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Do Medusae impact Human Welfare?

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Medusae aggregations (blooms) are a natural feature of healthy marine ecosystems, but evidence has accumulated that in large part of European coastal waters including Mediterranean the incidence of jellyfish blooms has increased recently. More severe and frequent blooms are thought to be at least partly due to anthropogenic causes such as eutrophication, habitat modifications, overfishing, species translocations, and climate change.

In this contribution we review the impacts of medusae on human welfare, including both, either positive or negative. The public perception of medusae is prevailingly negative associated with their threat to human health due to stinging. Medusae blooms may thus have a detrimental effect on the tourist industry. Moreover, blooms may impede fishing and cause losses to aquaculture, and generate problems to desalinisation plants and coastal industry due to clogging of cooling water intakes. On the other hand medusae provide food and shelter for several marine organisms, especially in Far East they are considered as delicacy and healthy food. Medusae provide some important compounds for biomedical applications and finally, medusa are becoming progressively popular in aquaria exhibits generating tourist revenues.

Among Mediterranean sub-regions that have experienced several jellyfish blooms in last decades is the northern Adriatic Sea where nuisance (blooming) species include five scyphozoan medusae, among which, the moon jellyfish and barrel jellyfish have been most abundant. As a specific case we therefore focused on negative impacts of these two species on Slovenian fishing industry from 2008 to 2015. Firstly, available fisheries sector data are collected and analysed. An obvious downward trend in fish catch and a seasonal pattern can be observed. Secondly, we have used a questionnaire survey among Slovenian fishermen to assess how they perceive impacts of medusae blooms on their activity. Moreover, linear regression model has been constructed to determine the influence of blooms on the fish catch, focusing in particular on the most fished species. Based on a literature review and our own knowledge of Slovenian fishing industry a selection of controls for industry specific and general economic conditions was chosen. Monthly data on fish catch and medusae blooms are used, therefore monthly dummies are included in our model to account for seasonality. Finally, the results are calculated, presented and discussed. Due to data constraints, the results of linear regression analysis do not offer proper conclusions, but nevertheless they are indicative. If interpreted together with survey results, they provide a good insight into the economic consequences of medusae blooms on Slovenian fishery. In future we plan to extend our analysis also on impacts on tourism industry.

Keywords: medusae, fishery, human welfare, economic impacts