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SPATIAL HETEROGENEITY OF BENTHIC COMMUNITIES IN A MARINE CAVE OFF LESVOS ISLAND (AEGEAN SEA)

Abstract

Spatial heterogeneity of benthic communities was surveyed in a marine cave off Lesvos Island (Aegean Sea, Eastern Mediterranean). Quadrats were photographed along 3 transects: one along the cave ceiling and two along the opposing vertical walls. Analyses revealed a rich fauna of 64 taxa belonging to 9 taxonomic groups. Sponges were the dominant group in terms of species richness, followed by bryozoans and cnidarians. Species richness and biotic coverage decreased towards the interior. Three distinct assemblages were identified: the coralligenous entrance where encrusting rhodophytes, sponges, and anthozoans prevailed, the middle semi-dark zone dominated by sponges, and the dark interior dominated by serpulids. Topographic features of the cave had a significant effect on the structuring of the community, highlighting the role of cave topography in the observed patterns.

Key-words: Marine caves, sessile benthos, spatial heterogeneity, zonation, Aegean Sea

Introduction

Scientific interest on sciaphilic hard substrate communities has increased over the last years due to their rich diversity and conservation value. However, marine caves remain poorly explored and available data on the diversity and structure of their communities mainly concern shallow caves from the north-western Mediterranean. Marine caves are characterized by profound environmental gradients, reflecting individual topographic features (Riedl, 1966). Nevertheless, few studies have surveyed quantitatively marine cave communities (e.g. Martí *et al.*, 2004) while the role of topography in their spatial distribution has not been thoroughly examined. The aim of the study was to investigate spatial heterogeneity of benthos in a marine cave of the Eastern Mediterranean.

Materials and methods

Agios Vasilios cave is located at a depth of 23-40 m off Lesvos Island (Aegean Sea). Benthic communities were surveyed with 25 x 25 cm photoquadrats along 3 distinct transects: one along the ceiling and two along the opposing vertical walls of the cave (3 replicates at 5 m intervals). Biotic cover percentage was calculated with photoQuad. Statistical analysis was undertaken with Primer v6. A two-way PERMANOVA was performed on fourth root transformed coverage data, based on Bray-Curtis similarity index, for two factors (Distance from entrance, fixed with 5 levels – 0, 5, 10, 15, 20 m; and Position, fixed with 3 levels – cave ceiling, left wall, and right wall).

Results

Photoquadrat analysis revealed 64 taxa belonging to 9 taxonomic groups. Sponges were the dominant group in terms of species richness (36 species), followed by bryozoans (8) and cnidarians (7). Species richness decreased towards the interior, while cave walls presented lower species richness than the ceiling. Biotic coverage also decreased from 100% in the entrance to 10% in the interior. Multivariate resemblance analysis of