Study of microbial communities and environmental parameters in three hydrocarbon-contaminated fishing harbors (Kerkennah Islands, Tunisia)

Meriam Cheffi [1,3]*, Andrea Franzetti[1], Jean-Jacques Godon[2], Mohamed Chamkha[3],

[1]Department of Earth and Environmental Sciences -DISAT, University of Milano-Bicocca, Piazza della Scienza 1 -, 20126 Milano, Italy
[2]INRAE, Univ Montpellier, LBE, Narbonne, France
[3]Laboratory of Environmental Bioprocesses LMI COSYS-Med, Centre of Biotechnology of Sfax, University of Sfax, PO Box 1177, 3018 Sfax, Tunisia

[*]E-mail: meriam.cheffi@unimib.it
Phone number: +393333888987

Background and aims: The pollution of marine ecosystems is one of the major environmental problems due to its impact on the biosphere and human health. Although the oil industry plays a strategic role in the economies of countries, they exhibit serious problems associated with spillage. Intense industrial activity in the seas, such as oil drilling, can damage the environment enormously. In this context, the main objectives of this study are to assess, for the first time, the organic/inorganic pollution in surface seawater of Kerkennah Islands harbors, and to explore the potential of next generation marine microbiome monitoring to achieve the planning coastal managing strategies worldwide.

Methods: Surface seawater, collected from three fishing harbors during different seasons of the years 2015, 2016 and 2017, was assessed for physico-chemical and molecular analysis. This latter was used to study the microbial communities' composition and abundance.

Results: Results showed that seawater was mainly polluted by hydrocarbons and some heavy metals. SSCP analysis indicated the presence of *Bacteria*, *Archaea* and *Eucarya*, with dominance of the bacterial domain. Illumina Miseq analysis revealed that the majority of the sequences were affiliated with *Bacteria* whereas *Archaea* were detected at low relative abundance. The bacterial community, dominated by *Proteobacteria*, *Bacteroidetes, Planctomycetes, Cyanobacteria*, *Firmicutes*, *Actinobacteria* and *Chloroflexi* phyla, are known to be involved in a variety of biodegradation/biotransformation processes including hydrocarbons degradation and heavy metals resistance.

Conclusions: The indigenous population, with interesting biodegradation capacities, could be potential candidates for the *in situ* bioremediation of the contaminated seawater.