Hydrobiologia (2021) 848:2119–2151
https://doi.org/10.1007/s10750-020-04463-z

INVASIVE SPECIES III

Review Paper

From introduction to nuisance growth: a review of traits of alien aquatic plants which contribute to their invasiveness

Andreas Hussner · Patrick Heidbüchel · Julie Coetzee · Elisabeth M. Gross

Received: 15 May 2020 / Revised: 17 September 2020 / Accepted: 11 November 2020 / Published online: 8 February 2021

Abstract Invasive alien aquatic plant species (IAAPs) cause serious ecological and economic impact and are a major driver of changes in aquatic plant communities. Their invasive success is influenced by both abiotic and biotic factors. Here, we summarize the existing knowledge on the biology of 21 IAAPs (four free-floating species, eight sediment-rooted, emerged or floating-leaved species, and nine sediment-rooted, submerged species) to highlight traits that are linked to their invasive success. We focus on those traits which were documented as closely linked to plant invasions, including dispersal and growth patterns, allelopathy and herbivore defence. The traits are generally specific to the different growth forms of IAAPs. In general, the species show effective dispersal and spread mechanisms, even though sexual and vegetative spread differs strongly between species. Moreover, IAAPs show varying strategies to cope with the environment. The presented overview of traits of IAAPs will help to identify potential invasive alien aquatic plants. Further, the information provided is of interest for developing species-specific management strategies and effective prevention measures.

Keywords Dispersal · Weed biology · Invasive aquatic plant species · Invasive plant traits

Guest editors: Katya E. Kovalenko, Fernando M. Pelicice, Lee B. Kats, Jonne Kotta & Sidinei M. Thomaz / Aquatic Invasive Species III

A. Hussner (✉)
Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Müggelseedamm 301, 12587 Berlin, Germany
e-mail: Hussner@igb-berlin.de

P. Heidbüchel
Photosynthesis and Stress Physiology of Plants, Henrich-Heine-University, Universitätsstr. 1, 40225 Düsseldorf, Germany

J. Coetzee
Centre for Biological Control Botany Department, Rhodes University, P.O. Box 94, Grahamstown 6140, South Africa

E. M. Gross
Université de Lorraine, CNRS, LIEC, 57000 Metz, France

Introduction

Invasive alien aquatic plants (IAAPs) are considered a serious threat to aquatic ecosystems throughout the world. Due to their nuisance growth, IAAPs have both significant economic and ecological impact (Holm et al., 1969, Halstead et al., 2003, Stiers et al., 2011a; Santos et al., 2011). Consequently, management options are ongoing to reduce the impact of IAAPs, which are highly cost-intensive and resource demanding (Hussner et al., 2017; Simberloff, in press).