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## **Toxicological Effect of Lead Nitrate in Some Fresh Water Fish Glossogobius Giuris (Ham.)**

**ORIGINAL ARTICLE**



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### **Abstract**

**In the present study histopathological changes caused by lead nitrate in 15 mg/l were noted in *Glossogobius giuris*. Toxicological effect in the alimentary canal showed rupturing of the villi, fusion of mucosal folds, vacuolization and swelling of lateral sides. Liver changes were seen as atrophy of hepatocytes, vacuolization and degeneration of cell boundaries of hepatocytes. As the toxicants enter through the gastro-intestinal tract, so it causes acute effects in liver and mucosal ruptures.**

### **Keywords**

**Histopathological, Fish, *Glossogobius*.**

### **Introduction**

It is well established fact that indiscriminate use of pesticides, and the presence of heavy metals at the trace or ultra-trace levels of the environment has drawn global attention in higher concentration of Cu, Ca, Pb and Zn might kill organisms or may cause other adverse effects and change the structure of aquatic community. In the present study lead nitrate is selected, because this in very low concentration exerts toxic effects by changing the Physio-Chemical conditions of the entire environment, the species composition and water quality conditions, In the present & study fish was used because it helps in determining the quantity of the damage, which is likely to be transferred to the human population by the consumption as a food. The present investigation is therefore aimed to assess the toxicological effects in the digestive organs-alimentary canal and liver, of *Glossogobius giuris*, on account of lead toxication.

### **Literature Review**

Various investigators have studied the toxicological effect on entire system of fishes and have highlighted the toxic effect of heavy metals. Bowser et.al. (1990) studied the prevalence of liver lesion in brown bull heads and found that histological effects of liver & samples may serve as and chemical contaminants. Kulshreshtha and Johar (1983) studied the histopathological changes in the intestine of *Channa striatus*, - induced by sublethal concentration of Endosulphan and Carbaryl, Poison et. al, (1983) found high concentration of lead in liver and kidney of animals. Kulshrestha et al (1986 a) observed hypertrophy, degeneration necrosis in the liver of few teleost fishes. Salim and Khan (1984) observed

partial vacuolization, initial of hepatic cells which later becomes sinusoids degeneration. Similar observations. Were seen in the present study. Kulshreshth (1986) reported the toxicity of heavy metals in the intestine bulb and intestine of fishes and also observed that the outer layer serosa is ruptured and villi were thin and elongated, mucosal folds shows atrophy and vacuolisation.

Thayi (1991) studied lead toxicity effects in the digestive tract of a fresh water teleost and found swelling of mucosal folds, vacuolisation, and rupture serosa. Similar observation were made in the present study.

### **Methodology (Materials and Methods)**

For the present study the fish *Glossogobius Giurius* was selected as the experimental fish, because it is easily available in the local fresh water boisean of its convenient size and hardy nature. It is available throughout the year. The fishes were collected from the fresh water bodies and immediately treated with 0.1% Potassium Permanganate solution for few minutes to get rid of any dermal infection, and then transferred to a large aquarium for observation for fishes were fed with dry shrimp powder, and the waste were settled at the bottom of the aquarium was removed by the siphon. In this way the fishes were acclimatized in the laboratory condition. The aquarium with control (no toxicant) 10mg/l, and 15mg of lead nitrate were maintained. Each aquarium contained 15 fishes to 30 litre of water. After 90 days control the fishes were sacrificed (dissected) and the desired organs alimentary canal and liver were fixed in aqueous Boui's fluid-a fixative. The tissues were dehydrated later through graded Alcohol, and then embedded in Paraffin wax and then sectioned at a thickness of 6 microns. Sections were dehydrated and stained with haemotoxyline and Eosine and lastly mounted with D.P.X, and kept for observation, Lastly Physico-chemical analysis of the test and control x water was done after seven days.

### **Observation and Results**

In the present investigation the liver of *Glossobius Giuris* has large number of vacuolated cells with eccentric nuclei. Liver in different test concentration showed the following observations; At 10mg/l (concentration of toxicants atrophy of hepatic cells, formation of vacuolated spaces, disintegration of cell boundaries of liver cells and eccentric nuclei due to the separation of hepatic cells were observed. At 15mg/l concentration vacuolization, disunification of hepatic cell boundaries were observed, atrophy is much prominent, while the controlled set showed normal pattern of liver with large sized hexagonal hepatocytes with centrally placed nucleus and homogenous cytoplasm. These glandular tubes of hepatic cells are arranged in a radial network like pattern around central vein.

The intestine of *Glossobius gluria* is differentiated into four layers - Mucosa, Submucosa, Muscularin and serosa. The mucosa is raised into number of longitudinal folds. In the anterior part of the intestine at 10m/l concentration of lead nitrate separation of mucosa from submucosa. Destruction of villi, folding of mucosal folds, and rapturing of serosa were observed. At 16mg/l concentration much rupturing of mucosa and aerosaware observed, vacuolization is also observed with distortion of villi. In the controlled not normal mucosal folds along & villi and absence of vacuolization.

Beside the above observation the *Glossobius Glurie* intestine shows some distinct observations- in the different concentration lead nitrate. At 10mg/l concentration of lead nitrate swelling of lateral side mucosal folds. rupturing of muscularis and rupturing of serosa and fusion of villi. At 15mg/l of lead nitrate, the increased distortion of mucosal folds, rupturing of serosa and vacuolization. The Controlled set showed normal condition of mucosal folds , absence of vacuolization and normal muscularis.

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