

Republic of Iraq
Ministry of Higher Education
and Scientific Research
Muthanna University
College of Science



**Assessment of some heavy metal in water and sediments of
Euphrates river at Al-Samawa city and measurement of their
Bioaccumulation in *Barbus luteus* (Heckel) Fish**

A Thesis

*Submitted to the Department of Biology, College of Science, Muthanna
University, in Partial Fulfillment of the Requirements for the Degree of
Master of Science in Biology /zoology*

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2015 A.D

1436 A.H

Abstract

This study is undertaken to estimate (Cu), (Cd), (Zn) and (Pb) concentrations in water and fish tissues and the level of expression gene Metallothionein in *Barbus luteus* in Euphrates river.

Two sampling stations are selected to conduct the study in Euphrates River in Sammawa city (Al-Sibil and Al-Atshan). The samples are taken from the study stations during two seasons (spring and summer).

The study results show that the mean concentrations of heavy metals (lead, cadmium, zinc and copper) in water were 0.38 ppm, 0.04 ppm and 0.84 ppm and 0.19 ppm respectively, whereas, the mean concentrations of same metals in sediments were 1.3 ppm, 0.2 ppm, 2.5 ppm and 0.3 ppm respectively. The study results show that the mean concentrations of heavy metals in sediment are higher than water.

In fish muscle tissues, the mean concentrations of (lead, cadmium, zinc and copper) were 0.3 ppm, 0.03 ppm, 2.4 ppm and 0.3 ppm, respectively.

However, in liver tissue the concentrations were 0.5 ppm, 0.04 ppm, 3.2 ppm and 1.2 ppm, respectively, and in gills were 0.91 ppm, 0.05 ppm, 3.5 ppm and 1.3 ppm respectively.

The results of the present study show that the metal concentrations in tissues (gills, liver and muscles) are several times higher than water and lower than sediments. The results of RT-PCR show that the metallothionein

was highly expressed in liver which is detected in two stations compared with control and monitoring the fish response to heavy metal pollution in Sammawa city. It was concluded that the Sibil station more polluted than the Atshan station.