# **Ecology of 20 trace elements in *Mytilus galloprovincialis***

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Trace elements (TEs) are considered as non-degradable pollutants. This persistent character can alter their natural biogeochemical balance in contaminated environments. TEs are further toxic for aquatic organisms from threshold levels and are thus likely to cause multiple damages to the population, the community and the ecosystem levels. For these reasons, their environmental occurrence has to be accurately monitored. The main interest of the use of quantitative sentinel organisms to this end, or bioindicator species, is their capacity to give information on the bioavailability of environmental contaminants. Mussels from the genus *Mytilus* are particularly well suited organisms for the monitoring of the coastal contamination. Native wild and cultured *Mytilus galloprovincialis* Lamarck, 1819 have been widely used since around 40 years to this purpose along coasts of the eastern Atlantic and the Mediterranean. But the accurate use of a bioindicator relies on the detailed knowledge of its ecophysiology and the influence of environmental variables on the bioaccumulation processes. In the framework of the STARECAPMED project, the ecology of 20 TEs in *M. galloprovincialis* is therefore investigated. The mussel morphometry and biology firstly define the TE accumulation processes. Accumulated TE are internally regulated and redistributed between body compartments; these internal processes notably depend on the essential or non-essential character of TEs. As filter feeder, mussels accumulate soluble and suspended TEs whose environmental levels are determined by the geomorphology, the physico-chemistry and the hydrology of monitored coastal meadows. All these factors are acting together to modulate the TE accumulation processes in mussels. TE bioaccumulated levels further balance quickly when any physiological or environmental changes occur in order to reach a new steady-state with environmental TE loads. The ecology of TEs in *M. galloprovincialis* is thus complex and very dynamic; these considerations must be taken into account when monitoring the chemical contamination of coastal meadows.