



**ORIGINAL RESEARCH PAPER**

**Zoology**

**EFFECT OF LETHAL CONCENTRATION OF CADMIUM NITRATE ON GLYCOGEN CONTENT IN LIVER, GILL, KIDNEY, INTESTINE AND STOMACH OF FRESHWATER FISH, CHANNA PUNCTATUS**

**KEY WORDS:**

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**ABSTRACT**

This study was carried out on fish channa punctatus to investigate the lethal concentration of cadmium nitrate in liver, gill, kidney, intestine and stomach of fresh water fish channa punctatus compare to control one. LC50 for cadmium nitrate is 0.57 ppm. Fish exposed to 96hr. LC50 of cadmium nitrate. Cadmium increases the rate of glycolysis.

**INTRODUCTION**

The biochemical investigations help us understand the mode of action of toxicants on the aquatic animals and cause for death by poisoning. Since the stress condition cause alteration in metabolic cycles, it is necessary to understand the significance of these variations in the organic contents of tissues. Proteins are basic molecules to any living system. In cells they function as structural materials, enzymes, lubricants and carrier molecules.

Carbohydrates play a structural role as well as acts as a reservoir of chemical energy to be increased or decreased according to organisms need. Glycogen in the tissue is also considered to be the major source of energy to adapt to the environment conditions. Animals store glycogen which is considered to be the immediate source of energy and hence all metabolic events depend upon the breakdown of glycogen.

In present investigation to see the effect of cadmium nitrate on the freshwater fish, channa punctatus on glycogen after exposure of 96 hours LC<sub>50</sub> of cadmium nitrate i.e. 0.57ppm

**MATERIAL AND METHODS**

The selected model animals the freshwater fish channa punctatus were collected from yeldari dam parbhani district. After collection the fishes were acclimatized in the laboratory condition at room temperature for 2-3 days.

The acclimatized fishes were separated into 2 batches. A and B. A group of 10 Fishes of uniform size and weight were selected. Physico-chemical parameters of water was maintained same in all two batches of fish A batch was maintained as control and B batch of fishes was exposed to lethal concentration of 0.57 ppm of cadmium nitrate.

The fishes were scarified immediately at the end of exposed period i.e. 96 hours and tissue selected for the biochemical estimations gill, liver, kidney, intestine and stomach were excised rapidly and processed for biochemical estimation. These organs are physiologically important hence selected for the biochemical studies.

Glycogen are estimated by Anthrone method.

**RESULT**

The glycogen content for the control group was 50.0, 7.50, 11.90, 9.40 and 13.40 mg/gm/wt. of tissues in liver, kidney, gill, intestine and stomach respectively. The effect of cadmium nitrate on the tissues at experimental group

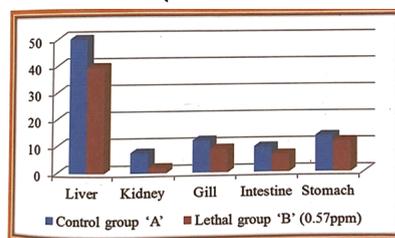
i.e. lethal concentration, the glycogen content were 39.40, 2.0,

8.30, 6.60 and 11.40 mg/gm/wt. of tissues in liver, kidney, gill, intestine and stomach respectively. The percent decrease of glycogen was maximum in kidney (73.33%) Followed by intestine (29.78%) in gill (26.05%) in liver (21.2%) and (14.92%) in stomach to the lethal concentration of cadmium nitrate for 96 hours exposure period (Table No.1) and (Fig No. A)

**Table No.1.1 Effect of lethal concentration of cadmium nitrate (LC<sub>50</sub>) on glycogen content in liver, gill kidney intestine and stomach of freshwater fish, channa punctatus.**

Sr.No.	Tissues	Control group 'A'	Lethal group 'B'(0.57ppm)	Difference
1.	Liver	50.03.37	39.401.4(21.2%)	10.6
2.	Kidney	7.501.04	2.00.65(73.33%)	5.5
3.	Gill	11.900.59	8.801.20(26.05%)	3.1
4.	Intestine	9.400.61	6.600.56(29.78%)	2.8
5.	Stomach	13.401.03	11.400.78(14.92%)	2.0

All values are expressed in mg/gm/wt. Each value is the mean of six observation (



**Figure No. A** Effect of lethal concentration of cadmium nitrate (LC<sub>50</sub>) on glycogen content of liver, kidney, gill, intestine and stomach of fish at 96 hours exposure to Channa punctatus.

**DISCUSSION**

This study clearly indicates that adverse effect of cadmium nitrate on freshwater fish, channa punctatus. Liver decreased in glycogen level in all experimental organs in this study might impact the result of cadmium stimulating the activities of enzymes that work in glycolysis. In the present investigation total lipids were decreased significantly in cadmium nitrate exposed fishes in all organs the highest reduction in lipid in kidney and liver. glucose content is increases significantly in all the organs of experimental fishes highest glucose is increased in liver possibly due to increases the rate of gluconeogenesis.

Prabhakar and saleshrani (2012) worked on the biochemical

parameters of fresh water fish *Cirrhina mrigala* and reported that a significant decrease of glycogen content in liver, gills and kidney of metal treated fishes when compared to their controls similarly the protein level were decreased in gills, liver and kidney of cadmium sulphate treated fish compare to their controls. In the present study to expose to cadmium nitrate on *Channa punctatus* similar finding were recorded. Bhatkar et. Al (2004) determined sub. Lethal effects of CrCl<sub>2</sub>, NiCl<sub>2</sub>, and ZnCl<sub>2</sub> on the biochemical parameters of the Fish *Labeorohita* and reported that the after 10 days of exposure to CrCl<sub>2</sub>, NiCl<sub>2</sub> and ZnCl<sub>2</sub>, blood glucose level increased by 48.11%, 71.71% and 68.35% respectively. He stated that the after 20 and 30 days of treatment, Significant decrease in glucose level were recorded and protein and glycogen content of liver and muscle were depleted in all experimental fish.

Mostafa, et. Al (2014) worked on impact of water pollution with heavy metal on fish health concluded that there was strong evidence of a correlation between heavy metals concentration in different fish tissue and those of the surface water of polluted areas the accumulation of metals in fish tissue depends upon numerous factor such as environmental concentrations environmental conditions that is pH, water temperature, hardness, exposure duration and species specific living and feeding habits.

### CONCLUSION

In the present investigation of biochemical estimation of glycogen level decreased in all organs of experimental fishes. Glycogen decreased in liver 50.0 mg/gm/wt. to 39.40 mg/gm/wt, in kidney it is 7.50 mg/gm/wt. to 2.0 mg/gm/wt, In gill 11.90 mg/gm/wt. to 8.80 mg/gm/wt. in intestine it decreased 9.40 mg/gm/wt. to 6.60 mg/gm/wt. in stomach it is 13.40 mg/gm/wt. to 11.40 mg/gm/wt. Decreased in glycogen in various tissue of experimental fish is clearly indicate that, cadmium increases the rate of glycolysis, in which rapid utilization of glycogen for synthesis of glucose to meet the enhanced energy demanded under the stressful condition.

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