

O32.3**Environmental drivers of phytoplankton in a coastal lagoon: exploring the interface between anthropic pressures and ocean processes**

Maria J. Lima¹, Ana B. Barbosa¹, Alexandra Cravo¹, Cátia Correia¹, André Matos¹, Carla S. Freitas², Sandra Caetano³, José Jacob¹

¹Centro de Investigação Marinha e Ambiental (CIMA) - Universidade do Algarve, Portugal. ²Centro de Investigação Marinha e Ambiental (CIMA), Portugal. ³Universidade do Algarve, Portugal

Abstract

Water quality deterioration associated with sewage discharges is of great concern, in particular at high-risk areas such as coastal lagoons. These systems are characterized by shifts in phytoplankton communities that can be exacerbated by increasing eutrophication conditions, and potentially lead to harmful algal bloom development. This study aimed to assess the phytoplankton dynamics in Ria Formosa coastal lagoon at an area influenced by treated wastewater discharges and adjacent coastal waters, and identify underlying environmental determinants. Water samples for analysis of water quality key determinants, and phytoplankton abundance and composition were collected monthly along a gradient of dispersal from the sewage discharge point (up to ca. 2 km), during a 2-year period (September 2018-September 2020). Generalized additive models were used to explore the functional relationships between phytoplankton functional groups and potential environmental predictors. Overall, salinity increased with distance from the discharge point, while temperature, nutrients, suspended solids, chlorophyll-a, cyanobacteria, euglenophytes and planktonic diatoms declined, suggesting an influence of the sewage discharge up to 1500 m from the source. Phytoplankton included several potentially toxigenic taxa, and were dominated by cryptophytes and planktonic diatoms, that usually showed spring-summer maxima. Maximum phytoplankton biomass, dominated by diatoms, was detected during July 2019, down to 750 m from the discharge point, associated with extreme minimum of silicate and maxima of pH and dissolved oxygen. For the furthest stations, a higher influence of coastal processes was detected. For these stations, the impact of upwelling events will be specifically explored.

Keywords

phytoplankton variability, wastewater impacts, ocean interface, coastal lagoon