

## Effect of chloropyriphos on protein levels of *Channa punctatus*

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### ABSTRACT

Fish are important source for human consumption. Indiscriminate use of pesticides to protect crops possess a severe threat to the aquatic organisms. When *Channa punctatus* is exposed to an organo-phosphorous insecticide, chloropyriphos exhibited notable alterations in protein levels of muscle, liver and kidney. The decrease may be due to breakdown of proteins under toxic stress.

**Keywords:** *Channa punctatus*, pesticide, toxic stress, protein.

### INTRODUCTION

Pollutants are posing a great threat to aquatic life especially to fish (Ghosh *et al.*, 2006; Abdul *et al.*, 2010). Fish provide animal protein to mankind. Pesticide use also affects non target organisms. They effect the metabolic aspects of aquatic organisms.

Unabated use of pesticides causes bioaccumulation and bio-magnification in different organisms at different trophic levels, ultimately effecting the aquatic as well as other consumer organism and they get circulate in ecosystem.

As the fish are good bio-indicators of water bodies, an attempt has been made to analyse the protein level changes in different tissues of the fresh water fish *Channa punctatus*

### MATERIAL AND METHODS

*Channa punctatus* have food and economic value; they are available throught all seasons of the year. The fish of equal length were selected from unpolluted water bodies of Warangal region.

#### How to cite this article:

B. Devendar, G. Venkateshwar Rao (2015). Effect of chloropyriphos on protein levels of *Channa punctatus*. *Biolife*, 3(3), pp 685-687.

Fish were divided into control and experimental groups. The experimental organism is transferred into test solution of sub lethal concentration of LC 0.008 ml/L.

The fish were scarified after 24, 48, 72 and 96 hours. Different tissues like muscle, liver and kidney were assayed for protein level variation by Lowry method (1951). Both soluble and insoluble proteins were estimated in muscle, liver and kidney 24, 48, 72 and 96 hours of exposure relative to control group.

### RESULTS AND DISCUSSION

Protein levels were decreased in all the tissues studied *i.e.* muscle, liver and muscle. There is a great decrease in soluble and insoluble proteins in muscle, liver and kidney of *Channa punctatus* after exposure to chloropyriphos relative to control. Insoluble proteins have also shown similar trend. The results obtained were presented in [table-1](#) and [Figure-1](#).

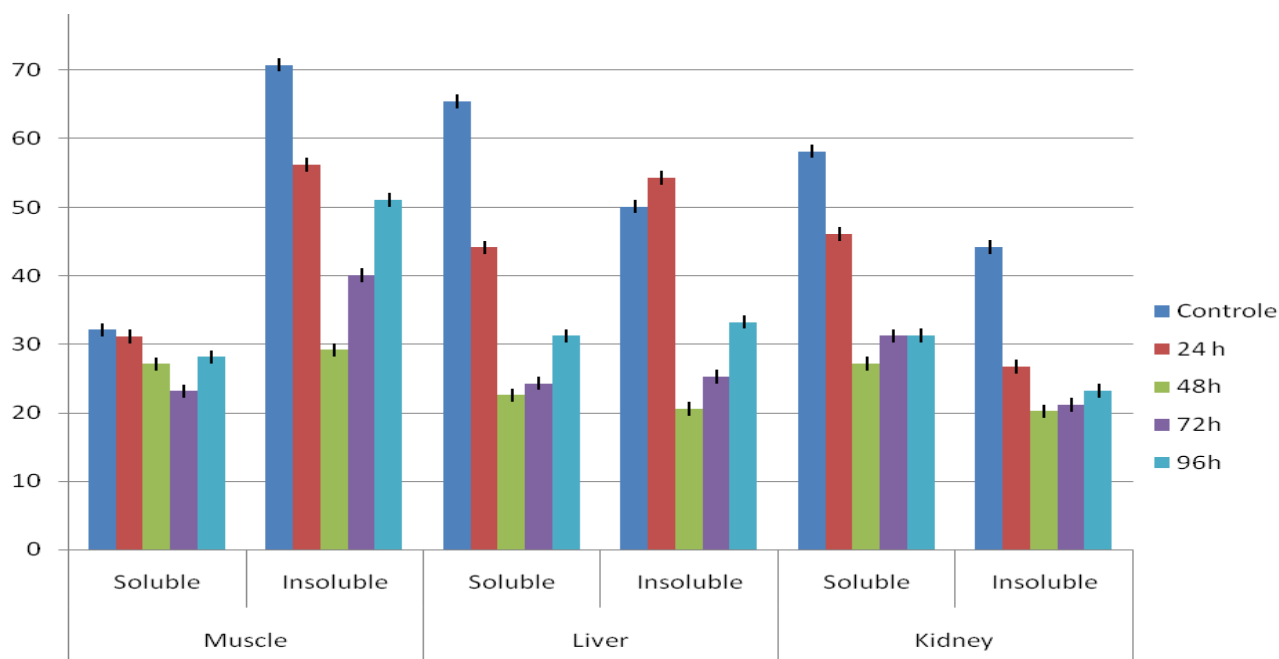
Mishra (1980) has also reported reduction in protein levels. The present work finds support from previous reports on protein level variations (Naveed *et al.*, 2010; Jaroti *et al.* 2005, Padmapriya *et al.* 2012; Ramesh Raju *et al.* 2010; Madhusudhan reddy *et al.* 2011, David *et al.* 2004).

Physiological activities of the animal reflect in metabolic status of the protein (Nelson and Cox, 2005). Proteins are involved in architecture of the cell. Jrueger *et al.* (1968) reported the possible utilisation of proteins for generation of energy.

**Table.1. Protein variation (mg/gm wet weight of tissue) in different tissues of *Channa punctatus* exposed to chloropyriphos at different time intervals (each value is a mean of six values with ± SD).**

	proteins	Control	24 hour	48 hour	72 hour	96 hour
Muscle	Soluble	32.1±1.20	31.11±1.50	27.10±1.70	23.12±1.50	28.12±1.20
	Insoluble	70.80±1.27	56.21±1.90	29.14±2.10	40.10±1.20	51.10±2.0
Liver	Soluble	65.49±1.83	44.12±2.1	22.56±1.98	24.28±2.1	31.20±1.67
	Insoluble	50.12±2.10	54.31±2.70	20.52±3.1	25.29±2.1	33.23±3.1
Kidney	Soluble	58.20±3.1	46.11±1.2	27.21±1.99	31.20±1.80	31.23±1.2
	Insoluble	44.21±2.3	26.71±2.12	20.19±1.62	21.19±1.23	23.20±2.12

**Figure-1. Protein variation in different tissues of *Channa punctatus* on pesticide exposure.**



Decreased protein levels in liver, muscle and kidney may be due to their degradation and utilisation for metabolic activities, since the fish is under toxic stress (Mastan and Ramanayya, 2010; Sushma Pallewad, 2015 and Himansu Bhusan Mahananda, 2014). The [figure-1](#) Histogram showing protein variation in different tissues of *Channa punctatus* on pesticide exposure.

### Acknowledgment

The author is grateful to Prof. G. Venkateshwar Rao, for his constant encouragement.

### Conflict of Interests:

The authors declare that there is no conflict of interests regarding the publication of this paper.

## References:

1. Abdul N.C., Janaiah D. and Venkateshwarlu P., The effect off Lihocin toxicity on protein metabolism of the freshwater edible fish *Channa punctatus* (Bloch). *Journal of Toxicology and Environmental Health Sciences*, 2010.3: 018-023
2. Desai, H.S., Nanda, B. and Panigrahi, J. Toxicological effects on some biochemical parameters of freshwater fish *Channa punctatus* (Bloch) under the stress of nickel. *J Environ Biol*. 2002. 23(3): 275-277.
3. Ganeshwade, R.M. Biochemical changes induced by Dimethoate in the liver of freshwater fish *Puntius ticto* (Ham). *Biological Forum-An International Journal* 2011. 3(2): 65-68.
4. Himansu Bhusan Mahananda. Alterations in some haemato-bio-chemical parameters of a fresh water, airbreathing fish, *Channa punctatus* (Bloch) under the stress of chronic, sublethal dose of nickel. *Biolife*.2014.2(4):1392-1397
5. Lowry .O.H., Rosenbrough M.J.,Farry A.L. and Randall R.J., Protein measurement with folin-phenol reagent. *J.Biol.Chem.*, 1993.:265-275.
6. Mukhopadhyay and Dehadrai P.V.,Biochemical changes in the air-breathing cat fish *Clarius batrachus* (linn) exposed to malathion. *Environment Pollution Series A, Ecological and Biol.*, 1980.22:149-158.
7. Mamata Kumari. Biochemical changes induced by the pesticides abate in the liver of cat fish *Heteropneutes fossilis* (Bloch). *Environ and Eco*. 2007. 225(4): 1164-1166.
8. Murthy, A.S. and Devi, A.P. The effect of endosulfan and its isomers on tissue protein, glycogen and lipid in the fish *Channa punctatus*. *Pesticidal Biochem Physiol*. 1982.17: 280-286
9. Nagratnamma and Ramamurthi, R. Metabolic depression in the freshwater teleost *Cyprinus carpio* exposed to an organophosphate pesticide. *Curr Sci*. 1982.51(B): 668-669.
10. Tantarvale. S.A.. Cypermethrin impact on total protein in muscle and liver of the freshwater fish *Channa striatus*. *J Science Research Reporter* 2011 1(3): 155-158.
11. Tilak, K.S. and Rao, D.K. Chlorpyrifos toxicity of freshwater fish. *J Aqua Biol*. 2003. 8(2): 161-166.
12. Somaiah, Sunita, and Nagaraju, Effect of phenthoate on protein levels of freshwater fish *Labeo rohita* (hamilton) 2014. 2(2):475-479.
13. Narasimha MB, Sathya Prasad K, Madhu C, Ramana R KV Toxicity of Lindane to fresh water fish *Tilapia mossambica*. *J. Environ. Ecol.*, 1986.4: 1.
14. Sushma Pallewad, Sanjay Shamrao Nanware and Dhanraj Balbhim Bhure. Incidence of infection of trematode genus *Azygia looss*, 1899 parasitic in freshwater fish *Channa punctatus*. *Biolife* 2015, 3(1) 187-191.

DOI: <https://dx.doi.org/10.5281/zenodo.7294448>

Received: 4 July 2015;

Accepted; 22 August 2015;

Available online : 6 September 2015