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Research Article

CHANGES IN PROTEIN CONTENT IN THE FOOT OF FRESH WATER BIVALVE, *LAMELLIDENS CONSOBRUNUS* AFTER CHRONIC EXPOSURE OF MERCRY

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ABSTRACT
Protein content in the foot of fresh water bivalve, *Lamellidens consobrunus* exposed to chronic $LC_{50/10}$ conc. of mercuric chloride for a period of 24 days has been studied. After 8, 16 and 24 days of exposure the foot showed significant depletion from - 18.83%, - 27.01%, and - 43.42% over the control.

Keywords: *Protein Content, Mercury, Lamellidens cosobrunus, Foot*

INTRODUCTION
Heavy metals are recognized as a strong biotoxicants, because of their persistent nature and cumulative action to the aquaticflora and fauna (Sharma and Agrawal, 2005). Heavy metals are economic poisons used to control a wide range of animal and plant pests. The fresh water environment is becoming increasingly polluted throughout the biosphere with various heavy metals and as heavy metals are non-biodegradable, their concentration in the environment increases. These environmental pollutents bring about damage to different organs or disturb the physiological and biochemical processes within the organism. The protein content in the tissues of animals plays a role in the metabolism of animals (Palanivelu *et al.,* 2005). Morthy and Priyamvada (1982) stated that the protein content of the cell may be considered as an important tool for evaluation of physiological standards. Mercury tends to concentrate in various organisms including fish due to reduced biodegradation of its derivatives. Heavy metals mainly react with proteins and adversely alter the physiological activities hence cause risk of life in different way. Protein acts as enzyme, antibody, hormone and basic structural component of the animal. Protein is key substance to show the effect of heavy metal. Proteins respond to stress condition for better survival by altering their levels. Considering all these things, the main objectives of this research were to determine the contamination levels of heavy metals in water in aquatic organisms like *Lamellidens consobrunus.*

MATERIALS AND METHODS
The bivalve, *Lamellidens consobrunus* were acclimatized to laboratory condition for 2-3 days and healthy active bivalve of approximately medium size and weight were chosen. These bivalve were divided into two groups, such as group A and B. The bivalve of group A were maintained as control. The bivalve from group B were exposed to chronic concentration (LC 50 value of 96 hr/10) of heavy metal salt, Mercury chloride (0.132 ppm) upto 24 days. The experimental bivalves from A to B groups were dissected after 8, 16 and 24 days and foot tissues were collected. The foot tissues were dried at 80 ^{0C} in an oven until constant weight was obtained. The dried powders of these tissues of control, experimental groups of animals were used for estimation of their protein contents. Total protein was estimated by Lowry's method (Lowry *et al.,* 1951) using bovine serum albumin as standard from each powder. The average results of three repeats are presented in the table.

RESULT AND DISCUSSION
All enzymes are proteins in nature and they control subcellular functions and accelarate the rate of metablic action in the body of organism. Ramanarao and Ramamurthi (1978) studied the protein content in the tissue of *Pila globosa* after exposure to pesticide. Protein as one of the main sources of energy and it plays an important role in the maintenance of blood glucose (Jrueger *et al.,* 1968). It is the most

fundamental and abundant biochemical constituent present in the animal body and the estimation of protein is considered to be important (Ravichandran *et al.*, 1994). Mule and Lomte (1995) have reported that the protein content of an animal is an important organic constituent, which plays a major role in cellular metabolism. After the exposure of $LC_{50/10}$ conc. of mercuric chloride protein content in the foot tissuese of *Lamellidens consobrunus* was significantly affected. After 8, 16, and 24 days of exposure the foot showed constant depletion in the amount of protein from - 18.83%, - 27.01%, and - 43.42% over control.

Table A: Protein Content in Foot Tissues of *Lamellidens consobrunus*, after Chronic Exposure to Heavy Metal Salt, Mercury Chloride

Treatment	Body Tissue	The Protein Content (%) ± S.D.		
		8 Days	16 Days	24Days
(A) Conrol	F	46.2± 0.0091	45.9± 0.00157	45.5± 0.0069
(E) 0.132ppm $HgCl_2$	F	37.5± 0.0048 - 18.83•	33.5± 0.0034 - 27.01•	27.56± 0.0029 - 43.42•

F – Foot / •-Compared with respective A

Another probability is that might have occurred blocking of the protein synthesis and proteolysis on exposure to chronic period of stress condition. This is in support with studies if Srinivas Rao (1987) who noticed the reduction of total protein in the muscle of tissue *C. punctatus* after the treatment of heavy metal. According to Abel (1974) the decrease of protein may be due to alterations of membrane permeability. The depletion in the protein content was reported from the muscles of fish, *Clarias batrachus* after treatment with pesticide by the Yagana *et al.*, (1981). Joseph *et al.*, (1987) observed the effect of copper on biochemical composition of *Cyprinus carpio* and found that total protein content of the brain, liver and muscles was declined. Mukherjee and Sinha (1993) studied the effect of heavy metal toxicity on haematological and biochemical aspect in the fresh water major carps, *Labeo rohita*. Katticaran *et al.*, (1995) studied the copper induced alterations in total carbohydrate and protein level in the bivalve, *Sunetta scripta*. In present study, the protein content in foot tissue of *Lamellidens cosobrunus* was decreases increase the exposure period.

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