



**IMPACT OF MONOCROTOPHOS PESTICIDE ON THE TOTAL
PROTEIN CONTENT OF FRESH WATER GASTROPOD *THIARA***

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Abstract

In the fresh water Gastropod *Thiara leneata* were exposed to the lethal concentrations 5.92, 5.46, 5.28 and 4.88 ml/lit. Lc50 values of 24, 48, 72 and 96 hrs respectively. After exposure periods total protein were estimated. The result of the present investigation reveals a significant decrease in protein content. After 72 hrs of exposure maximum decrease in protein content was observed.

Keywords: pesticide, Monocrotophos, Gastropod, *Thiara*

Introduction

The pesticides are toxic substances which are used for pest control in agriculture. The application of pesticides has become one of the modern tools in the agriculture. But indiscriminate use of these has resulted in the contamination of aquatic bodies and affecting sincerely to the non target organisms. These pesticides accumulated in the body of non target organism and damages the organs and systems of the body and disturb the physiological and biochemical processes of the organisms.

The fresh water gastropods are widely distributed along the bank of Mousam and Girna rivers and also in Girna dam, Malegaon

are likely to affected by pesticidal pollution. Monocrotophos is an organophosphate pesticide which is widely used to control the crop pests. Though many workers have reported the impact of pesticides on several species of mollscans but least literature is available on fresh water Gastropods *Thiara leneata* therefore the present work has been under taken to study the effect of Monocrotophos pesticide on total protein content of Gastropods *Thiara leneata*.

Materials and Method:

The fresh water Gastropods *Thiara lenata* was collected from Girna dam near Malegaon. Snails were cleaned in the laboratory and maintained in the plastic troughs for 4-5 days for acclimatization. The snails were fed alternate days and water was changed. Snails were not fed during the experiment. The physic-chemical parameters like temperature, pH, dissolved oxygen, dissolved solids and alkalinity were determined by the standard technique of APHA.

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The snails were grouped in to five batches. The first batch was maintained as a control and second, third, fourth and fifth batches of snails were exposed to 5.92, 5.46, 5.28 and 4.88 ml/liter Lc50 values of 24, 48, 72 and 96 hrs respectively. After exposure periods the snails were dissected and hepatopancreas were taken out for biochemical assay of proteins by Lowery methods (Lowery et al., 1951).

Results

The physic-chemical parameters of water used during the experimentation have

been given in Table-1. The results of the present investigation when snails were exposed to Monocrotophos pesticides for 24, 48, 72 and 96 hrs reveals a significant decrease in protein content. In the control group the total protein content was 214.24 ± 18.16 . The protein contents in experimental snails was determined 202.00 ± 8.36 , 172.62 ± 6.44 , 154.68 ± 9.64 and 166.26 ± 6.32 after exposure to the Lc50 values of 24, 48, 72 and 96 hrs. Slight rise in protein content was observed after 96 hrs of exposure.

Table 1: The values of water parameters

No.	Parameters	Values(ml/L)
1	Temperature	29.5
2	pH	7.2
3	Dissolved oxygen	4.8
4	Dissolved solids	4.56
5	Alkalinity as CO ₃	58

Table 2: Shows the effect of Monocrotophos pesticides on protein content of fresh water Gastropodes *Thiara leneata*.

Group of snails	24 hrs	48 hrs	72 hrs	96 hrs
Control	214.24 ± 18.16	214.24 ± 18.16	214.24 ± 18.16	214.24 ± 18.16
Experimental	202.00 ± 8.36	172.62 ± 6.44	154.68 ± 9.64	166.26 ± 6.32

Discussion

Being an important organic constituent proteins play an important role in cellular metabolism. Proteins regulate the process of interactions between intra and extra cellular media.

In the present experiment when snail *Thiara lenata* exposed to the organophosphate pesticide Monocrotophos a significant decrease in protein content of hepatopancreas was

observed. The decrease in protein content may be due to possible utilization of protein for metabolic purposes and enhanced proteolysis to meet the higher energy demand under toxicant stress. Similar observations were made by Kulkarni et al., (2005). Parate and Kulkarni (2003) suggested that depletion of protein may be due to utilization of protein for the production of energy to mitigate the pesticide stress and to prevent from fatigue due to the

effect of pesticide. Keshavan et.al (2005) reported the depletion of protein content in fresh water crab *Barytelphusa querini* exposed to hidden pesticides. Muley et al., (1987) noticed the decrease in protein content in a Bivalve mollusc *Lamellidens marginalis* exposed to mercuric chloride.

In the present study slight rise in the protein content were observed after 96 hrs exposure. This rise in protein level may be due to anaerobic metabolism which can be increased under stressful conditions being able to cause change in protein content. Similar results have been observed by Rajeshwara et al., (1983). Bhagylakshmi et al., (1981) reported an increase in protein level in the tissues of the crab *Oziotelphusa senex* after sumithion exposure. Sarojini et al., (1989) suggested a decline in protein content in crab *Barytelphusa querini* after exposure to zinc sulphate and copper sulphate. Borane and Zambare (2006) reported that ascorbate effect on the cadmium chloride induced alterations in the protein contents of fresh water fish *Channa orientalis*. Charjan and Raja (2008) suggested that changes in total protein and some inorganic constituents of blood in *Rosbora daniconius* exposed to fenvalerate. Dhapate et al., (2007) reported that effect of endosulfan on protein content of fresh water fish *Nemacheilus botia*.

The study also reveals a need to examine a verity of enzymes from tissues of Gastropods exposed to pesticides. This can provide a possible means of learning something of the mechanism by which a pesticides produce biochemical changes as a physiological stress.

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