
Allelopathy of aquatic plants – Quoi de neuf ?

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Abstract

Plants growing in the water column, so called submerged macrophytes, face multiple challenges, among them often light and carbon limitation, while nutrient uptake can be from sediment and/or water. This results in recurrent competition with other primary producers such as phytoplankton, periphyton or epiphytic algae. Also emergent or floating-leaved macrophytes may face competition with other higher plants or algae. The content and release of allelopathically active compounds can provide an advantage to producing plants, and may help to keep competitors within limits. Studies on allelopathy between submerged macrophytes and other primary producers focus mainly on extracts or leaching of plant material, or on water where the plants have been cultured in. So far, only few active compounds have been isolated from extracts, and we know even less about active compounds released to the water or sediment. This presentation will provide a short overview of studies published on the allelopathy of aquatic macrophytes, mainly focussing on the past 15 years, with a focus on which species and compounds have been identified as allelopathically active, which target organisms and test systems have been used, and which modes of action of the allelopathically active compounds were isolated. Open questions are how environmental conditions influence the production and release of active compounds, whether allelopathic interactions can be induced (or inhibited) depending on the prevalent interactions and environmental conditions, whether allelopathically active compounds have also other bioactive functions for the producing plant, or if exotic invasive species have a higher allelopathic potential than native plants. Indirect evidence for allelopathic interactions from mesocosm and field studies will be considered, with a quest to develop environmentally realistic studies taking into account natural settings.

Keywords: freshwater, submerged macrophytes, aquatic plants, phytoplankton, periphyton, epiphytes

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