

**CERATOPHYLLACEAE**

金鱼藻科 jin yu zao ke

Fu Dezhi (傅德志)<sup>1</sup>; Donald H. Les<sup>2</sup>

Herbs perennial, submersed, hydrophilous, monoecious. Roots absent. Stems glabrous, branched, free or attached by slender shoots. Stipules absent. Leaves cauline, 3–11 in a whorl; petiole inconspicuous; leaf blade divided dichotomously into filiform segments; segments with 2 rows of denticles. Inflorescences reduced, solitary or with vestigial branches, 1-several at a node, extra-axillary, alternating with leaves, sessile or peduncles lengthening in fruit; involucre of 8–15 foliaceous bracts; bracts 1.5–2 mm, apex terminated by 2 denticles and a medial multicellular appendage. Flowers naked, subsessile. Staminate flower: stamens 3–50, spiral; filaments short; anthers 2-celled, dehiscing by longitudinal slits. Pistillate flower: pistil 1, simple; ovary 1-loculed, placentation laminar; ovule 1, pendulous; style persistent, short or elongate; stigma decurrent. Achene leathery, indehiscent, ellipsoid, smooth or tuberculate, basal spines 0–2, facial spines 0–2, marginal wing present or absent, marginal spines 1–8. Seed 1, unitegmic, endosperm and perisperm absent; cotyledons fleshy.

One genus and six species: cosmopolitan; three species in China.

Kuan Ke-chien. 1979. Ceratophyllaceae. Fl. Reipubl. Popularis Sin. 27: 15–19.

**1. CERATOPHYLLUM** Linnaeus, Sp. Pl. 2: 992. 1753.

金鱼藻属 jin yu zao shu

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

*Ceratophyllum* foliage has been used as a treatment for biliousness, jaundice, scorpion stings, and minor irritations. Liniments made from leaves of *C. demersum* have been used to treat dermatitis, elephantiasis, fever, and sunburn.

- 1a. Leaves 3 or 4 × dichotomously divided ..... 3. *C. muricatum*  
 1b. Leaves 1 or 2 × dichotomously divided.  
     2a. Achene facial surfaces spineless ..... 1. *C. demersum*  
     2b. Achene facial surfaces each with a spine ..... 2. *C. platyacanthum*

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**1. *Ceratophyllum demersum*** Linnaeus, Sp. Pl. 2: 992. 1753.  
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Stems to 3 m. Leaves bright green, coarse textured, 1–2 × dichotomously divided; whorls 1.5–6 cm in diam.; segments linear to filiform, 1.5–2 cm × 1–5 μm, not inflated. Flowers 1–3 mm in diam. Achene dark green to reddish brown, body (excluding spines) 3.5–6 × 2–4 mm, smooth or slightly tuberculate, margins wingless and spineless, facial spines absent; basal spines or tubercles 2, 0.1–12 mm, straight or curved; terminal spine (persistent style) 0.5–14 mm. Fl. and fr. Jun–Sep.  $2n = 24, 38, 40, 48$ .

Streams, ponds, lakes. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jilin, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Cosmopolitan].

This species is widespread throughout China and expected to be reported from additional provinces.

**2. *Ceratophyllum platyacanthum*** Chamisso subsp. ***oryztorum*** (V. Komarov) Les, Syst. Bot. 13: 517. 1988.

五刺金鱼藻 wu ci jin yu zao

*Ceratophyllum oryztorum* V. Komarov, Izv. Bot. Sada Akad. Nauk. S.S.S.R. 30: 200. 1932; *C. demersum* Linnaeus var. *pentacorne* Kitagawa; *C. demersum* var. *quadrispinum* Makino; *C. pentacanthum* Hayata.

Stems to 1 m. Leaves deep green, 1–2 × dichotomously divided; whorls 2.5–4 cm in diam.; segments linear, 1–2 cm × 3–5 μm, not inflated. Flowers unknown. Achene brown or dark green, 4–5 × 2–3 mm, smooth or slightly

tuberculate, margins wingless and spineless, facial spines 2, 0.5–9.5 mm, not decurrent; basal spines 2, 1.5–12.5 mm, straight or curved; terminal spine (persistent style) 2–12.5 mm. Fl. and fr. Jun–Sep.

Ponds, streams. Anhui, Guangxi, Hebei, Heilongjiang, Hubei, Jilin, Liaoning, Nei Mongol, Ningxia, Shandong, Taiwan, Zhejiang [Japan, Korea, Russia (Far East)].

**3. *Ceratophyllum muricatum*** Chamisso subsp. ***kossinskyi*** (Kuzeneva-Prochorova) Les, Syst. Bot. 13: 85. 1988.

粗糙金鱼藻 cu cao jin yu zao

*Ceratophyllum kossinskyi* Kuzeneva-Prochorova, Fl. URSS 7: 721. 1937; *C. inflatum* C. C. Jao ex K. C.

Kuan; *C. manschuricum* (Miki) Kitagawa; *C. submersum* Linnaeus var. *manschuricum* Miki; *C. submersum* var. *squamosum* Wilmot-Dear.

Stems to 1 m. Leaves yellowish green, 2–4 × dichotomously divided, whorls 2.5–6 cm in diam.; segments linear to filiform, 1–1.2 cm × 0.2–2 mm, bases occasionally inflated. Flowers unknown. Achene brown or dark green, 3.5–4 × 2–2.5 mm, surfaces tuberculate to papillate, with plate-like ridges that occasionally become spiny, margins winged or wingless, entire or with 1–8 slender spines, 0.1–2.5 mm; basal spines 2, 1.5–6 mm; terminal spine (persistent style) 1–1.5 cm. Fl. and fr. Jul–Oct.

Lakes, ponds, streams. Fujian, Hebei, Heilongjiang, S Hubei (Shashi Shi), Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Taiwan, Yunnan [Kazakhstan, Russia (Siberia); E Europe].

