

Phytoplankton and irradiance in the photic zone of the Eolian Archipelago waters

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ABSTRACT

The relationships between phytoplankton biomass and species composition and the thermohaline features and irradiance vertical distribution in the photic zone of the waters surrounding the Eolian Archipelago have been analyzed.

The thermohaline features have evidenced the different water masses (NAW, MAW or TSW, TIW) and the changes in their distribution among the basins.

Associated to TSW, phytoplankton densities up to about 100000 cells/dm³ and the typical coenoses of the Tyrrhenian Sea in summertime, dominated by dinoflagellates and other phytoflagellates, have been found. In the subsurface layer (25-50 m) of the Gioia Basin a higher biomass content with a diatom-dominated coenoses has been detected in the probably nutrient rich waters of levantine origin upwelled through the Messina Strait.

Underwater irradiance attenuation is mainly determined by phytoplankton biomass and the euphotic depth changes, in the different areas, accordingly to biomass concentration. A deep biomass maximum occurs everywhere, below the euphotic zone, at different depths, laying in any case at the constant value of about 0.2 % of the surface irradiance, which of course is the same in the sampling area. This maximum is probably determined by picophytoplanktonic organisms adapted to low irradiance.