

HIPPURIDACEAE

杉叶藻科 shan ye zao ke

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Herbs aquatic, perennial, glabrous, with creeping rhizomes. Stems submerged or emergent, erect, simple, leafy. Leaves estipulate, whorled, sessile, simple, linear to ovate, margin entire. Flowers solitary in axils of upper leaves, sessile, minute, bisexual or unisexual, Perianth reduced to an entire rim on top of ovary. Stamen 1, epigynous. Ovary inferior, 1-loculed; ovule 1, pendulous, anatropous, micropyle closed; style filiform, with stigmatic papillae down one side. Fruit a small achene.

One genus and two species: temperate regions worldwide, mainly in the N hemisphere; two species in China.

Hippuris and *Callitriche* Linnaeus (to be treated in Callitricaceae in Fl. China 11) are sister genera and, together with several genera already treated in the Scrophulariaceae (see Fl. China 18. 1998), are now regarded as belonging with *Plantago* Linnaeus in an expanded Plantaginaceae; see Olmstead et al. (Amer. J. Bot. 88: 348–361. 2001), who incorrectly used the name Veronicaceae for this group instead of Plantaginaceae.

Wan Wenhao. 2000. Hippuridaceae. In: Chen Chiaju, ed., Fl. Reipubl. Popularis Sin. 53(2): 144–147.

1. HIPPURIS Linnaeus, Sp. Pl. 1: 4. 1753.

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Morphological characters and geographic distribution are the same as those of the family.

- 1a. Leaves (4–)8–12-whorled, lanceolate to linear, 1.5–6 × 0.1–0.2 cm, submerged leaves longer than emergent leaves 1. *H. vulgaris*
1b. Leaves (2–)4(–6)-whorled, ovate, elliptic, or lanceolate, 0.4–1.2 × 0.5–0.7 cm, submerged leaves shorter than emergent leaves 2. *H. tetraphylla*

1. *Hippuris vulgaris* Linnaeus, Sp. Pl. 1: 4. 1753.

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Hippuris eschscholtzii Lamarck; *H. montana* Reichenbach; *H. spiralis* D. Yu; *H. vulgaris* var. *ramificans* D. Yu.

Stems 10–150 cm or longer in running water. Leaves (4–)8–12-whorled, often spreading, lanceolate to linear, 1.5–6 × 0.1–0.2 cm, longest at mid-shoot, margin entire to weakly denticulate, apex somewhat thickened, subacute; submerged leaves longer than emergent leaves. Flowers purplish. Stamens ca. 1.5 mm. Ovary ca. 1 mm. Achene ovoid-ellipsoid, 1.5–2.5 mm, smooth. Fl. Apr–Sep, fr. May–Oct.

Stagnant and slow-running waters, lakes, bogs, streams, river shores, paddy fields; near sea level to 5000 m. Gansu, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan [temperate regions worldwide].

The character of leaves spirally arranged seems not to be true for *Hippuris spiralis*. In fact, in that entity the leaves are whorled but the

whorls are oblique. This variation may be caused by twisted shoots, especially in running water. Terminal subshoots are a common variant in *H. vulgaris*. For these reasons, both *H. spiralis* and *H. vulgaris* var. *ramificans* are treated here as synonyms of *H. vulgaris*.

2. *Hippuris tetraphylla* Linnaeus f., Suppl. Pl. 81. 1782.

四叶杉叶藻 si ye shan ye zao

Stems 10–50 cm. Leaves (2–)4(–6)-whorled, ovate, elliptic, or lanceolate, 0.4–1.2 × 0.5–0.7 cm, fleshy, margin entire, apex subacute; submerged leaves shorter than emergent leaves. Flowers purplish. Stamens ca. 1 mm. Achene ovoid. Fl. and fr. Aug.

Bogs, salt marshes. NE Nei Mongol (Mangui) [Japan; Europe, North America].

This species is very similar to *Hippuris vulgaris* but is traditionally separated by its shorter, 4-whorled leaves. These characters are to some extent under environmental control, being present at low temperatures or high salinity. *Hippuris tetraphylla* is commonly recognized in Europe and North America but less so in Asia.

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