



***Sabellaria alveolata* (Linnaeus) reefs in the central Tyrrhenian Sea (Italy) and associated polychaete fauna**

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Abstract

The aim of this research was to analyze the morphological features of *Sabellaria alveolata* reefs and the associated polychaete fauna in three different coastal areas of the Tyrrhenian Sea (Mediterranean Sea, Italy). We assessed the relationship between the physical structure of the reefs and the associated fauna. We also investigated possible connections between polychaete assemblage structure and reef development on spatial and temporal scales. Reefs were morphologically described, and the polychaete assemblages were studied using community indices, as well as multivariate and univariate statistics. Three different reef states were described, linked to their respective phase of development. The structure of the associated polychaete assemblages differed according to the relevant reef's phase of development. Species richness was high in reefs in destruction phase, while it decreased in recovering reefs.

Key words: Sabellariidae, bioconstruction, Mediterranean Sea, Polychaetes, associated fauna

Introduction

Sabellaria alveolata is a gregarious polychaete species that uses sand to build its tube, which is characterized by a "sand crown." These tubes develop communally into biogenic structures that may reach several kilometers in length (Pawlik 1988). These bioconstructions provide a habitat for benthic vertebrates and invertebrates (Bianchi 2001; Done 1995; Gruet 1982). *S. alveolata* reefs are usually found intertidally, and sometimes subtidally (Gruet 1982). Sabellariid reefs have been studied on the coast of South America (Lana & Bremec 1994), Brazil (Lana & Gruet 1989), India (Achary 1969), the coasts of Great Britain and Ireland (Mettam 1992; Bamber & Irving 1997), Portugal (Dias & Paula 2001), and the northern coast of France (Volveille 1963; Gruet & Boudier 1997; Dubois et al. 2006). *S. alveolata* has been also studied in the Mediterranean Sea on the French coast (Bellan 1964), Spain (Porrás et al. 1996), and Italy (Sparla et al. 1992; Gambi et al. 1996; La Porta et al. 2006). *S. alveolata* reefs occur in two forms (Dubois et al. 2002). Some reefs are built as structures adhering to rocks, and are very common at the mid-level of the intertidal zone. The second are reefs spread over several acres on sand flats in the low intertidal zone (Gruet 1982). Reefs are ball-shaped and can evolve to form platforms or barrier structures with varying sizes of extensions on the sandy beach (Gruet 1982). According to Gruet (1986), the reef's development can be summarized in four different periods: (1) primary settlement phase, (2) growth phase, (3) stagnation phase, and (4) destruction phase. The morphological features of *S. alveolata* reefs (reef compactness, tube orientation, percentage of tubes with "sand crown," the presence/absence of epibionts and the