

Nutrient Dynamics in Eastern Mediterranean Sea, south of Crete island.

A.PAVLIDOU¹, E. ROUSSELAKE², D.VELAORAS³
AND S.PSARRA⁴

¹HCMR, aleka@hcmr.gr

²HCMR, erousel@hcmr.gr

³HCMR, dvelaoras@hcmr.gr

⁴HCMR, spsarra@hcmr.gr

The Eastern Mediterranean Sea is characterized by extremely low nutrient content, particularly at the surface layer. Three main water masses have been recognized in the Eastern Mediterranean Basin: The surface water of Atlantic origin (AW), poor in nutrients, which flows through Gibraltar and the Sicily Straits and spreads to the Ionian and Levantine; the salty, rich in nutrients, Levantine Intermediate Water (LIW) formed in the Levantine basin, flows at intermediate depths (200–500 m) westwards from the Levantine Basin; and the Eastern Mediterranean Deep Water (EMDW). Between LIW and the EMDW a highly uniform layer of minimum salinity, temperature, oxygen and maximum nutrients is observed, called Transition Mediterranean Water (TMW).

In this work, inorganic nutrient (nitrate, nitrite, phosphate, ammonium and silicate) and organic nitrogen and phosphorus characteristics were reported and their spatial (horizontal and vertical) variability under the influence of different water masses was investigated. The data were evaluated together with the analysis of the T–S properties of the water column in order to have a quantitative description of the nutrient content in the different water masses characterizing the study area.

The nutrient distribution in the study area is determined by the biological and biogeochemical processes in the euphotic zone and in the deeper layers, as well as by the water masses circulation. Water of Atlantic origin (AW) has been identified in the surface layer, about 20m thick, with low nutrient (PO_4^{3-} : ~4.0 nmol/L; SiO_4^{2-} : ~1.0 $\mu\text{mol/L}$; $\text{NO}_3^- + \text{NO}_2^-$: 0.07 $\mu\text{mol/L}$). Nutrient distributions show a maximum in the layer between ~400-500 to 1000m, probably related to the TMW water mass. The Deep layer below 3000m (with σ_θ ~29.19) is characterized by phosphate values of 180 ± 15 nmol/L, nitrate+nitrite values 4.83 ± 0.12 $\mu\text{mol/L}$ and silicate values 7.95 ± 0.27 $\mu\text{mol/L}$ and is related to the EMDW. Water masses circulation, the possible influence of the Rhodes gyre and the productivity in the study area influence the nutrient dynamics in the study area.