FUNCTIONAL TRAITS OF PHYTOPLANKTON COMMUNITY IN RELATION TO INORGANIC NUTRIENTS IN FUSARO LAGOON (CAMPANIA REGION, ITALY)

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Phytoplankton play key roles in marine ecosystems, driving biogeochemical cycles through their uptake of nutrients and carbon sequestration (Falkowski et al. 1998; Worden et al. 2015), or producing the primary organic matter that supports marine food-webs (Legendre, 1990). This study focuses on evaluating the phytoplankton functional traits in relation to inorganic nutrient concentrations in the Fusaro Lagoon (Campania Region, Italy). Surface water samples were collected every three hours over three five-day cycles in a fixed station in the Fusaro Lagoon between December 2023 and April 2024. High-pressure liquid chromatography (HPLC) was used to identify the pigmentary spectra composition and the related chemofunctional diversity. The concentration of total phytoplankton biomass (total Chlorophyll a) and the relative contribution of size classes micro- (>20 μm), nano- (2–20 μm), and picophytoplankton (<2 μm) was determined using spectrofluorimetric techniques. For the determination of dissolved N-NO3 and P-PO4, an EasyChem Plus autoanalyzer (Systea) was used. Our findings revealed higher concentrations of chlorophyll-a in April, when values were up to five times more than in December (2.65±0.28 μg/L vs. 0.53±0.11 μg/L), and a higher pigments diversity in February thanks to the presence of neoxanthin, MgDVP, prasinoxanthin, zeaxanthin, lutein, 19'-hexanoyloxyfucoxanthin, and chlorophyll b suggested a higher chemotaxonomically diversity. N-NO3 exhibited strong variations, closely linked to tidal phases, while P-PO4 concentrations remained consistently near 0.4 μmol/L. The size class micro-phytoplankton showed a strong correlation with N-NO3. The study of variability on a short time scale allows us to better understand the effects of the variation in concentrations of dissolved inorganic nutrients on the structure of phytoplankton communities, and on their functional traits, especially in dynamic environments such as the Fusaro Lagoon.