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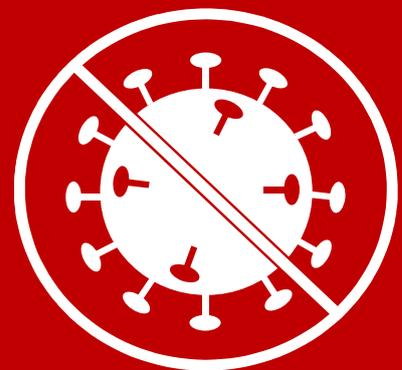


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Is Citizen Science a valid tool for monitoring alien species in Marine Protected Areas?

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Abstract

The introduction of non-indigenous species (NIS, i.e. organisms introduced outside of their natural, past or present, range and outside of their natural dispersal potential) has been pointed out as a major driver of global change, threatening biodiversity and natural ecosystem functioning. NIS may in time become invasive, i.e. invasive alien species (IAS) and may cause biodiversity loss and ecosystem service changes. The Mediterranean Sea, currently hosting approximately 1000 NIS, is considered a hotspot of marine biological invasions. Islands, many of which are Marine Protected Areas (MPAs), whose major aim is biodiversity conservation, are particularly prone to NIS invasions. To reduce the risk of future IAS introduction in MPAs and to better understand their invasive potential and spread dynamics, monitoring programs are crucial. In this respect, Citizen Science, actively involving volunteers (e.g. citizen, students, fishermen, divers), could be a useful tool for gathering data. We report on our experience of NIS monitoring within the Egadi Islands MPA and at Pianosa Island (National Park of Tuscan Archipelago) through Citizen Science projects. The Projects “*Caulerpa cylindracea* – Egadi Islands” and “Aliens in the Sea” allowed to gather useful information on the distribution and colonisation strategies of 7 NIS and 2 cryptogenic species within the Egadi Islands MPA. The project “Percorsi nel blu/Blue Paths” allowed to register the first record of two cryptogenic species, *Aplysia dactylomela* (Rang, 1828) and *Percnon gibbesi* (H. Milne Edwards, 1853), at Pianosa Island. As in MPAs the protection does not hinder the introduction and spreading of NIS, we expect they are likely to continue to arrive and expand in the absence of effective management actions. In this respect, Citizen Science activities (e.g. monitoring and surveillance plans, public campaigns raising awareness in tourists and stakeholders) certainly could usefully support not only the research on NIS but also their management in MPAs.