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***Research Article** (Open Access)*

STUDY OF DIFFERNCE OF GLYCOGEN CONTENT IN VARIOUS TISSUES OF SNAILS, *BELLAMYA BENGALENSIS* (LAMARCK) AFTER LEAD INTOXICATION

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ABSTRACT
Study was conducted to evaluate the effect of lead nitrate on glycogen content in various tissues of fresh water gastropod snail's, *Bellamya bengalensis.* The effect on snail's was studied under two groups. Group A was maintained as control, group B of snail's was exposed to chronic $LC_{50/10}$ dose of $PbNo_3$ (6.753ppm) for 21 days. Glycogen content in selected tissues hepatopancreas and gonads of *Bellamya bengalensis.*from both groups were estimated after 7, 14 and 21 days. Significant decrease in glycogen content was observed in As_2O_3 exposed snail's as compared to control.

***Keywords**: Glycogen content , Lead nitrate and Bellamya bengalensis*

INTRODUCTION

In India, the main source of lead pollution is through automobile exhaust because of the use of unleaded gasolene. In developed countries like UK, the Royal Commission (Royal Commission in Environmental Pollution IX Report ,1983).The alimentary and respiratory tracts are the main portals of entry for lead into the body. It is estimated that 150-300 µg of lead is ingested through the oral route and about 10-20 µg is inhaled via the respiratory tract daily (Goldfrank et al,1983). Concentration of toxic agents in the ecosystem has increased tremedously,specifically in terrestrial and aquatic environment.

Heavy metals are highly active contaminants of biotic material, which enters the aquatic environment through a number of routes (Bryan and Langston,1992).Heavy metals are naturally occurring inorganic elements which are present in very small amounts in the living tissues but are important for the vital processes of life (Kazi *et al*., 2009) The exact mechanism of their toxicity is still unknown but their synergistic effect is well defined (Karri, 2016). Very toxic, soluble and relatively accessible e.g. selenium, arsenic, zinc, mercury, lead, copper, cobalt, nickel etc. classified (Wood, 1974). In case of Zn deficiency and increased exposure to toxic metals such as lead (Pb), body will use Pb instead of Zn (Duruibe, 2007). In fish they results in the production of lipid radicals with lipid degradation (Plaskett, 2005). It is very common for metal concentrations in the hepatopancreas to be higher than those in other tissues because of the heavy involvement of this organ in detoxification.The freshwater mussel, Parreysiarugosa subjected to mercuric chloride revealed changes in the levels of glycogen (Ravindra Reddy, 1987). Some of the researcher studied and reported that, depletion of hepatic glycogen and other researchers reported elevation of blood glucose associated with hepatic glycogen depletion in response to mercury poisoning (Ahmed et al,1977 and Rao et al,1980; Lomte and Alam,1982). In the present study an attempt has been made to find out difference of glycogen content in various tissues of bellamya bengalensis after lead nitrate intoxication

MATERIALS AND METHODS

The snail's, *Bellamya bengalensis* were acclimatized to laboratory condition for 2-3 days and healthy active snail's of approximately medium size and weight were chosen. These snail's were divided into two groups, such as group A and B . The snail's of group A were maintained as control. The snail's from group B were exposed to chronic concentration (LC_{50} value of 96 $hr/_{10}$) of heavy metal salt, $PbNo_3$

(6.753ppm) upto 21 days. During experimentation snail's were fed on fresh water algae. The hepatopancreas and gonads of snail's from both the groups were collected after every seven days and were dried at 80^0 C in an oven till constant weight was obtained. Glycogen contents in the dried tissues were estimated by the method of Dezwann and Zandee (1972) using anthrone reagent and glucose as standard. The values of glucose obtained were converted to glycogen values by multiplying with the factor 0.927.

RESULTS

Glycogen contents in different tissues (hepatopancreas and gonads) of *Bellamya bengalensis* after exposure to $PbNo_3$ (6.753ppm) have been summarised in table and figure A and B shows , That the glycogen contents in tissues of hepatopancreas and gonads of *Bellamya bengalensis* in presence of $PbNo_3$ (6.753ppm) decreased with the increase in exposure period as compared to control.In control group of snails glycogen content in hepatopancreas and gonads is 1.1554 ± 0.0083 to1.0665 ± 0.0005 and 0.6888 ± 0.0004 to 1.0665 ± 0.respectively while in experimental gruop of snails,glycoen content is 1.1110 ± 0.0008 to 1.0443 ± 0.0008 and 0.6666 ± 0.0000 to 0.5999 ± 0.0010 respectively.the decrease of glycogen content in hepatopancreas and gonads is due to heavy metal stress.

Table 1: Glycogen Content In Selected Tissues Of Bellamya Bengalensis After Chronic Exposure To Heavy Metal Salts, $PbNO_3$

Treatment	Sr No.	Body Tissue	The Glycogen content (%) ± S.D.		
			7 Days	14 Days	21 Days
(A) Control	I	H.	**1.1554 ± 0.0083**	**1.0887± 0.0040**	**1.0665 ± 0.0005**
	ii	G.	**0.6888 ± 0.0004**	**0.6443± 0.007**	**0.6332 ± 0.0005**
(B) 6.753 ppm $PbNo_3$	I	H.	**1.1110 ± 0.0008*** - 3.842$^{\bullet}$**	**1.0665 ± 0.005*** - 2.0391$^{\bullet}$**	**1.0443 ± 0.0008*** -2.081$^{\bullet}$**
	ii	G.	**0.6666 ± 0.0000*** - 3.222$^{\bullet}$**	**0.6221 ± 0.0005^{NS} -3.445$^{\bullet}$**	**0.5999 ± 0.0010*** - 5.259$^{\bullet}$**

*H.- Hepatopancreas, G – Gonads, * -P < 0.005, ** -P < 0.01, *** -P < 0.001, • - Compared with respective A*

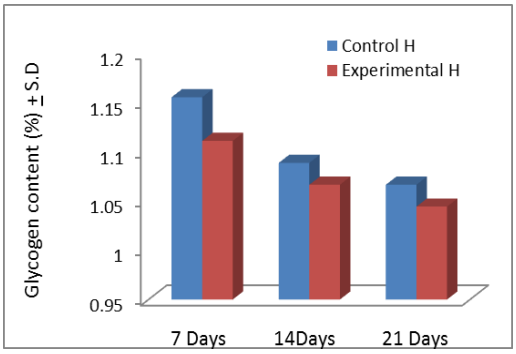

Figure-A

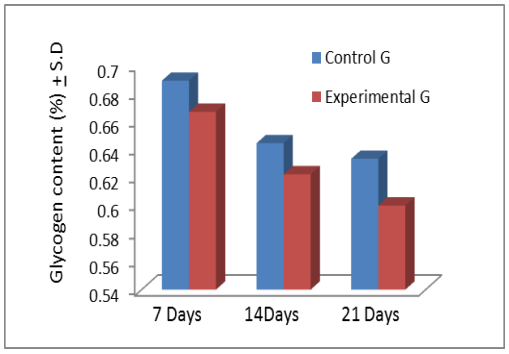

Figure-B

DISCUSSION

The change in biochemical composition of an organ due to heavy metal stress indicates the change in activity of an organism . It reflects light on the utilisation of their biochemical energy to counteract the toxic stress. Heavy metal salts affect the metabolism of the fresh water snail's, *Bellamya bengalensis*. Alterations in metabolic pocesses, following exposure to heavy metal stress have been always used as an

indicator of stress. But there is a vast difference in the pattern & metal induced physiological alterations from metal to metal & animal to animal .

Glycogen is the immediate source of energy which gets converted into glucose by glycogenolysis to overcome the stress by pollutants. In the Present study, there is a sudden depletion of glycogen content in the hepatopancreas and gonads in early exposure to $PbNo_3$ with the stress. Similar results were seen in the liver of juvenile Coho salmon and muscle glycogen profile of H. fossils, exposed to paper mill effluent (Me Leay, 1979). Glycogen (animal starch) accumulates in liver and is an important reserve. The conspicuous changes in the glycogen content of hepatopancrease and renal organ of fresh water snail, *Pila globosa* ,The decrease in glycogen content of hepatopancrease was found after acute and chronic exposure of Dithane M -45 (Asheesh and Gupta, 2014).

The effect of sublethal concentration of sumithion on some biochemical constituents of the snail, *Pila globosa* and found a decrease in glycogen content. Other researchers reported the depletion of tissue glycogen and also decrease in the glucose 6- phosphate activity (Goel and Agrawal, 1982). Other researchers observed depletion in glycogen content in digestive gland of snail, *Thiaratuberculate*when exposed to mercuric chloride (Muley and Lomte, 1992).

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