



**STUDY THE EFFECT OF CYPERMETHRIN PESTICIDE ON BEHAVIORAL  
RESPONSES IN FRESH WATER FISH *LABEO ROHITA***

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**ABSTRACT**

The public health effects of pesticides cannot be denied. However, the undesired effects of chemical pesticides have been recognized as a serious public health concern during the past decades. The present study describes the toxic effects of cypermethrin pesticide in fish and it was analysis by High Performance Liquid Chromatography (HPLC). Cypermethrin is induced in fish body than functioning of all organs of fish body is delay finally dead and it is dependent upon nature and concentration of pesticide. In this paper, we report that cypermethrin has a higher potential to cause toxic effects in fish and may also pose a life risk for human beings.

**KEYWORDS:** Cypermethrin, HPLC, *Labeo Rohita*, Human health, Pesticides.

**INTRODUCTION**

The pervasive use of pesticides agriculture, public health and forestry ultimately leads to the contamination of aquatic biotopes posing a great threat to the environment.<sup>[1]</sup> The usage of different pesticides in agriculture sector causes to the prevention of crop damage from the pests. In agriculture based countries the usage of pesticides has been enhanced over two decades.<sup>[2]</sup> After using pesticides were run off in to ponds and rivers which alters the physico-chemical properties of water and also toxic for aquatic microorganisms.<sup>[3]</sup> The exposure pesticides of on non-target organisms and the biochemical changes occurring in the fish body.<sup>[4]</sup> Several investigators have reported many changes in biochemical parameters of the aquatic organisms due to absorption of pesticide from different sources.<sup>[5]</sup> Hence the present study the impact of the Cypermethrin pesticide on the non – target organism in fresh water fish *Labeo Rohita* in energy metabolic changes.

**2.0 MATERIALS AND METHODS**

*Labeo Rohita* finger lings weighing 5±0.5g and average length of 7cm were collected from the Government fish seed farm Ponnuru, Guntur District, Andhra Pradesh, India and acclimatized to laboratory conditions for 7 days in large plastic tubs previously washed with potassium permanganate to free walls from any microbial growth physico- chemical characters of water was maintained according to methods in APHA<sup>6</sup> and found as follows.

Temperature: 27±1°C, p<sup>H</sup>: 6.8 ± 0.05 at 27°C,

Dissolved oxygen 6.9 to 7.4 mg/l. During acclimatization time were given food regularly by commercially available fish feed. For the present investigation technical grade. Cypermethrin (92.75%) was obtained from Agro Industries Limited Guntur, A.P, India.

**2.1 Preparation of standard sample solution**

We have taken the organs from pesticide induced fish, then organs taken in to boiling test tube then added to pure Hexane (AR) then boiling after pesticide settled at inside walls of the test tube, and removed the fish organ from the test tube bottom and again added hexane for dissolving the pesticide in test tube walls. These sample solutions are analysis of protein and amino acids by using HPLC and Gas chromatographic techniques.<sup>[7]</sup>

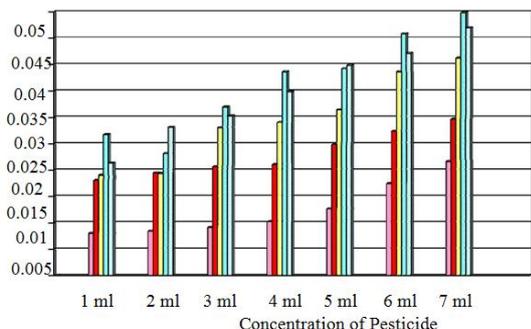
**3.0 RESULTS AND DISCUSSION**

Proteins are primary and importance in the living world not only because of their peculiarity but also because of the fact that they appear to confer their biological specificity among various type of cells.<sup>[8]</sup> In fish proteins are of the main energy sources play an important role in the maintenance of blood glucose.<sup>[9]</sup> It is the most fundamental biochemical constituent present abundantly in the body of fish. The result presented in Table -1.

**Table 1: Estimation of cypermethrin pesticide in fish organs.**

Conc. of Pesticide (ml)	Gill (Mg/L)	Head (Mg/L)	Digestive System (Mg/L)	Liver (Mg/L)	Muscle (Mg/L)	Total
1.0	0.0213	0.0267	0.0190	0.018	0.0080	0.0930
2.0	0.0281	0.0231	0.0196	0.0194	0.0084	0.0983
3.0	0.0302	0.0319	0.0280	0.0206	0.0091	0.1198
4.0	0.0348	0.0386	0.0290	0.0210	0.0102	0.1336
5.0	0.0398	0.0392	0.0314	0.0248	0.0126	0.1478
6.0	0.0421	0.0458	0.0386	0.0273	0.0174	0.1732
7.0	0.0469	0.0498	0.0412	0.0296	0.0216	0.1891

The change in Protein observed in various tissues after the pesticide induced along with control was graphically represented in Figure -1.



Initially insignificant alteration of proteins at the end of 24 hours was observed in the tissues suggesting that the fish tend to resist the sudden stress for shorter duration<sup>[10]</sup>, later with increases of time the decrease of protein content became significant and maximum

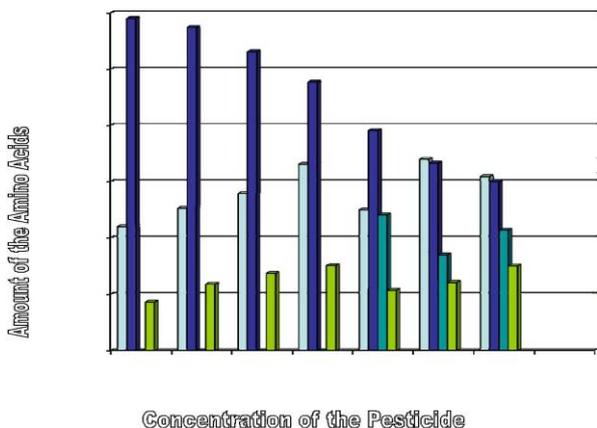
depletion was observed in the head followed by gill (24.8%) head (26.33%), digestive system (21.78%) liver (15.65%) muscle (11.42%). However, increases of consumer concentration of pesticide decreases the protein in tissues of the fish *Labeo Rohita*. The present analysis coincides with the finding of Sastry and Adab Sidiqi<sup>[11]</sup>, who reported that the protein content was decreased in liver, muscle similar reports of Durairaj and Selvarajan<sup>[12]</sup> Anusha Amali et al<sup>[13]</sup> yeroji et al<sup>[14]</sup> and Tilak et al<sup>[15]</sup> support the present data.

**3.1 Amino acids**

From the proteins research work, after the consumed the pesticides, proteins are degraded then change the sequence of amino acids from original sequence in the iso propyl alcohol medium. In this paper, we can report the measuring of amino acid quantity after degraded proteins in fish body by applying the cypermethrin pesticide. These results are presented in **Table-2**.

**Table 2: Cypermethrin pesticide effect on fish protein.**

Conc. of Pesticide (ml)	Tyrosine (%)	Tryptone (%)	Valine (%)	Phenyl Alanine (%)
1.0	22.0	59.0	0	8.6
2.0	25.3	57.4	0	11.8
3.0	27.9	53.1	0	13.7
4.0	33.1	47.7	0	15.1
5.0	25.0	39.1	24.1	10.7
6.0	34.0	33.3	17.0	12.1
7.0	34.9	30.0	21.4	15.04



Valine amino acid is not affected in protein degradation at low concentration and Tyrosine. Tryptophan, Phenyl alanine are affected at all concentrations of cypermethrin pesticide. This degradation is due to presence of cyanide group and chlorine atoms present in the pesticide.

**4.0 CONCLUSION**

In conclusion, the cypermethrin is highly toxic to fresh water fish and it is using cypermethrin in any aquaculture processes, the estimated safe and dischargeable concentrations should be considered important to protect living organisms in *Labeo Rohita* fish and also create the disorders in human health.

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