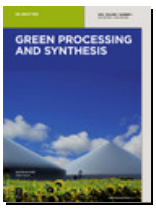

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Can mitochondrial malondialdehyde content be a useful tool to evaluate sea lamprey juveniles' capacity to seawater acclimatization?

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Abstract

The sea lamprey is an anadromous species that migrates twice during its life cycle between freshwater and seawater. Microphagous larvae generally spend 4–5 years burrowed in the substrate of rivers and streams before undergoing metamorphosis that ends with the beginning of the juvenile trophic migration. Once metamorphosis is complete, sea lamprey juvenile downstream migrants are fully tolerant to seawater salinity. Pollution resulting from industrial effluents may disturb the seawater acclimatization causing oxidative damage, and ultimately may lead to a decrease of sea lamprey population. The aim of this study was to compare salt acclimation of sea lamprey juveniles captured in river basins with different levels of aquatic pollution, using mitochondrial glutathione (GSH) and malondialdehyde (MDA) of gills and liver as markers of physiological stress and cell damage. The results showed that juveniles from the Lima basin exhibited the highest levels of mitochondrial MDA in gills, even though significant changes in the stress markers of mitochondrial gills of all animals subject to salt acclimation were not detected. In addition, an increase in the oxidative damage of hepatic mitochondria of macrophthalmia from the Vouga basin suggests the occurrence of metabolic failures with the potential to disturb the capacity to adaptation to the marine environment.

Keywords: cell damage; oxidative stress; Petromyzon marinus; seawater acclimation