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FORM FOR ABSTRACTS PRESENTATION

TITLE:
CORALLIGENOUS CLIFFS IN TUSCANY: DISTRIBUTION, EXTENSION OF THE HABITAT AND STRUCTURE OF ASSEMBLAGES

SESSION: FLORA E FAUNA

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ABSTRACT

Coralligenous reefs are the main biogenic constructions of the Mediterranean Sea which are considered indicators of the ecological quality of coastal systems and of "seafloor integrity" by the Marine Strategy Framework Directive. The two main coralligenous morphologies are the coralligenous cliffs and platforms, the former developing in shallow waters (about 20-50 m) on vertical/subvertical rocky substrate and the latter built over horizontal substrates below 50 m depth also on detritic bottoms. The present study aims at assessing the distribution and extension of the coralligenous cliffs in Tuscany and describing the structure and the patterns of spatial variability. The mapping of seabed was obtained through Multibeam echosounder (MBES) data coupled with video images recorded by using a Remote Operating Vehicle (ROV) equipped with a high-resolution camera. Data were collected along the coasts and continental shelf of Tuscany for a total of 261 km of coastline corresponding to the 87 % of the rocky coasts in the region. Coralligenous cliffs were sampled by SCUBA divers in 11 sites (sectors of rocky costs) following the STAR procedure (Piazzi et al., 2019). In each site, two areas several kms apart were chosen. At each area, three plots of about 4 m^2 where randomly selected on a vertical rocky substrate at 35 m depth. In each plot, ten photographs of 0.2 m^2 areas were collected by a framed camera. The percentage cover of the main groups was assessed by manual contour technique using the ImageJ software. Data were analised though PERMANOVA with a multi-factorial model including the factors Site (Livorno, Argentario, Gorgona, Capraia, Elba nord, Elba est, Pianosa, Montecristo, Giglio, Giannutri and Formiche di Grosseto) as fixed, Area (2 levels) as random and nested in Site, and Plot (3 levels) as random and nested in Area.
The suface extension of the Coralligenous cliffs may be estimated about the 60% of Tuscany rocky coast.
PERMANOVA detected a significant variability at all examined spatial scales. The assemblages of continental coasts segregated from those of islands and were mostly characterized by algal turf, encrusting sponges and *Corallium rubrum* (Fig. 1). The southern islands (Giglio, Montecristo and Formiche) were separated from the others and mostly characterized by terete and flattened Rhodophyta, *Eunicella* spp., *Paramuricea clavata* and erect bryozoans. The other Island had high abundance of *Flabellia petiolata*, *Halimeda tuna* and massive sponges (Fig. 1). Gorgona was separated from all others sites and showed a high abundance of *Peyssonnelia* spp.
The assemblages mostly varied at large (among sites) and small (among samples) spatial scales (Fig. 2), confirming a pattern already highlighted in previous studies (Piazzi et al. 2016). The variability at small scale may be attributed to the patch distribution of assemblages mostly due to the high heterogeneity of biogenic substrate (Piazzi et al. 2016).

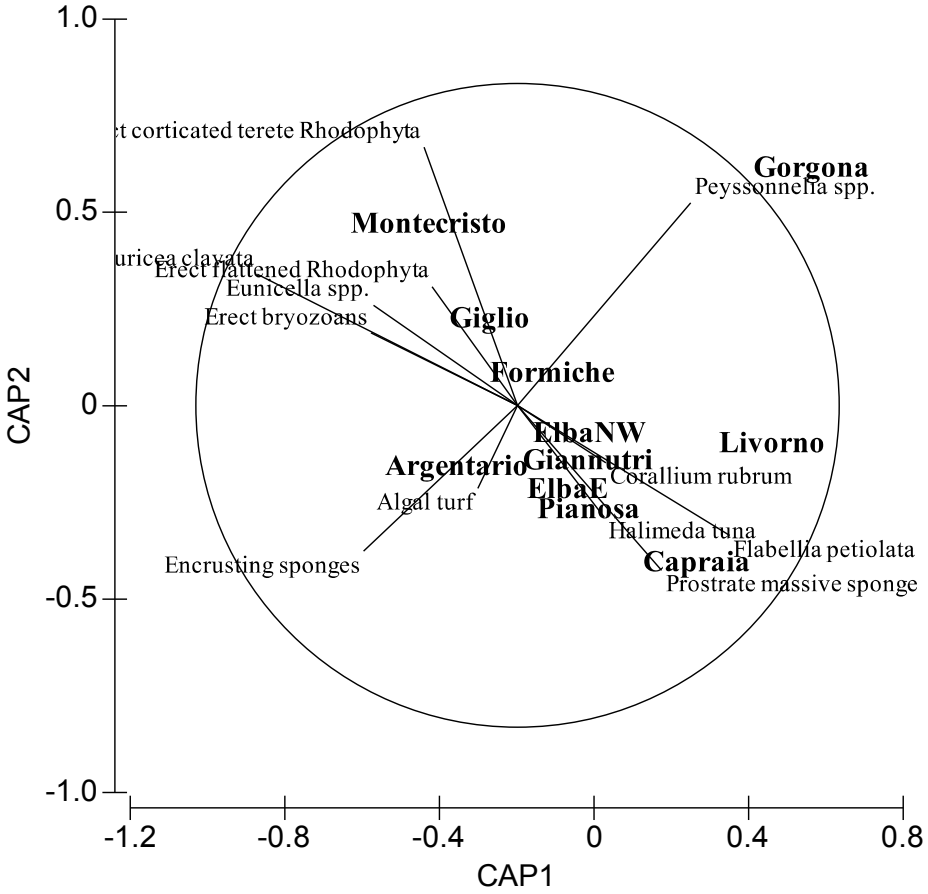

Figure 1. CAP analysis on Tuscany coralligenous assembalges

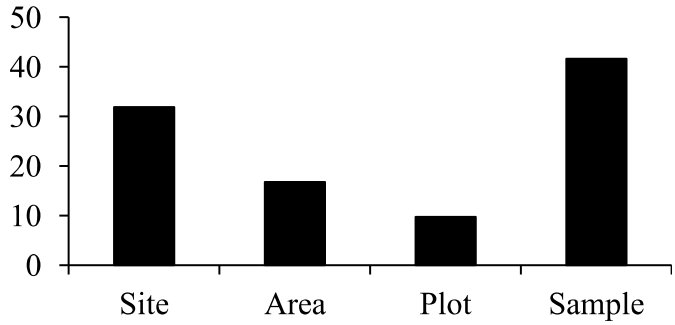

Figure 2. Pseudo-variance components at the examined spatial scales of the Tuscany coralligenous assemblages

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1.Piazzi, L., La Manna, G., Cecchi, E., Serena, F., Ceccherelli, G., 2016. Protection changes the relevancy of scales of variability in coralligenous assemblages. Estuar. Coast. Shelf Sci. 175, 62-69.

2.Piazzi, L., Gennaro, P., Montefalcone, M., Bianchi, C.N., Cecchi, E., Morri, C., Serena, F., 2019. STAR: an integrated and standardized procedure to evaluate the ecological status of coralligenous reefs. Aquat. Conserv. Mar. Freshw. Ecosys. 29, 189-201.