Mar Biol (2015) 162:2447–2448
DOI 10.1007/s00227-015-2729-2

INVASIVE SPECIES - EDITORIAL COMMENT

Preface to "Invasive Species" Topical Collection

Elizabeta Briski[1] · **Farrah Chan**[2]

Received: 31 July 2015 / Accepted: 24 August 2015 / Published online: 11 September 2015

Marine Biology introduces a new feature called 'Topical Collections', which promotes current and emergent areas of research. The electronic 'Topical Collections' are continuations of the former printed 'Special Issues', with an advantage of being publicly available with the very first article accepted. In addition to the online publication in the 'Topical Collection', all articles are published electronically and in print in regular volumes.

The first Marine Biology 'Topical Collection' focuses on "Invasive Species". Human population growth and increased global trade have significantly expanded our collective ecological 'footprint', with the introduction of non-indigenous species, particularly the invasive ones, being recognized as one of the dominant environmental stressors (Sala et al. 2000). Invasive species may act as predators, parasites, pathogens, or competitors of native species; their introductions and spread can result in dramatic changes in recipient ecosystems, including significant negative impact on local biodiversity as well as ecosystem functions and services to human society (Simberloff et al. 2013). The ability to predict and/or identify future invaders, the responsible transport vectors and pathways (i.e., transport means and routes), and potential impact would allow managers and policy makers to develop strategies to prevent new invasions and manage existing ones, while also making valuable contributions to basic ecology and conservation biology. Invasion ecology is a rather young field, and much effort is still needed to develop generalized principles and to transform the discipline into a predictive science.

The majority of studies on invasive species have focused on terrestrial habitats. However, marine and coastal systems worldwide are being invaded at extraordinary rates owing to shipping, opening and construction of seaways and canals, fisheries, aquarium trade, habitat modification, and climate change (Williams et al. 2013). In particular, shipping vectors such as ballast water and hull fouling, which are responsible for 65–70 % of aquatic invasions (Ricciardi 2006; Molnar et al. 2008), are capable of translocating almost entire aquatic communities during a single introduction event (Sylvester et al. 2011; Briski et al. 2012) and have no equivalent in the terrestrial environment. Therefore, work addressing key transport vectors in aquatic systems such as those that quantify the number of transported species and their abundances (i.e., propagule and colonization pressures), those that examine community dynamics of entrained assemblages during the transport process, and those that investigate genetic diversity and phenotypic plasticity of introduced species in relation to vector type is urgently needed. Further, studies identifying predictors of invasion success, forecasting impact of invasive species on invaded communities, and testing of hypotheses, such as the importance of hybridization, invasion meltdown, and enemy release, are essential for understanding mechanisms underlying invasion success in marine and coastal environments as well as abilities of invasive species to adapt rapidly during the invasion process. This 'Topical Collection' addresses many tenets of invasion ecology and sheds new light on this important part of marine biology. It provides a venue for the exchange of information on various aspects about aquatic invasion ecology and an opportunity

This article is part of the Topical Collection on Invasive Species.

✉ Elizabeta Briski
ebriski@geomar.de

[1] GEOMAR, Helmholtz Centre for Ocean Research Kiel, Düsternbrooker Weg 20, 24105 Kiel, Germany

[2] Great Lakes Laboratory for Fisheries and Aquatic Sciences, Fisheries and Oceans Canada, Burlington, ON L7S 1A1, Canada

for dialog between academia, industry, and environmental regulators.

References

Briski E, Bailey SA, Casas-Monroy O, DiBacco C, Kaczmarska I, Levings C, MacGillivary ML, Mckindsey CW, Nasmith LE, Parenteau M, Piercey GE, Rochon A, Roy S, Simard N, Villac C, Weise AM, MacIsaac HJ (2012) Relationship between propagule pressure and colonization pressure in invasion ecology: a test with ships' ballast. P R Soc B Biol Sci 279:2990–2997

Molnar JL, Gamboa RL, Revenga C, Spalding MD (2008) Assessing the global threat of invasive species to marine biodiversity. Front Ecol Env 6:485–492

Ricciardi A (2006) Patterns of invasion of the Laurentian Great Lakes in relation to changes in vector activity. Divers Distrib 12:425–433

Sala OE, Chapin SF, Armesto JJ, Berlow E, Bloomfield J, Dirzo R, Huber-Sanwald E, Huenneke LF, Jackson RB, Kinzig A, Leemans R, Lodge DM, Mooney HA, Oesterheld M, Poff NL, Sykes MT, Walker BH, Walker M, Wall DH (2000) Global biodiversity scenarios for the year 2100. Science 287:1770–1774

Simberloff D, Martin J, Genovesi P, Maris V, Wardle DA, Aronson J, Courchamp F, Galil B, García-Berthou E, Pascal M, Pyšek P, Sousa R, Tabacchi E, Vilà M (2013) Impacts of biological invasions: what's what and the way forward. Trends Ecol Evol 28:58–66

Sylvester F, Kalaci O, Leung B, Lacoursière-Roussel A, Clarke Murray C, Choi FM, Bravo MA, Therriault TW, MacIsaac HJ (2011) Hull fouling as an invasion vector: can simple models explain a complex problem? J Appl Ecol 45:415–423

Williams SL, Davidson IC, Pasari JR, Ashton GV, Carlton JT, Crafton RE, Fontana RE, Grosholz ED, Miller AW, Ruiz GM, Zabin CJ (2013) Managing multiple vectors for marine invasions in an increasingly connected world. BioScience 63:952–966