Can benthic filter-feeding bivalves clean the Indian River Lagoon (Florida, USA)?

Dr. Eva Galimany
Smithsonian Marine Station, Florida, Estats Units d'Amèrica

Dilluns, 26 d'octubre de 2015

Summary

The Indian River Lagoon (IRL), located in the Atlantic coast of Florida (USA), is one of the most diverse estuaries in the USA gathering both temperate and subtropical species. The enormous biodiversity that the Lagoon contains has been recently threatened by a massive bloom of phytoplankton which occurred in the late fall of 2011. The superbloom lasted 7 months and the estimate sea grass loss was more than 45% (about 128 km²). As a consequence of the sea grass coverage reduction, not only the fauna and flora suffered very negative effects but also the local economy dependent upon the estuary, particularly its fisheries. The scientific community worried after this unique and catastrophic event and developed a plan of investigation to understand better the Lagoon, the formation of the superbloom, and how to deal with it in case of repetition. One important question to approach was to identify the benthic filter-feeding species from the Lagoon and evaluate their capacity to mitigate possible future blooms. Therefore, the feeding behavior of different benthic bivalves has been studied in situ and under laboratory conditions since the beginning of the project, early 2015: i) The feeding behavior of oysters *Crassostrea virginica* and quahogs *Mercenaria mercenaria* were studied in situ in three different locations in the North IRL; ii) The potential feeding competition between the invasive mussel *Mytella charruana* and the local oysters *Crassostrea virginica*, were studied in an situ experiment in the Canaveral National Seashore Park; iii) The study of the clearance of different filter feeding invertebrates on the 4 microalgal species that bloomed in 2011-2012 in the NIRL, i.e. *Aureoumbra lagunensis*, *Synechococcus* sp., an unidentified Pedinophyte, and an unidentified picocyanobacterium. The results will allow us to understand the role of the different species in the lagoon and how important they are for the ecosystem.

Brief biography

I obtained my Doctorate in Biology with European mention from the University of Barcelona, within the Aquaculture program, in 2010. My dissertation was entitled “Feeding behavior of the mussel *Mytilus* spp.: responses to the natural variability of seston and to toxic phytoplankton ingestion”. A few months later I was awarded with a
National Research Council Postdoctoral Fellowship at the NOAA Milford Laboratory (CT) to study the physiology and biology of cultivated ribbed mussels (Geukensia demissa) and the potential use of their filtration activity for nitrogen removal purposes. Later, in 2013, I got involved with the project LLONGO, studying the biology and feeding physiology of the eatable Mediterranean sea cucumber *Stichopus regalis* with the Spanish Institute of Oceanography. In 2015 I joined the Smithsonian Institute in Fort Pierce (FL) as a third post-doctoral experience to lead the filter-feeding experiments to study the ability of benthic filter-feeders to deplete algal blooms in the North Indian River Lagoon.

![Map of the USA with the Indian River Lagoon highlighted.](image)

*Fig. East coast of the USA and detail where the IRL is located.*

**References**