

TOXIC EFFECT OF AQUEOUS EXTRACT OF GARLIC ON PROTEIN CONTENT IN FISH *CHANNA PUNCTATUS*.

Dube K.V* and Mali R. P.

*P.G. Department of Zoology, Yeshwant Mahavidyalaya Nanded-431603, India

E-mail of Corresponding Author: kaushaldubey2004@gmail.com

Abstract

In the present investigation, the effect of sub lethal concentration of the garlic aqueous extract on fish *Channa punctatus* were studied after 24 hrs, 48 hrs, 72 hrs and 96 hrs exposure respectively. Different concentrations of garlic (10 ppm/lit, 15 ppm/lit) used against Protein content of fish and results showed the gradual decrease in the protein content, ranging (106.14 – 91.65 mg/gm) for 10 ppm/lit for (24 hrs – 96 hrs) and (103.90 - 88.13 mg/gm) for 15 ppm/lit respectively

Keywords: Garlic, protein content, *Channa punctatus*

1. Introduction

Weed fishes and predatory fishes contribute a serious problem for fish culture practices in India. It thus affects the yield. To address this issue, the use of synthetic pesticides has been employed commonly in many aquaculture farms. A large number of compounds of various classes that, have insecticidal, piscicidal and molluscicidal properties have been observed by Singh¹². A number of compounds like tannins, alkaloids, alkyl phenols, terpenoids, saponins etc. which are found in several plants of different families with piscicidal activities are used to control of fish^{11,12,13}.

Due to their long term persistence in the aquatic systems, it gets accumulated in the fish body. It adversely affects the quality of fish and their status due to contamination of aquatic environment. Studies are being carried out on the feasibility of using biopesticides or plant extract to overcome this problem. Nowadays, the use of medicinal plants has become an effective alternative for synthetic pesticides and fertilizers. In the present investigation, the toxicity of aqueous extract of garlic has been observed on Protein content expressed as mg/gm in fish *Channa Punctatus*. It is an important food fish and is widely distributed across the Indian sub-continent.

2. Materials and Methods

2.1 Experimental animal: Healthy and live specimen of fish *Channa punctatus* were collected from the local fish market. The fish was brought to laboratory and then properly washed in tap water. They were treated with 0.02% KMnO₄ solution to remove any type of microbial infection. Before experimentation, only normal un infected healthy fish were selected for the

experiment and were transferred into glass aquaria containing 25 litre of chlorine free water for acclimatization. The determination of LC₅₀ value was analyzed statistically by log dose/probit regression line method⁵

2.2 Preparation of aqueous garlic extracts: The cloves of *Allium sativum* were collected from the local market of Nanded city. Plant material was dried and ground. To prepare the aqueous extract, the powder was dissolved in distilled water at a concentration of 5 gm per litre for 24 hours at room temperature. The mixture was filtered and the extract (5 gm/l) was used immediately in the experiments in different dilution.

3. Result

The results observed in the present investigation showed significant changes in the protein content in the muscle of fish *Channa punctatus* as shown in Table-1.

The protein content mg/gm wet wgt of tissue decreased in muscle from 106.14 mg/gm to 91.65 mg/gm for 24 hrs to 96 hrs respectively was recorded in 10 ppm of garlic aqueous extract concentration similar decrease in protein content mg/gm from 103.90 mg/gm to 88.13 mg/gm for 24 hrs to 96 hrs respectively was recorded in 15 ppm of garlic aqueous extract concentration.

4. Discussion

In present investigation the protein content of muscle was decrease significantly.

A decrease in the protein content mg/gm for both 10 ppm and 15 ppm concentration is due to garlic toxicity and exposure time (Table & Fig 1,2). The decrease in protein content mg/gm has been reported in *Channa punctatus* after exposure to chlorpyrifos^{8,12} and in *Clarias bactachus* after exposure to Sevin⁷

Tiwari *et al*⁹ Reported that the decrease in serum total protein in snake head fish *Channa punctatus* exposed to sub lethal concentrations of lattices of *Euphorbia royleana*.

Ravichandran *et al*¹⁰ reported depletion of protein due to proteolysis after exposing *Oreochromis*

mossambicus to nominal concentrations of phenol.

Bradbury *et al*² Pointed out that the decreased protein content might also be attributed to the destruction or necrosis of the cells and consequent impairment in protein synthesis machinery.

Table 1: Protein content (mg/gm) in muscle of *Channa punctatus* after garlic aqueous extract treatment

Conc. in ppm	Control (Mean ±S.D)	24 hrs (Mean ±S.D)	48 hrs (Mean ±S.D)	72 hrs (Mean ±S.D)	96 hrs (Mean ±S.D)
10 ppm	112.50 ± 2.09	106.14 ± 3.07	100.96 ± 2.69	94.44 ± 1.02	91.65 ± 0.64
15 ppm	110.27 ± 1.44	103.90 ± 3.15	96.73 ± 1.45	92.54 ± 3.88	88.13 ± 1.28

S.D. = Standard deviation, ppm= Part per million.

Fig:1: Protein content in Muscle of fish *Channa punctatus* after exposure to garlic aqueous extract at 10 ppm concentration

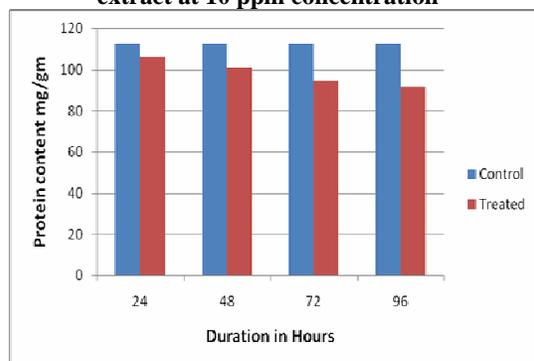
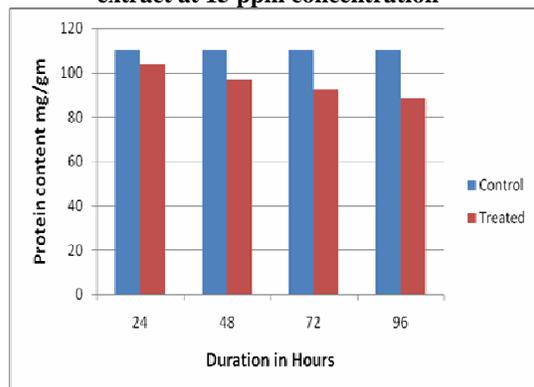


Fig:2: Protein content in Muscle of fish *Channa punctatus* after exposure to garlic aqueous extract at 15 ppm concentration



References

- Blaxhall P C, The haematological assessment of the health of fresh water fish, a review of selected Literature. *Journal of Fish Biology* 1972. 4: 593-604.
- Bradbury, S.P, Symonic, D.M, Coats, J.R and Atchison, G.J , Toxicology of fenvalerate and its constituent's isomers to the fathead minnow (*Pimephales promelas*) and blue gill minnow (*Lepomis macrochirus*). *Bull. of Environ Contam and Toxicol* 1987, 38, 727- 735
- Chaturvedi L D and Agarwal K., aematological changes in *Heteropneustes fossilis* following exposure to alachlor and rogor. *Advance Biosphere*, 1993 12 (11): 85-92
- Dawson A B, The haematological response in the catfish, *Ameiurus nebulosus* to chronic lead poisoning. *Biological Bulletin* 1935, 68(3): 335-346.
- Finney, D.J., Probit Analysis, 3rd, *Cambridge University Press, London* 1971. 25 – 66
- Goel K A and Maya, Haematological anomalies in *Clarias batrachus* under the stress of rogor. *Advance Biosphere* 1986, 5(11): 187-192.
- Kumar B and Benerjee V, Effect of sub lethal toxicity of sevin on blood parameters in *Clarias batrachus* (L) Him. *Journal of Environmental Zoology* 1990, 4: 166-172.
- Malla F.A. *et al* chlorpyrifos pesticide toxicity on protein content in fish, *channa punctatus* (Bloch) *Biology and medicine* 2009, vol 1(2): 54-55.
- Tiwari, S., R.P. Pandey and A. Singh, .Effect of cycloart-24-en-3â-ol from *Euphorbia royleana* latex on neuro-enzyme AChE and oxidative metabolism of freshwater fish *Channa punctatus*. 2008 *African J. Trad. Comp. Alt. Med.*, 5: 332-339.
- Ravichandran, S, Midhunashanthi, K and Indira, N, Impact of phenol on protein metabolism in the freshwater fish *Oreochromis mossambicus*. *J. Of Ecotoxicol and Environ. Mon* 1994., 4, 33-37
- Singh, D. and A. Singh,. The acute toxicity of plant origin pesticides in to the freshwater fish *Channa punctatus*. *Acta hydro. Hydrobiol* 2000; 28: 92-94.
- Singh, S.K., R.P. Yadav and A. Singh, Molluscicides from some common medicinal plants of Eastern Uttar Pradesh, *J Appl Toxicol*. 2010 Jan; 30(1):1-7.
- Tiwari S. and Singh A. (2003): Metabolic changes in the snake head fish *Channa punctatus* due to lattices of *Euphorbia royleana*. *Asian Fisheries Science* 2003; 16 : 147-155.