Better understanding of the state of pelagic habitat through the assessment of plankton functional and phylogenetic diversities

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Indices of diversity could be considered as tools for biodiversity management purposes, such as required in the frame of the Marine Strategy Framework Directive (MSFD) building in Europe. However, few of the numerous developed indices in the scientific literature are on use. This is partly linked to the difficulty to link them to environmental/pressure management objectives in relation to our lack of understanding of the factors ruling their fluctuation. Most of these indices are usually based on taxonomic metrics, which represents only one facet of biological communities. Other facets can actually bring valuable information, such as functional diversity based on traits, or phylogenetic diversity, based on evolutionary relationships. These types of metrics are increasingly recognized to have a greater potential in revealing relationships with environmental gradients. Different diversity indices based on both functional traits and phylogeny have been here considered using French and Spanish marine plankton time-series. The potential of these indices to be used as tools for biodiversity management is investigated and the choice for specific functional traits and phylogenetic aspects is presented. This study, part of the European ongoing project EcApRHA, aims to the more the general goal to combine different diversity indices based on several facets of a plankton community in order to depict a holistic image of pelagic habitat diversity.

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