

Determination of metals in tissues of mallard (*Anas platyrhynchos*) and risk assessment of food consumption in the southeastern Caspian Sea

Mohammad Hosein Sinka
Karimi^{1*}

Ali Reza Pourkhabbaz¹

Mehdi Hassanpour²

Seyed Mahmoud Ghasempoui³

1. Department of Environment,
Natural Resource and
Environment Faculty, Birjand
University, Southern Khorasan,
Birjand, Iran

2. Department of Environment,
Provincial Directorate of
Environment Protection,
Golestan, Iran

3. Department of Environmental
Science, Natural Resource and
Marine Science Faculty, Tarbiat
Modares University, Nour, Iran

*Corresponding author

MH_Sinkakarimi@yahoo.com

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Abstract

Heavy metals due to accumulation, bioaccumulation and high toxicity are main contribution of concern in aquatic ecosystems. Wetland birds because of their position in the top of food chain can be an indicator of level of metals in their environment. In this investigation 30 mallard (15 male and 15 female) were collected from Southeast of Caspian Sea. The concentrations of lead (Pb), cadmium (Cd), chromium (Cr), zinc (Zn) and iron (Fe) in the liver, kidney and pectoral muscle of mallards were determined by atomic absorption Spectrophotometer method. Liver and kidney showed the highest bioaccumulation of metals. The distribution pattern of Pb, Cd, and Cr respectively was kidney > liver > muscle, while Zn and Fe respectively was liver > kidney > muscle in mallard. Mean concentrations in the liver, muscle and kidney follows the sequence: Fe > Zn > Pb > Cd > Cr; Fe > Zn > Pb > Cr > Cd, respectively. Females possessed significantly higher Fe in the liver than males ($p < 0.05$). Estimated daily intake (EDI) and estimated weekly intake (EWI) due to consumption of mallards indicated safe levels for the human consumption. THQ for all metals were less than one. In general, human activities in surrounding areas of this region and Influence of wastewaters can be main source of metal pollution in the studied area. The results of this investigation can be used for monitoring of southeastern Caspian Sea.

Keywords: Mallard, Caspian Sea, Metals, Health risk, Birds.