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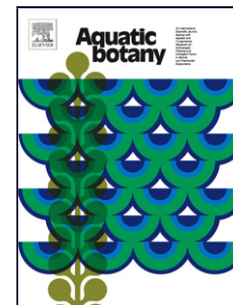
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## Seed germination ecology in *Trapa natans* L., a widely distributed freshwater macrophyte

Running title: Seed germination of *Trapa natans*

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### Highlights

- Mature seeds were dormant and required 9 weeks cold stratification for dormancy-break.
- Seeds showed freeze-tolerance, while young germinants exhibited freeze-sensitivity.
- Non-dormant seeds germinated well over a wide range of environmental conditions.
- Seeds were highly desiccation-sensitive, even at high RH.

### Abstract

*Trapa natans* is an aquatic annual plant that grows in stagnant water and occupies an extremely wide, yet discontinuous native range across temperate Europe, Asia, and Africa, and is naturalized in North America and Australia. Despite its wide distribution and invasion success, its seed germination ecology is poorly known. We hypothesized that, due to its wide distribution range, *T. natans* seeds should germinate under a broad spectrum of environmental conditions. In

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