

Zooplankton dynamics in the Western Mediterranean Sea using Carbon and Nitrogen stable isotopes

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Mesozooplankton play a key role in regulating the climate related CO₂ cycle and seafood production and are highly sensitive to climate change and other stressors. The advancement of knowledge of the structure and functioning of these communities has emerged as a useful tool to support conservation and management of marine ecosystems. Carbon and nitrogen stable isotopes ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) analyses can provide important information on major ecological processes. The isotope composition of the mesozooplankton, by reflecting the dietary carbon and nitrogen assimilated into animal tissues, can represent a useful indicator of longer-term environmental changes. The EU project OCEAN-CERTAIN is investigating the impact of climatic and non-climatic stressors on the whole planktonic food web (from viruses to mesozooplankton), the associated biological pump and the important natural and socio-economic feedback mechanisms. Within the framework of this project, a large scale survey was carried out in summer 2015 along transects crossing all the major regional sub basins of the Western Mediterranean Sea. In several representative areas, subject to natural and anthropogenic impacts, abundance, biomass, carbon and nitrogen stable isotope composition of specific mesozooplankton taxa, phospholipid-derived fatty acid (PLFA) composition and bulk stable isotopes analysis of suspended particulate organic matter (POM) were measured. These data allowed to shed light on the source of zooplankton diet and the trophic structure. Matching stable isotope analysis with quantitative studies of mesozooplankton community structure is here used to depict the spatial dynamic and the impact of different trophic conditions.

Keywords: mesozooplankton, stable isotope analysis, Western Mediterranean Sea

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