



Annual, free-floating rootless heterosporous fern, overwinters only in the form of spores in sporocarps forming under senescing leaves. Shoots 3–5 cm long bear whorls of three leaves: a pair of floating leaves 12–20 mm long and a submerged, thin and filamentous leaf 3–6 cm long with numerous hairs reminding a root (rhizophyll), floating leaves densely covered by 1–1.5 mm long hairs repelling water. Three-mm large sporocarps contain either small dark brown microspores or larger whitish macrospores, membranous prothallium ca. 2 mm large, terrestrial form known.

### Distribution and ecology

Euro-Siberian and South Asian distribution. Scattered in all 7 CE countries, mainly in lowlands. Standing waters in fishponds, lakes, dam reservoirs, backwater pools, oxbows, fen lakes, and canals, at water depth of 0.05–2 m. Tolerates slightly acidic to alkaline, hard water (pH 6.5–8, total alkalinity 1.5–4 meq/l), clear or slightly dystrophic waters with organic or clayish bottom, prefers mesotrophic to slightly eutrophic waters on neutral or alkaline base-rich soils, thermo- and photophilous.

### Anatomy of the stem

The stem has a diameter of 1 mm (1). Secondary growth is absent.

The stem is composed of a closed concentric reniform vascular bundle, a large aerenchymatic cortex and an epidermis (1). The xylem consists of an arc of lignified vessels, which are separated by a few parenchyma cells. The phloem is composed of sieve tubes and small companion cells. The central cylinder and the cortex are separated by a lignified endodermis (2). Large intercellulars are separated laterally by radial strips of parenchyma cells (1). The stem is externally surrounded by an epidermis and a hypodermis (1).

