

NITROGEN FIXATION IN THE MEDITERRANEAN SEA

**Valeria IBELLO¹, Carolina CANTONI¹, Stefano COZZI¹, Giuseppe CIVITARESE¹,
Maurizio RIBERA d'ALCALA^{'2}**

¹*CNR – Istituto di Scienze Marine, Sede di Trieste. Viale Romolo Gessi 2, 34123 Trieste. ITALIA.*

²*Stazione Zoologica A. Dohrn, Laboratorio di Oceanografia Biologica, Naples, Italy*

The Mediterranean Sea is an oligotrophic basin characterized by low nutrient levels and unusually high NO₃/PO₄ molar ratios in the deeper layers, that reach the maximum (N/P = 28) in the Eastern Mediterranean.

An external nitrogen source needs to be claimed in order to explain the nitrogen excess.

Pantoja et al. (2002) found that the ¹⁵N/¹⁴N natural abundance in particulate and in dissolved inorganic nitrogen display low values, suggesting an important role of a “light” nitrogen source.

Two hypotheses can be invoked: (i) nitrogen compounds from atmospheric deposition and/or (ii) atmospheric molecular nitrogen throughout nitrogen fixation .

During TRANSMED oceanographic cruise carried out in the framework of Italian project VECTOR (June 2007), N₂ fixation experiments have been carried out all over the Mediterranean Sea and outside the Gibraltar Strait. Surprisingly, very low rates (< 0.10 nmol N₂ * l⁻¹ * d⁻¹) have been observed in different areas of the basin, while higher values have been observed in Atlantic Ocean according with literature data.

These preliminary results suggest a major role for nitrogen atmospheric deposition in shaping the NO₃/PO₄ anomaly of the basin.

Pantoja, S., D. J. Repeta, J. P. Sachs, and D. M. Sigman (2002). Stable isotope constraints on the nitrogen cycle of the Mediterranean Sea water column, *Deep Sea Res., Part I*, 4, 1609– 1621.