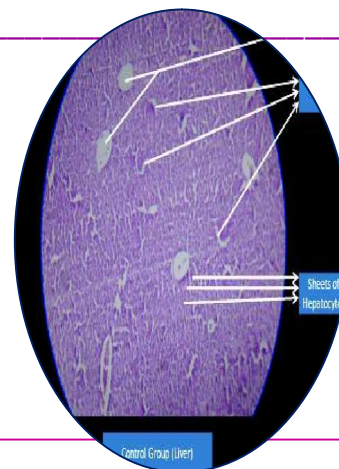




## EFFECT OF PYRETHROID TOXICITY ON HEPATIC AND GONADAL TISSUES OF HETEROPNEUSTES FOSSILIS: AN OVERVIEW

**Smriti**

Research Scholar , Faculty Of Science (Zoology) ,  
L.N.M.U Darbhanga.



### ABSTRACT

*The hematology is a growing field of research in animal biology and the importance of hematological research has considerably increased due to the impacts of environmental pollution to indicate the level of harmful effects on animals it has been a dependable diagnostic tool in the treatment of diseases but studies on fish hematology is very scarce. The present review paper will present the new review aspects of pyrethroid toxicity on HETEROPNEUSTES FOSSILIS*

**KEYWORDS:** hematology , environmental pollution , hematological research.

### INTRODUCTION:-

The hematological parameters vary according to change in age, sex, season and administration of toxicants. The variations in the hematological parameters due to toxicants have been worked out by Breur and Baldwin (1995), Maqueet et.al., (1993); Agrawal and Srivastava, (1980), Banerjee and Verma (1992), Banerjee (1986), Das and Konar (1990), Gilbert (1968) Quli and Banerjee (1994) and Rani (1999), Sharma and Saxena (1997). A number of references are available on the age and body weight related hematological variations in fish but scanty literature is available on hematological changes in due to toxic impact of pesticides.

The study of pesticides assumes further significance in view of the fact that recently pesticides are mixed to sub lethal levels in management of water bodies for protection of fish fauna (Mohan and Selva Kumari, 1999).

Contamination of water bodies adversely affects the life of fishes by altering their physiology and reproduction (Hoar et.al., 1983, Singh and Singh, 1980) behavior pattern (Anderson, 1971) growth and nutritional value (Arunachalem et. al, 1980; Ghosh and Konar 1979, Ahsan, 1986), Cellular morphology (Mukhopadhyay and Dehadrai, 1980) and physiology (Bhaskaran, 1980, Natrajan, 1981) etc.

### MATERIALS AND METHODS:

A static bio-assay test was done to determine LC<sub>50</sub> of permethrin to Heteropneustes fossils following the methods of APHA, AWWA and WPCF (1985) and sublethal concentration was calculated by adopting the formula of Hart et.al. (1945). For each experiment the fish (average length 22-24 cm. and weight 38-43gm)

were exposed to a sublethal concentration for a period of 15 and 30 days. Side by side a control was also run in equal volume of water (pH 7.6, temp. 34.6° C hardness in mg/l as CaCO<sub>3</sub> 194.22). The exposure medium was renewed every 24 hours. At the end of exposure period that is on day 15 and 30 the fish were anaesthetized with 1:4000 MS 222 (tricane methane sulphonate Sandoz) and then processed for quantitative estimation. The extraction of total lipid was done as per the method of Floch et.al. (1957). In present study statistical analysis and 't' test (Campbel,, 1974) were done.

## DISCUSSION

In view of the fact, the present study has been designed to understand the impact of sublethal concentration of Permethrian (Pyrethroid) for the period of 15 and 30 days on fish *Heteropneustes* which are highly tenable in the laboratory condition and are commonly available fish of the area with high nutritive and covalence value.

The findings of this study may enable us to suggest the horticulturists and farmers about the impacts of Permethrian (Pyrethroid) on fish directly and human being indirectly through food chain when its use can't be checked spontaneously but reasonable limit of its use can be suggested.

Keeping all facts and literature in detail it was worth while to see the sub lethal toxic impact. On fish for 15 and 30 days exposure periods.

Hence, the present investigation has been designed on the following parameters.

In recent years, pesticides are being widely used to control the various pests of out crops. Pesticides used ultimately reach the nearby water bodies through rain irrigation, surface runoff, etc and affect the entire ecosystem. The dominating group of the aquatic system, fish is the most affected animal. Much emphasis is being made to evaluate the effect of pesticides on the general organization of fishes. The pesticides reaching the aquatic system gets enterenched into the aquatic food chain through bio-accumulation, bio-concentration and biotransformation processes. Ramaswami (1990) stated that the pesticides accumulated in the tissues of fishes alters the bio- chemical constitution of the body. The effect of thioden, dithane and nuvan on biochemical constituents in muscle, liver and kidney and other organs have been worked out by several (Ghosh, 1987).

Very scanty information is available with regard to toxic effects of pesticides to fish (Ghosh & Chatterjee, 1988, Reddy & Basha Mohiddin 1983, Prasad et.al.; 1991 Dutta et.al.; 1994, Srivastava et.al.; 1995, Singh 2002, Pandey 2003, Mukhopadhyay et.al.; 2005. Rita & Milton, 2006).

Rao and Rao (1981) and Babu et.al.; (1988) had reported a decrease in glycogen, total carbohydrates and lipid contents in tissues of sarotherodon mossambicus exposed to pesticides. The work of Ghosh (1987), Ramaswami and Maheswari (1993). Shrivastava and Singh (1997) are also note worthy. From the available literature it was found that the pesticide exposure impairs the biochemical constituents in the experimental animal, fish. Though much work has been done to trace the quantity of the biochemical lesions in several fishes, less attention has been focused on the cat fish.

Although the extensive use of pesticides, insecticides herbicides, Weedicides and fungicides are being promoted by Government and Non-government agencies of India to enhance the crop production to meet the demand of the growing population.

## ACCLIMATION AND FEEDING:

The fish *Heteropneustes fossilis* (Bloch) locally called "Singh" belonging to the family Heteropneustidae of the order Siluriformes, were chosen for the present study. These were collected live form a local fish pond with the help of fisherman.

## REFERENCES:

1. Floch, J., Less, M.and Sloane - Stanley, G.H. 1957. A simple method for isolation and purification of total lipid from animal tissues. J. Biol. Chem. 226: 496-507.

2. Ghosh. T.K. and Chatterjee, S.K. 1988. Toxic influence on fenvalrate on the biological parameter of the fish, *Anabas testudineus*. *Environ. Ecol.* 6(1): 107-110.
3. Jabde, P.V. Ansari, N. and Joshi, C.S. 1995. Biochemical changes in the muscles of a freshwater fish *Neomachilus aureus* exposed to pyrethrid insecticide, cypermethrin. In: *Toxicity and Monitoring of Xenobiotics*. (edds. R. Prakash and P.P. Sood). Venus Publishing House, New Delhi, India p. 191-197.
4. Jha, A.N. 1992. Changes induced by heavy metal toxicity on an air-breathing teleost. A biochemical study, Ph.D. Thesis, L.N.Mithila University, Darbhanga.
5. Katti, S.R. and Sathyanesan, A.G. 1983. Lead nitrate induced changes in the lipid and cholesterol levels in the fresh water fish *Clarias batrachus* *Toxicology letter* 19: 93-96.
6. Kumari, A. and Kumar, R. 2016. Behavioral responses and acute toxicity of *Anabas testudineus* to pesticide methyl parathion. *Bioglobbia* 3(1): 11-15 <http://www.bioglobbia.in> (indexed in WoS, Impact Factor 4.441).