# **Trace element kinetics in caged *Mytilus galloprovincialis***

## Richir Jonathan1,2\*, Lepoint Gilles1, Donnay Annick1,3 and Gobert Sylvie1

1 Laboratory of Oceanology, University of Liege, Allée de la Chimie Bât. B6c, Sart-Tilman, B-4000 Liège, Belgium

2 Institute of Marine Sciences, School of Biological Sciences, University of Portsmouth, Ferry Road, Portsmouth, PO4 9LY, UK

3 STARESO SAS, Pointe Revellata, BP 33, F-20260 Calvi, France

\* Corresponding author. E-mail: jonathan.richir@ulg.ac.be

Trace elements (TEs) remain contaminants of concern because of their persistence, ability to concentrate in organisms and toxicity. The Mediterranean mussel *Mytilus galloprovincialis* Lamarck, 1819 is a relevant bioindicator of TE coastal contamination. However, little research has studied the combined influence of environmental condition changes and physiological processes on their kinetics in that species. Caged *M. galloprovincialis* were thus immerged in 2 contrasted pristine Corsican (France) coastal environments, the semi-enclosed Diane salty pond and the open Calvi Bay, from February to June 2011. Mussels were regularly sampled to study the kinetics of 19 TEs in their flesh; dissolved and particulate TEs were also monitored. The primary production and the water physico-chemical variables were measured, and meteorological data were purchased from Météo-France. TE kinetics in mussels differed between sites. Mussel spawning, a temperature and saline-induced physiological process that occurred about 10 days later in the Diane pond, was followed by a short time increase of TE levels in the mussel flesh. Mussel contamination also evolved according to changes of their respective environmental TE levels. Raining events temporary led, in the Diane pond, to the water enrichment with TEs, nutrients and detrital material, to peaks of primary production and to the increase of TE concentrations in the mussel flesh. This step by step evolution of TE levels in the environment and mussels was afterwards followed by a rapid return to initial conditions. In the open Calvi Bay, these fast and balanced kinetics were not so obvious, because of the rapid dilution of environmental constrain effects in the Bay. Mussels are often used as bioindicator in estuaries and coastal enclosed meadows with rapidly changing environmental conditions. In such conditions, the influence of the environment on TE kinetics in mussels must be considered, in addition to physiological processes, when monitoring the TE coastal contamination.