

Deep benthic fauna of the Mediterranean

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The deep Mediterranean environment exhibits several specific features :

- Deep homothermy at a relatively high temperature (nearly 13°C),
- Deep circulation controlled by more or less sporadic seasonal movements,
- Fast sedimentation rate with a biogenic dominance,

Recent geological discoveries demonstrate that the Mediterranean Sea can be considered as a remarkable natural laboratory to study deep sea colonisation processes since a known event (messinian crisis) relatively recent on a geological time-scale.

Vertical distribution of Mediterranean benthic species shows that more than one third of the species has not been recorded below 50 meters, more than two-thirds below 200 meters, and more than four-fifths below 500 meters. One per cent of the total fauna lives strictly below 2 000 meters, including a small group of "abyssal species". The deepest species already described, the polychaete *Lacydonia laureci*, has been collected at 4 690 meters depth.

The Atlantic origin of the deep-sea fauna is well established. Below 1 000 meters, 20 per cent of the species are known in northern european waters where they generally occurred in shallow areas. The Lessepsian migrants do not contribute to the deep-sea fauna. Typical abyssal groups of the world ocean are missing in the Mediterranean. The deep fauna is mainly composed of very eurybathic species.

The originality of the Mediterranean fauna decreases with increasing depths. With a few exceptions, all deep sea species can be closely related to Atlantic species. There is practically no endemic genera or families in the deep Mediterranean fauna (with the exception of *Uschakovius enigmaticus*, recently considered as the type of a new family within the order Terebellomorpha), which clearly demonstrates its newness.

The polychelids are the only group of panchronic species living in the Mediterranean.

Compared with the North East Atlantic Ocean, the deep Mediterranean fauna is very poor, in terms of number of species (specific diversity) and of number of individuals (densities).

As a conclusion, some future research areas are specially suggested :

- The continuation of the zoological exploration of the lesser known areas including geologically critical settings (Mediterranean ridge and subduction areas, brine deep basins of the Eastern Mediterranean recently discovered, deep-sea cliffs as the Malta escarpment).
- The structure and function of the deep sea Mediterranean ecosystem below 1 000 meters.
- The study of organic fluxes in the deep sea in the central parts of the basins far from margins (recent results have demonstrated the occurrence of deep-sea scavengers (sharks, fishes, decapods, mysids, amphipods) caught using baited traps.
- The use of manned submersibles for in situ experiments, exploration and sampling.