

Investigation of some heavy metals contaminations in the Asalouyeh and its effect on fish muscle (*Scomberomorus guttatus* and *Brachirus orientalis*) in GIS

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Abstract

One of the pollutants produced by gas and petrochemical industries in Asaluyeh region is heavy metals which, by entering of these industries into the Persian Gulf, has caused water and aquatic pollution. Therefore, in the present study were investigated the concentration of non-carcinogenic hazard quotient index (NHQI) of heavy metals (Fe, Cr, Pb, Cu, Zn, Cd, Se, Ni) in Persian Gulf waters and its impact on *Scomberomorus guttatus* and *Brachirus orientalis*. A total of 42 water samples and 84 fish species samples were collected from 14 points (three replicates each) and the concentrations of metal elements in fish water and muscle were measured. After normalizing the data, heavy metal pollution index (HPI) was used to determine the amount of heavy metal contamination in fish and water. Finally, kriging method in GIS environment was used to determine the spatial distribution of heavy metals in fish and water. The results of analysis in water samples showed that the maximum values of Cd, Cu, Ni, Pb, Zn, Pb in the samples were 4.8, 10, 9.8, 5.2, 9.4, 6.7 mg/l respectively. Given these values, it is clear that near the power plant all elements exceed international standards, indicating high water pollution in the area. The results also showed that the contamination was higher in *Brachirus orientalis* than in the *Scomberomorus guttatus* where the two fishes lived where the *Scomberomorus guttatus* live near the surface of the water, whereas the *Brachirus orientalis* were live in deeper water. Based on the results of this study, it can be expected that the long-term risk of contamination with heavy metals will continue. As the risk of contamination on the marine waters of the area has a great impact, which leads to their poisoning and enters the food cycle of the people of the region.

Keywords: South Pars Power Plant, Heavy Metals, Water Quality, *Brachirus orientalis*, *Scomberomorus guttatus*, Heavy Metal Pollution Index (HPI), GIS.