Japan].

Fl. China 23: 99–100. 2010.