

Original Article

Some trace elements in the water, sediments and muscles of three fish species along the Tigris River in Misan, southern Iraq

Majida Sabah Al-Enazi^{1*}, Israa Ibrahim Lazim²

¹Department of Biology, College of Education for Pure Science, University of Basrah, Basrah, Iraq.

²Department of Biology, College of Science, University of Misan, Misan, Iraq.

Abstract: This study aimed to study the concentrations of some trace elements viz. Pb, Ni, Cd, Co, and Fe in the water, sediments and muscle of three fishes of *Liza abu*, *Mesopotamichthys sharpeyi* and *Carasobarbus luteus* in the Tigris River by selecting six stations distributed along the Misan Governorate, southern Iraq. The study was conducted during two seasons, winter and summer. The concentrations of the studied trace elements in water followed the following order: Fe > Ni > Cd > Co > Pb. Fe had the highest concentration in the water (28.748), while the lowest one was Pb (0.0523). The results also recorded the trace elements in order of Fe > Ni > Pb > Cd > Co. The highest concentration of Fe in the sediments was 9690.39, and the lowest was cobalt (8.612). The bioconcentration factor (BCF) values in the studied fish species were much higher than the biosedimentation factor (BSF). We conclude that the concentrations of trace elements in the sediments were more than in the waters of the Tigris River, as a storage place of pollutants in the aquatic environments.

Article history:

Received 11 August 2022

Accepted 14 October 2022

Available online 25 February 2023

Keywords:

Trace elements

Pollution

Accumulation

Bioconcentration factor

Introduction

Several studies have been conducted on the pollution of rivers with trace elements, and the over-contamination of these elements has become a concern for the health of the aquatic ecosystem (Abdullah et al., 2020; Lazim et al., 2022). Because the trace elements are characterized by their high stability and remain for a long time, and are not affected by other environmental factors. It depends on its ability to form multiple complex compounds. Therefore, it is difficult to remove them (Agbozu et al., 2007; AL-Enazi et al., 2020). Thus, this pollution causes great environmental stress to aquatic organisms (Kapahi and Sachdeva, 2019).

Trace element pollution in aquatic environments has been increasing worldwide in recent years. This is because of human activities, which are the primary source of pollution in the environment, such as the dumping of industrial waste and chemical fertilizers, which play a significant role in the dissemination of

trace elements in the aquatic environment (Huang et al., 2018; Algül and Beyhan, 2020). Most of these elements reach the ecosystem by dumping directly or indirectly, such as industrial waste dumped into river waters directly without treatment (Mulk et al., 2017; AL-Enazi et al., 2022). Or by dumping agricultural residues due to pesticides, chemical fertilizers, and wastewater (Al-Zubaidi, 2012; Salman, 2015; Khamar et al., 2018). These minerals are considered among surface water's most critical environmental pollutants because of their accumulation within these ecosystems and their high reliability. They are characterized by the inability to decompose by microorganisms and other life processes. Therefore, they constitute a significant threat to human health (Alkam and Jadan, 2010; Al-Naggar et al., 2018).

High levels of elements in water often lead to elevated concentrations in sediments that are storage places for pollutants (Juned et al., 2018). The elements are released from the sediments directly

*Correspondence: Majida Sabah Al-Enazi
E-mail: majida.abdalsaid@uobasrah.edu.iq

DOI: <https://doi.org/10.22034/ijab.v11i1.1718>

DOR: <https://dori.net/dor/20.1001.1.23830956.2023.11.1.2.2>