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ASSOCIATED BENTHIC FAUNA TO THE VERMETID REEFS ALONG THE MEDITERRANEAN SPANISH COAST

FAUNA BENTONICA ASSOCIATA AI REEF A VERMETI LUNGO LA COSTA SPAGNOLA MEDITERRANEA

Abstract - The aim of this study was to investigate the benthic fauna associated to nearshore vermetid reefs. Sampling was conducted along the Mediterranean coast of Spain, in three different areas, using scraping techniques, to characterize the taxonomic assemblage living among and inside the *Dendropoma* empty shells. The results showed high abundance and very low taxa diversity.

Key-words: reef formation, biodiversity, vermetids, Mediterranean Sea.

Introduction - Vermetid reefs are bioconstructions built up by the gastropod mollusc *Dendropoma petraeum* (Monterosato, 1884) on the rocky shores exposed to the wave action, in warm waters of the Mediterranean Sea (Laborel, 1987). Vermetid reefs have a very complex morphologic structure. As ecosystem engineer (Jones *et al.*, 1994), *D. petraeum* attaches its shell on rocky shores, producing a dense cluster, increasing the surface of abrasive platforms and creating new microhabitats leading to a high community diversity along the intertidal fringe (Chemello, 2009). To date, despite the existence of several studies describing the biology and morphology of vermetid gastropods, very few data are available on reefs biodiversity (Mannino, 1992; Chemello *et al.*, 1998; Badalamenti *et al.*, 1998). The aim of this work is to investigate on abundance and composition of benthic fauna structure associated to Spanish vermetid reefs.

Materials and methods - The study was carried out along the Mediterranean coast of Spain (from 37°37'N-00°42'W to 38°46'N-00°12'W). Three rocky intertidal sites (Cabo de Palos, Punta Prima and Jávea) were surveyed between September and October 2013. For each site, three random replicates (10×10 cm) of *D. petraeum* were collected using hammer and chisel, from the outer edge of the reefs, where the living vermetid multilayer does not exceed 2 cm in thickness. The *Dendropoma* aggregations were analysed and the isolated invertebrates were examined under a stereomicroscope. The identification of benthic fauna was conducted at a high taxonomic level and data were reported as abundance (N), taxonomic richness (S), Shannon-Wiener diversity index (H') and Pielou evenness (J). Cluster analysis, based on Bray-Curtis similarities, was performed to compare the similarity of benthic fauna among the three stations of vermetid reefs.

Results - A total of 11,170 individuals were identified, belonging to 10 taxonomic groups (Fig. 1) with a mean among the replicates of 1241.22±280.22 ind/dm². While the mean values of the Shannon-Weiner diversity index (H') and evenness index (J), among the replicates, were 1.032±0.146 and 0.476±0.059 respectively. 95% of the total abundance belongs to 3 groups (Crustacea Malacostraca, 57%; Polychaeta, 32%; Mollusca, 6%), while the remaining 7 taxonomic groups only accounts for 5% of

total abundance. Cluster analysis showed the higher similarity between Cabo de Palos and Jávea (93.48%), but similarity values associated to the third station (Punta Prima) are also rather high (82.91%).

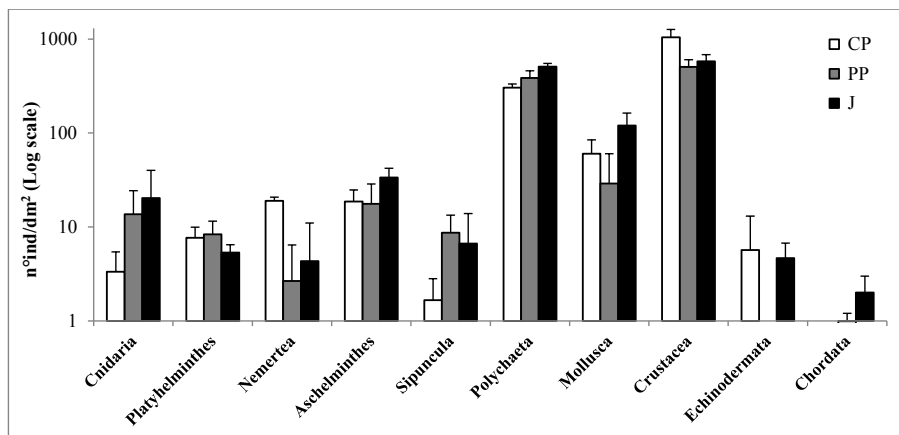


Fig. 1 - Mean number of individuals (\pm SD) of faunal taxocoene associated to the vermetid reefs in the three sampling sites: Cabo de Palos (CP), Punta Prima (PP) and Jávea (J).

Numero medio di individui (\pm DS) della fauna associata ai reef a vermeti nei tre siti di campionamento: Cabo de Palos (CP), Punta Prima (PP) e Jávea (J).

Conclusions - In all the investigated sites, 10 taxonomic groups compose the vagile fauna associated to the vermetid reefs, but only three of them (Crustacea, Polychaeta and Mollusca) contribute to 95% of the total abundance, that results in low values of evenness index. A high fauna density is associated to the vermetid reefs, confirming their important role in enhancing vagile fauna in shallow waters along coastline (Chemello *et al.*, 2000). In fact, the physical structure of *D. petraeum* bioconstruction is an important factor affecting the distribution of benthic invertebrates, that may live on, among and inside the shells, that therefore provide a high diversity of suitable microhabitats (Jones *et al.*, 1994).

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