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## QUANTITATIVE DOMINANCES OF *TAXA* STRUCTURING THE MACROZOOBENTHIC COMMUNITIES LIVING IN DIFFERENT COASTAL HABITATS

### *DOMINANZE QUANTITATIVE DI COMUNITÀ MACROZOOBENTONICHE IN DIVERSI HABITAT COSTIERI*

**Abstract** - The aim of this study was to quantify the dominance of macrozoobenthic taxa structuring the benthic assemblages associated to 6 coastal habitats, which occur from the mesolittoral to the circalittoral zone of the Campania coast. Crustaceans, polychaetes and molluscs were the main taxonomic groups structuring all the benthic assemblages, representing an average of 89.20% of the total taxa. However, each habitat showed the dominance of only one peculiar taxon.

**Key-words:** *macrobenthos, taxa, quantitative dominance, habitats.*

**Introduction** - The Mediterranean Sea is widely known as a hotspot of biodiversity, which is distributed in relation to different biological interactions among species and environmental conditions, such as temperature, changing along latitudinal gradients and/or bathymetric gradients, and hydrodynamism, affecting mainly the intertidal zone. An extensive literature reports molluscs, crustaceans and polychaetes as the main taxonomic groups of macrobenthic assemblages for the marine ecosystems health assessment (e.g. Gambi *et al.*, 1992; Tomiyama *et al.*, 2008; Donnarumma *et al.*, 2018). These taxonomic groups include sensitive and tolerant species to natural or human stressors, commonly known as indicator species through which the environmental quality of ecosystems or habitats is better understood (Zettler *et al.*, 2013). The aim of this work is to evaluate the quantitative dominance of macrozoobenthic *taxa* associated to several different habitat types, occurring from the mesolittoral to the circalittoral zone.

**Materials and methods** - The study area was located along the Campania coast (Tyrrhenian Sea), where 6 different habitats were investigated with a sampling site for each one. Within the Marine Protected Area (MPA) of Santa Maria di Castellabate (Gulf of Salerno), during summer 2013, three replicate samples (10×10 cm) of vermetid bioconstructions (VB) were collected in the intertidal environment using hammer and chisel. In the same MPA, during summer 2015, three replicate samples of soft bottom (SB) mainly characterized by fine sandy-muddy sediment, *Posidonia oceanica* (L.) Delile seagrass bed (HP), photophilic hard bottom covered by algal turf (PHB) and sciaphilic hard bottom covered by bioconstructions (C, coralligenous habitat) were sampled using an air-suction pump according to Chemello and Russo (1997), within different frames: 50×50×10 cm in SB, 100×100 cm in HP and 40×40 cm in C and PHB, at an average depth respectively of about 20 m, 15 m, 10 m, 30 m. In addition, in the southern coast of the Capri Island (Gulf of Naples), during summer 2016, six replicates of the rhodolith beds were collected using a 25 l Van-Veen grab, between 53 and 62 m of depth. All samples were fixed in 4% formaldehyde/seawater solution and successively benthic fauna was sorted and identified at a high taxonomic level, estimating abundance and taxonomic richness in order to obtain the quantitative

dominance (DI%) of each *taxon* and its preferential occurrence among the 6 investigated habitats.

**Results** - Among a total of 8 taxonomic groups detected in 6 habitats, only polychaetes, crustaceans and molluscs were dominant, with a total average percentage of 89.20%, and a *taxon* average percentage respectively of  $39.22 \pm 0.17\%$ ,  $33.19 \pm 0.19\%$  and  $16.79 \pm 0.14\%$ . Sipunculids represented the fourth *taxon* for abundance ( $4.90 \pm 0.04\%$ ), while the remaining *taxa* (echinoderms, brachiopods, nemerteans and platyhelminths) reached a total dominance of only 5.94%. Within the 6 habitats, a different dominance of the three main *taxa* occurred. Polychaetes were dominant in SB, RB and C habitats (60.65%, 54.87% and 45.91%, respectively), crustaceans were dominant in the VB and PHB habitats (59.62% and 50%, respectively) and molluscs in the HP habitat (38.22%).

**Conclusions** - The analysis of the benthic fauna, at higher taxonomic level, carried out in 6 different habitats, confirms the importance of polychaetes, crustaceans and molluscs as the main components of benthic community assemblages (DI 89.20% of the total *taxa*), from which it is necessary to start through further taxonomic studies at species level for a deeper understanding of the environmental state. The present investigation also highlighted which *taxon* plays a dominant role in each of the 6 habitats investigated, coherently with the major structural characteristics of the habitat itself. High dominance of crustaceans indirectly might suggest high availability of crevices in vermetid bioconstructions (Holdich, 1971); dominance of polychaetes in rhodolith beds could be related to the degree of rhodolith-form complexity (Figueiredo *et al.*, 2007); dominance of molluscs in *P. oceanica* beds might be related to a relevant epiphytic algal biomass on seagrass leaves (Mazzella and Russo, 1989).

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