Studies on the distribution of zoobenthos on the North Sardinian Coast*

E. H. SCHULTE
Laboratory of Marine Contamination, CNEN-EURATOM, Fiascherino, Italy

Summary: Mean values for the distribution of macrozoobenthos have been found to be very low (~60 individuals/m^2/station). The dominant groups were represented by Bivalvia (28,72%), Polychaeta (24.80%) and Crustacea (15.53% of the total groups found). Total medium biomass amounted to ~50 g dry weight/m^2/station.

Résumé: Les valeurs moyennes de la distribution du macrozoobenthos sont très faibles (~60 individus/m^2/station). Les groupes dominants sont représentés par les bivalves (28,72%), les polychètes (24,80%) et les crustacés (15,53% du total des groupes). La biomasse totale moyenne est d'environ 50 g de poids sec/m^2/station.

During three subsequent years the macrozoobenthos (0.2 mm Ø) was sampled in 12 stations inside the La Maddalena Archipelago. Of every species determined the fresh and dry weights per m^2 have been calculated. Sampling areas (3-15 m depth) belong to the infralitoral zone extending from the surface down to 40 m depth and characterized by many photophilous seaweeds (Ulva, Padina etc.) and the truly marine phanerogams (Posidonia, Zostera) (Pérès, 1967).

Mean values for the distribution of species in the various stations have been found to be quite low. Only ~60 specimens/m^2/station could be detected. Higher populations were found at the innermost stations; however, the biomass was relatively small (FW ~40 g/m^2; DW~10 g/m^2) while the remaining stations showed much higher values (FW 565 g/m^2; DW 255 g/m^2) due to higher populations of echinoderms which by mistake had been weighed with their shells.

The dominant groups of benthos were represented by Bivalvia (28.73%), Polychaeta (24.80%) and Crustacea (15.53%) whichcovered more than two thirds (69.05%) of the total groups found. These were followed by Gastropoda (8.55%) and three groups of echinoderms namely Echinoidea (8.48%), Holothurioidea (3.52%) and Ophiuroidea (2.50%). All other groups were less important and represented only 7.1% of the total.

Among the Bivalvia of which a maximum of 80 spec./m^2 were found the following species were the most frequent ones: Modiolus barbatus (32.3 spec./m^2); Ctena decussata (26.7 spec/m^2); Cardium echinatum (18.2 spec/m^2); Chlamys opercularis (16.1 spec./m^2) and Venus

* Work carried out under the Contract CNEN-EURATOM N.172-76-1 BIOI - Rif.: BIO-1545 = ORA / 18.883

verrucosa (12.8 spec./m^2). Of the Polychaeta only the two families Nereidae and Eunicidae have been found with total medium frequencies of 56.8 spec./m^2; 17.4 spec./m^2 and 9.1 spec./m^2 for the most representative genera Eunice sp.; Nereis sp. and Exogene sp., respectively.

The 33 crustacean genera and species identified were represented mainly by Decapoda, Isopoda and Amphipoda. The most frequent species found were: Pagurus sp. (13.7 spec./m^2), Cirolana sp. (13.3 spec./m^2), Elasmopus sp. (10.4 spec./m^2).

Although muddy grounds were widely distributed in the sampling areas only two species of Thalassinidae, typical for this biotope, could be detected with unexpected low population densities (Upogebia sp.: 6.7 spec./m^2 and Callianassa stebbingi: 1.3 spec./m^2). The remaining groups were of minor importance. The following summary shows the most frequent species of each group and their corrisponding distribution: Gastropoda: Euthria cornea (14.6 spec./m^2); Echinoidea: Paracentrotus lividus (48.4 spec./m^2); Holothurioidea: Cucumaria sp. (10.7 spec./m^2) and Ophiuroidea: Amphiura filiformis (5.3 spec./m^2). Further details regarding the distribution of other groups found are reported elsewhere (Schulte 1978).

Total biomass was negligible; on the average ~50 g dry weight/m^2/station were determined of which more than 90% were due to echinoderms while the remainder (~8%) consisted of all other groups of macrozoobenthos.

In particular there have been determined 0.788 g DW/m^2/station of Polychaeta, 0.783 g DW/m^2/station of Crustacea, 0.757 g DW/m^2/station of Mollusca, 45.847 g DW/m^2/station of Echinodermta and 1.824 g DW/m^2/station of other groups.

Generally all specimens found were very small. Medium length of bivalves, for example, never exceeded 1-2 cm.

The relative small specimens and low population densities especially of molluscs could be direct results of the strong currents present in the archipelago (interferring to the filtration of phytoplankton by bivalves) and of the type of bottom sediments, which mainly consisted of debris of shells of molluscs up to 20 cm depth with little or no sands. Probably these sediments could impede a normal settlement of molluscs and hence prevent normal growth and/or shorten life-span.

References:

Pérès, J.M., 1967; The Mediterranean Benthos, In: Oceanogr. Mar. Biol. Ann. Rev. 5, 449-533; Harold Barnes, Ed.; Publ. George Allen and Unwin Ltd., London

Schulte, E.H., 1978; La distribuzione dello zoobenthos nell'Arcipelago di La Maddalena, Rapporto Tecnico CNEN, RT/BIO(78)28