MEIOFAUNA OF THREE BACK-REEF SANDY PLATFORMS IN MALDIVE ISLANDS

MEIOFAUNA DI TRE PIATTAFORME SABBIOSE DI RETROSCOGGLIERA NELLE ISOLE MALDIVE

Abstract - Meiofauna from three back-reef sandy platforms in Maldive Islands has been investigated during May 2007. A well diversified and abundant meiofaunal community was generally found except at Thoddoo Island, where the effects of a strong erosion were detected on the sea-bottom. The possible consequent selection of a meiofaunal assemblage well adapted to high physical disturbance is discussed.

Key-words: meiobenthos, free-living nematodes, hydrodynamism, sediment, Maldive Islands.

Introduction - An intercollegiate research project on the biodiversity and ecology of meiofauna from Maldive Islands has been carried out since 2004 with the aim of widening the scanty and fragmentary knowledge (Gallo D'Addabbo et al., 2006; Sandulli et al., 2006a,b; Semprucci et al., 2006, 2008; and references therein). The present study focuses on the relationships between meiofauna and sediment type as well as hydrodynamic conditions in three Maldivian back-reefs platforms.

Materials and methods - Sediment samples were collected during the ‘Albatros Top Boat’ Scientific Cruise in May 2007 by diving at different depths (0.20-21.5 m) along 3 transects: 1) South Malé Atoll (Gulhi Island, 4 stations); 2) North Ari Atoll (Rasdhoo Atoll, 3 stations) and 3) Thoddoo Island (4 stations). Meiofauna were narcotized with 7% MgCl₂, fixed in 5% neutralized formalin, and extracted from the sediment by flotation and multiple decantation, and in some cases by centrifugation in silica-gel gradient (Ludox HS 30, density 1.18 g/cm³). All animals were sorted per taxon and counted under the stereomicroscope.

Results - The sampled sediments were prevalently coarse and medium sands with a very poor silt fraction. The average density of the total meiofauna ranged between 46,04±28,96 ind. 10 cm⁻² (T3) and 2772,14±1547,0 ind. 10 cm⁻² (T1). The community was made up of 15 major taxa, mainly copepods and nematodes, 66% and 20% respectively, followed by turbellarians and polychaetes. The meiofaunal composition, abundance and diversity (H’ 0.56-2.29; J 0.28-0.71) appeared comparable to those observed in the back-reef platforms communities sampled in Felidhoo and Malé Atolls during the 2005 Scientific Cruise (Semprucci et al., 2008). Only at Thoddoo Island, and in particular in the transects 1, 2/3, 3, very low meiofaunal densities and diversity were recorded. Greater differences among the stations (R=0.60; p=0.001) than among the transects (p>0.05) were detected by the Analysis of Similarity (ANOSIM), mainly related to the above mentioned Thoddoo stations. In contrast, significant differences of H’ both among the transects and the stations (p<0.001) resulted from the Analysis of Variance (ANOVA). Also, Post hoc tests (LSD test) indicated the Thoddoo Island as the locality with the lowest meiofaunal diversity values. Field observations and sedimentological analysis pointed out the presence of a longshore current which likely produced the wide depression in which the samples 3/1, 3/2 and 3/3 were collected, also causing the outcrop of old coral rocks on the sea-bottom. These
strong erosion effects might have led to a drastic reduction of meiofaunal density and diversity, selecting a community markedly dominated by nematodes (91-70% of the total). These results seem to be supported by the presence of Desmodoridae (mainly *Spirinia*), Draconematidae (*Dracognomus*) and Epsilonematidae (*Epsilonema* and *Perepsilonema*), all taxa related to heterometric sediments, and consequently to variable energetic conditions or to high hydrodynamic stress (Platt and Warwick, 1988; Raes *et al.*, 2007). The relation between meiofauna and sediment grain size, which was already observed in a previous study (Semprucci *et al.*, 2008), has been confirmed. In particular, Spearman correlation analysis showed that gastrotrichs, polychaetes, and ostracods were strongly and positively correlated with the 1000 µm class (p<0.01), more significantly than *nauplii* and oligochaetes (p<0.05).

**Conclusions** - This investigation has confirmed the existence of a well diversified meiofauna in carbonate sediments of the Maldives. The distribution and diversity of the community appear to be influenced not only by the sediment types, but also by hydrodinamism.

**References**


