

Relationship Between Marine Protection and Functional Diversity of Macrobenthic Community in Mangrove Ecosystems

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Abstract

Marine ecosystems are continuously being threatened by anthropogenic disturbances such as overexploitation, pollution, and coastal development. In order to limit or restrict human activities in marine environment, declaration of Marine Protected Areas (MPAs) was initiated as a conservation and management tool in maintaining biodiversity and ecosystem health. However, marine protected areas are usually designed based on their structural components. Therefore, there is also a need to assess the effectiveness of this management tool according to the ecosystem's functional component. Benthic macroinvertebrates are deeply involved in maintaining ecological processes. Analysis of their biological traits can provide information about certain aspects of functioning. In a mangrove ecosystem, not much is known about benthic macroinvertebrates compared to its other components. In terms of species composition in benthic macroinvertebrates assemblages, the effects of environmental variability are well established. Comparatively, only few studies deal with how variability in environmental conditions are associated with its functional diversity. This study aims to determine the effects of marine protection on the functional diversity of macrobenthic community in mangrove ecosystems of Calatagan, Batangas, Philippines. Specifically, this study intends to: (1) Compare the taxonomic and functional composition and diversity of macrobenthic communities in mangrove ecosystems within and outside a marine protected area; (2) Explore the biological traits of the macrobenthic communities in response to marine protection; and (3) Relate trait analysis with the mangrove ecosystems functioning. Biological traits analysis and functional diversity indices will be used in order to assess the relationship between marine protection and functional diversity of macrobenthos in mangrove ecosystems. It is possible that macrobenthic communities of mangrove ecosystems located within MPAs will have higher functional diversity than those located in disturbed mangrove ecosystems.

Keywords: marine protection, benthic macroinvertebrates, functional diversity, biological traits, mangrove ecosystems