



**TOXIC HEAVY METAL ACCUMULATION  
AMONG DIFFERENT ORGANS OF CULTURED  
ROHU AND CATLA ALONG WITH  
EVALUATION OF ENZYMATIC ACTIVITIES IN  
EXAMINED ORGANS**

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**A thesis submitted in the partial fulfillment of the requirements for the degree of  
Master of Science in Fisheries Resource Management**

**Department of Fisheries Resource Management  
Faculty of Fisheries  
Chattogram Veterinary and Animal Sciences University  
Chattogram-4225, Bangladesh**

**December 2019**

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## LIST OF ABBREVIATIONS

As	:	Arsenic
AAS	:	Atomic Absorption Spectrometer
Cr	:	Chromium
DoF	:	Department of Fisheries
<i>et al.</i>	:	<i>et alia(L)</i> , and others
FAO	:	Food and Agriculture Organization
FY	:	Fiscal Year
GDP	:	Gross Domestic Product
MT	:	Metric Ton
Pb	:	Lead
PPM	:	Parts Per Million
WHO	:	World Health Organization
%	:	Percentage
ATP	:	Adenosine tri phosphate
ALP	:	Alkaline phosphatase
µg/L	:	Micro gram per litter
mM	:	Milli molar

## **ABSTRACT**

The present study was carried out to determine the concentration of heavy metals and to evaluate whether there are any serious toxic effects of the widely exposed heavy metals namely arsenic (As), lead (Pb) and chromium (Cr) in different tissues of two commercially important cultured fish rohu and catla. The obtained results stated the highest concentrations of all heavy metals (except arsenic) were recorded in rohu fish with not significantly differ with the other investigated fish species catla. Organ wise heavy metal concentrations in rohu fish showed that Pb concentrations were higher in all organs such as gill (0.021 ppm), liver (0.021 ppm), kidney (0.028 ppm), muscle (0.008 ppm) compares other two heavy metals. As was highly exposed in kidney, Cr exposed highly in muscle. In rohu fish all organs contained lower amount of Cr except muscle than other three. In catla fish, similar conditions were appeared where Pb concentration was the highest and Cr concentration was lowest. Among all the three heavy metals, the accumulation trend of As was found highest in gills of catla but Pb and Cr accumulated in high concentration in kidney of catla. Though the study suggest that estimated concentrations of all heavy metals were lower than the recommended range except in catla where its mean accumulation was 0.013 ppm which was higher than recommended value of 0.01 ppm. Enzymatic activities like ATPase and ALP were recorded highest in kidney tissue and the lowest in muscle in case of both fish species. Heavy metals concentrations in both fish species reflected that the fish obtained from the source were safe for human consumption. However, safety issues must be followed to avoid more exposure to pollutant.

**Key words:** Heavy metals, Rohu, Catla, Gill, Liver, Kidney, Muscle, ATPase, ALP activity