

Water Pollution by Surfactants: Fluctuations Due to Tourism Exploitation in a Lagoon Ecosystem

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ABSTRACT

This paper describes recent levels of surfactants measured in a coastal lagoon ecosystem highly stressed by human activities: the Orbetello lagoon (Southern Tuscany, Italy, Ramsar Site IT008). Significance of difference among concentrations measured before and after summertime are explored in order to evaluate effects related to tourism exploitation. Among surfactants, methylene blue active anionic substances (MBAS) are selected as tracers for untreated discharges originated by domestic and urban activities. Water samplings were performed in 2011 following a randomly replicated nested logic model ($n = 144$). MBAS mean level of 0.070 mg.L^{-1} ($<0.001 - 0.259 \text{ mg.L}^{-1}$) and 0.530 mg.L^{-1} (-1) are respectively recorded in June and October evidencing a significant increase after the touristic season. Possible MBAS concentration phenomena could be induced by different evaporation rates among sampling stations and between winter and summer seasons and were evaluated, in this study, using water salinity as possible factor affecting samples segregations. Results evidence that differences of MBAS levels related to evaporation rates are trascurabile if compared to the variability induced by the presence of not-collected wastewater hot-spot pollution sources located closed around the urban settlement and along sandbars. Measured levels of surfactants could act negatively on living organisms both animals and plants contributing to affect Orbetello lagoon biodiversity. In this ecosystem, after the complete reorganization of urban wastewater treatment plants occurred in 2008, further management actions should be focalized on reducing untreated sources of MBAS.

KEYWORDS

MBAS; Tyrrhenian Sea; Orbetello Lagoon; Pollution; Turism Exploitation

Cite this paper

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