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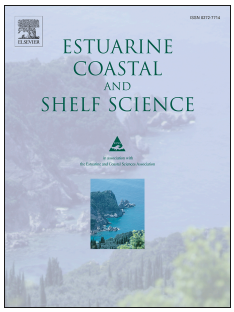

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Phytoplankton community dynamics in an intermittently open hypereutrophic coastal lagoon in Southern Portugal

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Abstract:

Phytoplankton community' dynamics were studied in Salgados coastal lagoon in order to evaluate the effects of excessive organic loads and also physical stress caused by the irregular opening of the lagoon. Salgados is a hypereutrophic intermittently open coastal lagoon, which received freshwater inputs from small rivers and from a wastewater treatment plant.

Cyanophyceae dominated the phytoplankton communities most of the time; Bacillariophyceae became the main taxonomic group in winter when the lagoon was closed; Chlorophyceae was the major class in early summer; pico-nano flagellate algae accounted for a high percentage of total phytoplankton during spring. Potentially harmful taxa were observed during most of the sampling periods, forming blooms and accounting for a considerable percentage of total phytoplankton abundance. A strong differentiation among dry and wet seasons could be noticed. The dry season was dominated by *Microsystis aeruginosa*, *Rhodomonas* sp., pico-nano flagellate algae, *Cyclotella* spp. and *Planktothrix* sp., while the wet season, although still with the presence of *Microsystis aeruginosa*, was dominated by *Dolichospermum spiroides*. The best environmental variables explaining stations patterns and based on phytoplankton taxa were days of isolation, pH, and salinity. Temperature, cumulative rain and total phosphorus were also related with species and stations patterns. The high nutrient load in Salgados lagoon promoted the development and persistence of harmful algae blooms. Proper management of coastal lagoons involves not only the control of direct discharges of nutrients, but also of other factors, including water level and communication with the sea.

Keywords: Phytoplankton communities; Salgados coastal lagoon; eutrophication; hypereutrophic water bodies, intermittently closed and open lakes and lagoons (ICOLLs)