Assessment of Metallothionein as a Biomarker of Heavy Metal (Hg, Cd, Pb and Cu) in Oyster *Crassostrea gigas* in Imam Khomeini Port

Azimi, Ali[1]; Safahieh, Alireza[2*]; Dadollahi Sohrab, Ali[3];
Zolgharnein, Hossein[4]; Saffar, Behnaz[5]; Savari, Ahmad[6]

1- Iranian National Institute for Oceanography (INIO), Tehran, Iran. Email: azimi.1985@yahoo.com
2- Department of Marine Biology, Faculty of Marine Science and Oceanography, Khorramshahr University of Marine Science and Technology, Khorramshahr, Iran. Email: safahieh@hotmail.com
3- Department of Environment, Faculty of Natural Resources, Khorramshahr University of Marine Science and Technology. Khorramshahr, Iran. Email: p_dadolahi@yahoo.com
4- Department of Marine Biology, Faculty of Marine Science and Oceanography, Khorramshahr University of Marine Science and Technology, Khorramshahr, Iran. Email: zolgharnine@yahoo.com
5- Department of Genetic, Faculty of Basic Sciences, Shahrekord University, Shahrekord, Iran. Email: saffar_b@sci.sku.ac.ir
6- Department of Marine Biology, Faculty of Marine Science and Oceanography, Khorramshahr University of Marine Science and Technology, Khorramshahr, Iran. Email: savari53@yahoo.com

Received Date: January 09, 2011 **Corresponding Author* *Accepted Date: June 20, 2011*

Abstract

The present study aimed to validate the potential use of MTs as a biomarker of Hg, Cd, Pb and Cu exposure in soft tissue of oysters *Crassostrea gigas* in Imam Khomeini port. For this purpose, oysters from the same size were sampled on March 2010 from 5 different locations including harbors of Petroshimi, Doc Sorsoreh, 15, 28 and 33 in the Imam Khomeini port. The samples were freeze dried and acid digested in order to determine their heavy metal content. MT contents of oysters were extracted first and then after precipitation by ethanol/chloroform, they were measured by spectrophotometry method. Results indicated that the content of Hg, Cd, Pb and Cu in the oysters' soft tissue were 3.12±2.77, 10.34±3.98, 7.1±3.30 and 440.57±66.17 µg/g of dry weight respectively. MT concentrations in the oysters of different stations ranged from 96.5±5.53 to 185.75±7.34 µg/g of wet weight. the Highest level of Hg, Pb and Cu were measured in harbor of Petroshimi while the highest level of Cd was measured in harbor no 15. The oysters from harbor no 28 contained the lowest level of all measured metals. Also the lowest amount of MT synthesis observed in the oysters from harbor no 28. The highest level of MT was measured in oysters from harbor no 15. Among the studied metals, Cd showed a strong and direct correlation with MT level in the oysters (P<0/01). Such correlation was not found for other metals (P >0/05). It is concluded that MT is an appropriate biomarker for Cd contamination in oysters from Imam Khomeini port.

Keywords*: Metallothionein, Biomarker, Heavy metals, Oyster Crassostrea gigas, Imam Khomeini port, Persian Gulf.*