Geophysical Research Abstracts
Vol. 19, EGU2017-14041, 2017
EGU General Assembly 2017
© Author(s) 2017. CC Attribution 3.0 License.

Assess the environmental health status of macrophyte ecosystems using an oxidative stress biomarker. Case studies: The Gulf of Aqaba and the Lagoon of Venice

Mohammad Wahsha (1), Abdul-Salam Juhmani (2), Alessandro Buosi (2), Andrea Sfriso (2), and Adriano Sfriso (2)

(1) Marine Science Station, The University of Jordan, Aqaba branch, Jordan (m.wahsha@ju.edu.jo), (2) Ca' Foscari University of Venice, Department of Environmental Sciences Informatics and Statistics, Italy

Macrophytes play a fundamental role in structuring communities in aquatic environments. They contribute to maintaining the ecosystem services. Unfortunately, nowadays, they are threatened by different sources of pollution. The release of such potentially toxic elements (PTEs) to the environment may influence negatively the ecosystem health, which often limits and sometimes disqualifies the ecosystem biodiversity. Indeed, the increasing concentration and distribution of PTEs in the marine ecosystem by mismanagement of industrial activities, overuse of agrochemicals, and waste disposal are causing worldwide concern.

The aim of this work is to describe the developing of an innovative early warning tool, based on the implementation of the lipid peroxidation oxidative stress biomarker for the assessment and monitoring of ecological status in response to PTEs in different marine environments.

Six sites were selected along the Jordanian coastline of the Gulf of Aqaba and the lagoon of Venice in Italy according to different morphological, ecological conditions and anthropogenic impact.

Our results indicated that the effect of PTEs causes oxidative stress to macrophytes; in particular: *Ulva fasciata* and *Ulva lactuca* collected from the lagoon of Venice and Gulf of Aqaba respectively. The oxidative stress by PTEs alters the biochemical processes, as it stimulates the generation of reactive oxygen species (ROS) and accordingly the oxidative degradation of lipids (LPO). The by-products of LPO, the organic compound malondialdehyde (MDA) is significantly correlated ($p<0.05$) to the levels of PTEs in the environment.

We can conclude that despite the numerous analytical methods available, the determination of isolated substances by traditional chemo- physical analysis has a limited environmental application. Thus, the implementation of MDA assay as an alternative diagnostic biomarker tool could be more effectively to recognize changes in the environment at an early stage.

Keywords: *Gulf of Aqaba, lagoon of Venice, macrophytes, lipid peroxidation*.