The effect of protection and wave-exposure of two marine protected areas have opposite trends on macroalgae invasiveness.

Andreu Blanco Cartagena[1, 2,*], Jesús Souza Troncoso[1], Celia Olabarria[1], Marco Filipe Loureiro Lemos[3]

[1]Department of Animal Biology and Ecology, Universidad de Vigo, Vigo, Pontevedra, Spain

[2]Aquatic Ecology and Evolution, Centro Interdisciplinar de Investigaçao Marinha e Ambiental, Porto, Portugal

[3]Estuaries and Coastal zones, Instituto Politécnico de Leiria, Peniche, Portugal

*Corresponding author: Andreu Blanco, andreu.blanco@gmail.com

Negative impacts of marine invasions include loss of genetic diversity, ecosystem functions/processes, and/or community structure and, consequently, a threat to global biodiversity through biotic homogenization. Recent studies indicate that invasive macroalgae make up a significant proportion of marine invasive species. Marine Protected Areas (MPAs) have been proved to have positive effects on marine biodiversity conservation; however, their role in preventing biological invasions, especially macroalgae, is still poorly understood. In this context, we studied the effects of protection and wave exposure on the abundance of six invasive macroalgae (*Grateloupia turuturu*, *Asparagopsis armata*, *Colpomenia peregrina*, *Sargassum muticum*, *Undaria pinnatifida*, and *Codium fragile* ssp. *fragile*) at two MPAs of the western Iberian Peninsula, one located along the Spanish coast (Illas Atlánticas) and the other on the Portuguese coast (Berlangas). The results showed opposite effects of protection and wave-exposure at the two MPAs. Greater biomass of invasive macroalgae was found at semiexposed areas outside the reserve in the Spanish MPA, whereas in the Portuguese reserve, biomass (especially of *A. armata*) was significantly greater inside the reserve, mainly at semiexposed sites. These differences highlight the importance of understanding the functioning of reserves to apply proper conservation management policies in order to preserve the MPAs resilience.