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

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Session: 2018-2019

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

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December 2019

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DECEMBER 2019

ACKNOWLEDGEMENTS

All praise is due to the Almighty Allah who enables the author to pursue higher education in fisheries and to submit the thesis for the degree of Master of Science (M.S.) in Fisheries Resource Management.

The author expresses her sincere gratitude and indebtedness to **Professor Dr. Goutam Buddha Das**, Vice-Chancellor, Chattogram Veterinary and Animal Sciences University and **Professor Dr. Mohammed Nurul Absar Khan**, Dean, Faculty of Fisheries, CVASU for their immense administrative support to complete her research work.

The author wishes to express her heartfelt gratitude, sincere appreciation, immense indebtedness, best regards and deep sense of respect to her reverend teacher and research supervisor **Dr. Sk Ahmad Al Nahid**, Head and Assistant Professor, Department of Fisheries Resource Management, CVASU for his unconditional love, scholastic guidance, innovative suggestions, constructive criticism and constant untiring inspiration during the entire period of the research work. In a word, it was quite impossible to complete the research work without his intensive assistance.

The author is proud to express her wholehearted sense of respect and gratefulness and sincere appreciation to her respected and honorable reverend research co-supervisor **Sk Istiaque Ahmed**, Assistant Professor, Department of Fisheries Resource Management, CVASU for his valuable suggestions and kind cooperation during the whole research period.

The author shows gratefulness to **Md. Fahad Bin Quader**, Head and Assistant Professor, Department of Applied Chemistry and Chemical Technology, CVASU for his guidance during fish samples collection, preparation and analyses.

The author would like to express her gratitude and cordial thanks to all other respected teachers of the Faculty of Fisheries, CVASU for their valuable teaching and continuous encouragement during the study period in fisheries.

The author extends her eager thanks and gratefulness to all the staffs of Depertment of Fisheries Resource Management, CVASU, Chattogram, for their support and friendly help during the study period.

The author would like to express her deepest sense of gratefulness to her beloved parents Md Fazlullah and Rayhena Akhter for their sacrifice, blessings and encouragement. She also expresses thanks to her sisters for their support and valuable prayers during research work.

Cordial cooperation, friendly collaboration, fruitful advice and guidance were received from many other persons from the beginning to the end of this research work. The author is immensely grateful to all of them and regretful for her inability for not to mention everyone by name.

The author

December, 2019

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LIST OF ABBREVIATIONS

As	:	Arsenic
AAS	:	Atomic Absorption Spectrometer
Cr	:	Chromium
DoF	:	Department of Fisheries
et al.	:	*et* alia(L), 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