

DISTRIBUTION OF FEEDING GUILDS OF THE SOFT-BOTTOM POLYCHAETES IN THE GULF OF SALERNO (TYRRHENIAN SEA)

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Resumé

On reporte la distribution des groupes trophiques des Polychètes des fonds meubles du Golfe de Salerno (Mer Tyrrhenienne). Les espèces recueillies en 43 prélèvements entre -2m et -75m en decembre 1981, ont été classées en 11 groupes fonctionnels. On a analysé la distribution de ces groupes aux différents profondeurs. La communauté côtière est dominée par les filtrateurs. Dans les zones plus profondes on observe d'abord une majeure diversification trophique et, dans la vase, une dominance des limivores. Cette zonation est déterminée par plusieurs paramètres qui sont surtout en relation avec la structure des sédiments elle-même tributaire de l'hydrodynamisme.

An interesting problem in the analysis of the distribution of benthic organisms is the relationship between the trophic requirements and the main physico-chemical characteristics of the environment. Some authors have pointed out that in soft-bottoms, feeding behaviour, distribution of species, and sediment structure are generally closely related (MAURER & LEATHEM, 1981, GAMBINO et al., 1982). The present paper considers, for the Polychaeta, how the functional analysis, by feeding guilds, can help to clarify the observed distributional patterns of the species previously obtained by other kinds of analyses (GAMBINO et al., in press.). Polychaetes in 43 samples of benthos collected in December 1981 on soft-bottoms of the Gulf of Salerno (GAMBINO et al., in press.) were grouped into "feeding guilds"; the abundance for each group is a percentage reflecting the abundances of all species in that group. Feeding guilds were identified according to the criteria given by FAUCHALD & JUMARS (1979), except for the group "omnivores". A total of 11,818 individuals belonging to 155 taxa were counted and 11 feeding guilds were identified. To determine the distribution of groups along the depth gradient from the coast to the open sea, five depth zones (2-5m, 5-15m, 15-25m, 25-50m, over 50m) were analyzed and the feeding guilds were arranged in five main groups: Carnivores, Omnivores, Surface deposit-feeders, Burrowers, Filter-feeders (Fig.1). Herbivores were not considered because represented by only few individuals.

In the coastal zone (2-5m) half of the community was characterized by filter feeders (FDT, Fig.1), represented by a single discretely motile species, *Owenia fusiformis* (44.1%), and by the sessile filter-feeders (FST, 6.3%). Other abundant groups were omnivores (OM, 19%) and jawed carnivores (CMJ, 13.4%); also well represented were motile surface deposit-feeders (SDT, 14.9%), whereas all the burrowers (BMX, BMT, BMS) were negligible (0.5%).

In the 5-15m zone, FST, mainly represented by *Chone* spp., increased to 51% whereas FDT, still only represented by *O. fusiformis*, decreased to 7.8%; OM and CMJ remained well represented. Among the detritivores, the motile species (SDT) decreased while the sessile ones (SST) increased. The burrowers were still negligible.

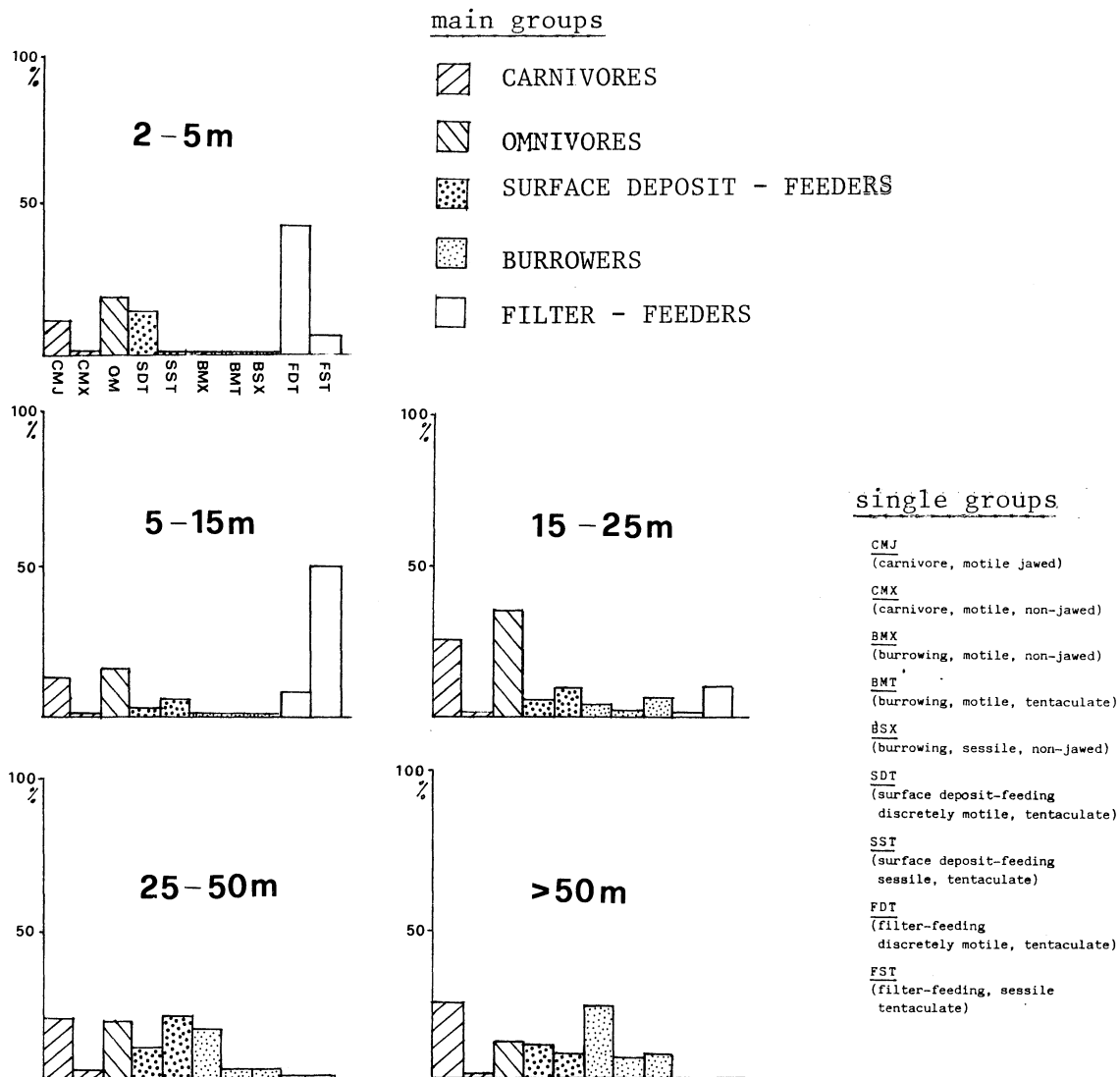


Fig. 1: Percentages of the different feeding guilds in the five depth zones (the initials of the groups are according to Fauchald & Jumars, 1979).

In 15-25m zone all filter-feeders were much reduced and the only species present was *Ditrupa arietina*. CMJ and OM increased and the burrowers began to be more abundant (14.8%). The deposit-feeders (motile and sessile) remained quite constant.

The 25-50m zone showed a more homogeneous distribution of the different groups. The filter-feeders were negligible (0.9%) and also CMJ and OM decreased slightly, whereas both the burrowers (BMX, BMT, BSX) and deposit-feeders (SDT, SST) increased, representing respectively 18.4% and 35% of the total community.

Below 50m the community was characterized by an increase in burrowers, especially motile forms (39.4%). Well represented were also OM, CMJ and deposit-feeders, whereas the filter-feeders disappeared.

The trend of the trophic diversity index (Shannon-Weaver, H') is shown in Fig.2. The lowest value was found in the coastal zone (2-5m) and in general the diversity increased from the coast to the open sea, with a slight decrease below 50m. The highest value was found for the 25-50m zone which was characterized by mixed sediments.

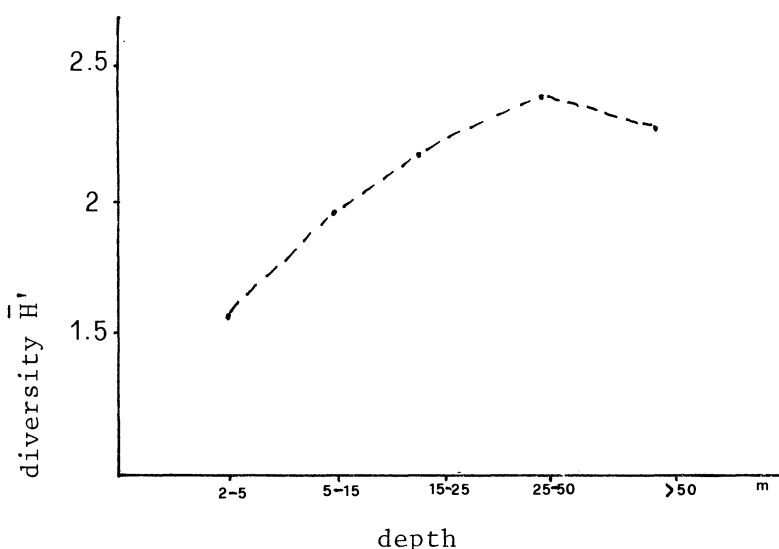


Fig.2: Means of the trophic diversity index (Shannon-Weaver, H') in the five depth zones.

Proceeding along the depth gradient the feeding guilds showed different and characteristic patterns. Filter-feeders are usually abundant in high energy environments exposed to wave action or with strong currents (GRAY, 1981). In zones with low energy, where suspended material is also present, filter-feeders are probably disturbed by sedimentation of fine particles or by the sediment resuspension and reworking by deposit-feeders ("amensalism" hypothesis, GRAY, 1981). In the Gulf of Salerno the dominance of filter-feeders in the shallowest zone is explained by the above considerations and also by this area being under the influence of organic input from the Sele river, which probably enriches the water column and favours suspension-feeders. The dominance of burrowers in the deeper zone is related to the softness of the sediment, since the high level of fine particles (silt and clay) favours penetration and ingestion of the substrate by burrowers, which nearly always eat their way through the sediments. Deposit-feeders are influenced by the presence of detritus in the sediment; in the coastal zone of the Gulf of Salerno they are probably related to the inputs

of the Sele river while in the 25-50m zone they are favourably influenced by normal sedimentation, which increased in this area by the presence of the lower limit of a *Cymodocea nodosa* prairie. The distribution of carnivores and omnivores is not directly related to the sediment structure. In fact, their presence is quite constant at all the depths considered. Their abundance, especially between 15 and 50m, is related to higher number of prey and other food in this depth range. The trophic zonation described and discussed above agrees rather well with the observed species distribution previously obtained with other kinds of analyses (GAMBI et al., in press). This fact suggests that the functional (trophic) adaptability of Polychaetes is under control of a complex gradient: the depth gradient from the coast to the open sea. This gradient reflects an environmental energy gradient (hydrodynamism), perceived by Polychaetes mainly as the physico-chemical structure of the sediments.

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