

DISCLOSING THE MESOPHOTIC BIOGENIC REEFS OF THE NORTHERN ADRIATIC CONTINENTAL SHELF

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Marine Mesophotic Biogenic Habitats (MBHs), lying in twilight conditions, have recently drawn the attention of researchers due to the opportunities offered by the implementation of underwater exploration techniques. These habitats are often considered protected from natural and anthropogenic disturbances (e.g. wave action, thermal stress, pollution, harvesting) affecting shallow habitats. Their possible role as refuges for threatened species has been hypothesised. Studies, carried out mostly in tropical areas, stressed the relevance of these habitats, but little is known about their distribution and role in temperate seas, and on their resistance and resilience to anthropogenic impacts and threats due to Global Climate Change (GCC). Northern Adriatic MBHs are mainly represented by coralligenous outcrops scattered on the sedimentary continental shelf. MBHs are arranged in metapopulations, potentially exposed to local extinctions due to their fragility and isolation. Recent investigations highlighted variations in species diversity at different spatial scales, ranging from single outcrops to basin. A complex geographic pattern of the most abundant species, including the main reef builders (i.e., encrusting calcified Rhodophyta) and borers (e.g., the bivalve *Rocellaria dubia* and sponges *Cliona* spp.), was found. Coralline algae (e.g., *Lithophyllum incrustans*), sponges (e.g., *Chondrosia reniformis*) and colonial ascidians (e.g., *Polycitor adriaticus*) were the drivers of the observed spatial differences, in terms of species turnover (β diversity). Role of environmental parameters in determining spatial patterns of distribution have been tested using a large scale habitat suitability model. Moreover, diversity of benthic assemblages is driven by recruitment dynamics and asexual reproduction. However, processes supporting the spatial complexity of these habitats are still unknown. Connectivity among populations, bioconstruction/erosion ratio, and species responses to human threats, increasing water temperature and acidification are the core of a research project aimed at estimating resistance and resilience of these assemblages, and predicting future MBHs distribution under GCC scenarios (<https://reefresearch.jimdo.com>).