

**Polychaete Communities in the Mediolttoral and Infralittoral zones
of the Western Mediterranean : two cases of study, the Balearic
Islands and the Straits of Gibraltar**

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Description of the structure of macrobenthic communities has been one of the major goals in benthic marine studies since the pioneering works. The results of macrobenthic community monitoring typically produce larger groups of species and there is a tendency to reduce the data to group of few species which can be well correlated with those assemblages or communities. The fauna of the community can also be arranged by functionally similar groups of species (guilds) to give an idea of the interaction between the organisms and their habitat.

A faunistic study of the Benthic Invertebrate Populations of the Balearic Islands (Spanish Coast) was carried out in the Zoology Department of the University of Barcelona in 1983 and 1984. A similar study was done in the Straits of Gibraltar in 1981-1984. The main aim of these studies was to correlate the different assemblages of Annelida Polychaeta in the Mediolttoral and infralittoral zones with the surrounding vegetal zonation. Almost 200 samples of 400 cm² (20 cm x 20 cm) were scraped off and quantitatively studied in these works.

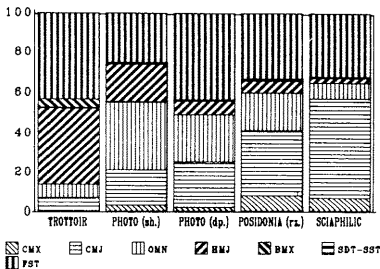
Light is considered as the main factor determining changes in vegetable zonation with depth in the rocky sublittoral environment. The structural organization in the Straits of Gibraltar was studied for depths between 0 and 15 m due to the strong light attenuation caused by the turbidity of the water. The very clear water of the Balearic islands mean that the critical light level is at depth of 40 m, photophilic algal species can be found in these islands at a greater depth than their homologues in the Iberian peninsula and have a wider sea-belt distributin.

Recently Abbiatti et al. (1987) and Giangrande (1988) proposed the hypothesis that polychaete zonation may be an expression of the biological conditioning of the substrata by algae rather than of the direct influence of physical factors and suggested a model based on three communities in the Romito cliff. This model fitted quite well with the observed model for the Straits of Gibraltar, Sardá (1987).

The results of these studies demonstrate the existence of six Polychaete communities associated to hard bottoms in the mediolttoral and infralittoral zones. The six communities were defined on the basis of their specific composition, trophic-functional structure, diversity and relative abundance and dominance of the species present.

- (1) The mediolttoral exposed community.- (Strait of Gibraltar). R=22.2, H'=2.4. The community is dominated by few species of well adapted organisms mainly herbivorous: Eulalia viridis, Syllis amica, Perinereis cultrifera, P. marionni, Platynereis dumerilii and Nainereis laevigata. (*)
- (2) The mediolttoral community of Lythophyllum tortuosum.- (Balearic Islands). R=15, H'=2.6. Fabricia sabella and Platynereis dumerilii account for more than 50% of the fauna by number. These two polychaetes are accompanied by a group of common species in mediolttoral environment and the impoverished presence of the photophilic group. (*)
- (3) The shallow photophilic community.- (Strait of Gibraltar & Balearic Islands). R=35.5, H'=3.9. The species Sphaerosyllis hystrix, Polyophthalmus pictus, Syllis prolifera, Pseudobrania clavata, Janua pseudocorrugata, Exogone naidina, Pseudobrania limbata, Amphiglena mediterranea and Platynereis dumerilii dominate the community, 70-80% of all organisms belong to those species. The community is also characterized by the absence of species favoured by mediolttoral conditions or by the coraligenous species. (*)
- (4) The deeper photophilic community.- (Balearic Islands). R=31.5, H'=2.9. The community is defined with four dominant species: Exogone naidina, Pseudobrania limbata, Amphiglena mediterranea and Josephella marenzelleri. A reduced and less abundant group of the typical infralittoral species is found and a group of coraligenous species is normally present. (*)
- (5) The community of rhizomes of Posidonia oceanica.- (Balearic Islands). R=61.7, H'=4.6. The Posidonia rhizomes allow colonization by a mixture of different groups of species. None of these groups has a major relative abundance. (*)
- (6) The infralittoral sciaphilic community.- (Strait of Gibraltar & Balearic Islands). R=35.7, H'=3.9. A group of species including Chrysopetalum debile, Autolytus prolifer, Pionosyllis lamelligera, Syllis truncata-criptica and Spirobranchus polytrema are the most numerous although a group of lesser dominants are also important to characterize the community. (*)

The species present can be classified into eight trophic-functional groups. Substrata characteristics play an important role in allowing the appearance of different ecological niches which enables the development of living strategies. Omnivorous and Herbivorous species decrease and Carnivorous species increase progressively when algal distribution becomes less abundant. Sessile filter-feeders are constantly present in the communities listed although sabellids are replaced by serpulids when strong light-attenuation is observed. Deposit-feeders and Burrowers are not common in these habitats. Percentages of organisms belonging to these groups in the communities can be observed in the figure.



REFERENCES

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(*).- (R)= Average richness. (H')= Average diversity (Shannon index).