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Bioremediation and monitoring of seawater for the sustainable management of hydrocarbon pollution in a Tunisian Mediterranean tourist port

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This study was carried out in the framework of the project MAPMED, a multidisciplinary project aimed at improving the environmental sustainability of tourist ports in the Mediterranean Sea with regard to hydrocarbon pollution. Specifically it was directed to: 1) identify at lab-scale the limiting factors to hydrocarbon degradation by autochthonous bacterial communities in surface waters, 2) demonstrate at field scale the most efficient remediation technology integrating the biological and mechanical methodologies for oil removal. The main limiting factors to hydrocarbon degradation by bacterial communities were analyzed: Temperature, oxygen, nitrogen and phosphorous levels. Microbiological parameters (total counts of unicellular organisms, viable titles of heterotrophs and diesel degraders, degradation activity of diesel in microcosm tests) as well as the total petroleum hydrocarbons were monitored to define the microbial dynamics during treatments. Cork was selected as sorbent material for mechanical oil removal thanks to its eco-friendly properties as well as the wide distribution of the raw material, derived from oak trees, over the Mediterranean basin. The retention of bacterial biomass on the sorbent material and its release into the seawater were also evaluated.

Biography

Nicola Frigau has a Master Degree in Marine Biology and Ecology at the University of Cagliari with an experimental work on the study of microbial communities in the (bio) remediation of hydrocarbons in seawater. Since 2014, he is working as a Junior Researcher at the Department of Biomedical Sciences at the University of Cagliari. His research activity focuses on microbial ecology in marine environments as well as hydrocarbon-degrading bacteria and their exploitation in hydrocarbon bioremediation.

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