A comparison among coralligenous-based indices for the assessment of the marine ecological quality

Giulia Gatti[*1], Luigi Piazzi[2], Thomas Schon[3], Romain David[1], Monica Montefalcone[4], Jean-Pierre Féral[1], and Stéphane Sartoretto[5]

[1]Institut méditerranéen de biodiversité et d'écologie marine et continentale (IMBE) – Université d'Avignon et des Pays de Vaucluse, Institut de recherche pour le développement [IRD] : UMR237, Aix Marseille Université, CNRS : UMR7263 – Station Marine d'Endoume, Chemin de la Batterie des Lions, 13007 Marseille, France

[2]Department of Natural and Territorial Science, Sassari University – Italy

[3]Aix-Marseille University – Aix-Marseille Université - AMU – France

[4]Department of Earth, Environment and Life Science (DISTAV), University of Genoa – Italy

[5]French Research Institute for the Exploitation of the Sea (IFREMER) – Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER) – France

Abstract

Mediterranean coastal areas host the endemic biogenic reefs commonly known as "coralligenous". A morphologically complex calcareous substrate allows developing highly diverse sessile assemblages, offering shelter and food to a rich community of vagile invertebrates and fishes. The extreme spatial variability and the operational restrictions imposed by scuba diving at depths where coralligenous reefs usually develop limited the studies aimed at assessing their health status. Only recently, some coralligenous-based indices to evaluate marine ecological quality have been proposed. The Coralligenous Assemblage Index (CAI – Deter *et al.*, 2012), the Ecological Status of Coralligenous Assemblages (ESCA – Cecchi *et al.*, 2014) index, the COralligenous Assessment by ReefScape Estimate (COARSE – Gatti *et al.*, 2015) index and the Index-Cor (Sartoretto *et al.*, 2014) were compared among each other and against some classical univariate indices (e.g. the Shannon diversity Index).

The four coralligenous-based indices are built on different approaches and combining various metrics. The CAI and ESCA indices are both based on photographic sampling and image analysis; on the contrary, the COARSE index is based on direct *in situ* observations, while the Index-Cor integrates photos and direct observations. Image analysis methods differ among CAI, ESCA and Index-Cor. The metrics considered by the indices vary from the simple abundance of some taxa/groups, to the sensitivity of species to different pressures, to structural and functional metrics.

Results showed that the indices are not always concordant in indicating the ecological quality of coralligenous habitats and costal waters, some metrics being more sensitive to the increasing pressure levels.

Keywords: coralligenous, index, ecological quality

---

[*]Speaker