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Effect of Malathion on RBC's And WBC's of Labeo Rohita

R. S. Magar

Department of Zoology, Yeshwant Mahavidyalaya, Nanded, Maharashtra, India

ABSTRACT

Indiscriminate use of pesticides has elevated the risk of contamination of environment and aquatic habitat. Considering above fact, the present investigation was carried out to study the impact of sublethal concentration of malathion exposed after 24, 48, 72 and 96 hours on RBC's and WBC's of *Labeo rohita*. The blood analysis showed significant decrease in RBC's and WBC's content of treated group compared with control.

Keywords : *Labeo rohita*, Malathion, RBC, WBC, Blood

I. INTRODUCTION

Increased use of pesticides in most tropical countries has been reported to result in severe toxicities and bioaccumulation (Palmer 1972). Therefore, there is need to investigate the toxicity of Malathion which are very often used for pest management in agriculture and run off in water bodies. *Labeo rohita* is a common food fish in India.

Malathion is a non systematic, wide spectrum organophosphurus insecticide. It was one of the earliest organophsphate insecticides developed in 1950. It was used for agricultural and non-agricultural purposes. Once malathion is introduced into the environment, it may cause serious trouble to aquatic organisms and is notorious for causing severe metabolic disturbances in non-target species, like fish and fresh water mussels.

In fish blood acts as a medium for the traslocation of pesticides from the medium to different organs or system of an animal. In fish, the route of pesticide entry is either through gills or mouth, so into blood and subsequently to different organs or systems. Hence the impact of the pesticide can be well understood by analyzing either blood or serum.

Hematological values are widely used to determine systematic relationship and physiological adaptations, including the assessment of general health condition. The present investigation was aimed to analyze the effect of sublethal concentration ($1/5^{th}$ of LC50 value i.e. 1.2ppm) of pesticidal malathion on certain hematological paramenters like total count of Red Blood corpuscles (RBC) and White Blood Corpuscles (WBC) in the blood of the fish *Clarius batrachus*.

II. METHODS AND MATERIAL

Disease free fishes, *Labeo rohita* (7.5±1.7cm) and weight (8.2±0.5gm) were collected from a local river Godavari, were bathed in 0.1%KmNo4 solution and acclimatized under laboratory conditions for 15 days. They were kept in large glass aquarium of 100 liters capacity. During acclimatization period water was changed daily. The fishes were fed with standard laboratory diet (Trio). Commercial grade of malathion [0, 0-dimethyl, S (1, 2-dicarboethoxy ethyl) phodophorodithioale was used for this study. A small quantity of acetone was used for stock preparation,

which was further diluted to required concentration of 1.2ppm in water as suggested by APHA (1976).

Collection of blood :-

The blood was collected by cutting caudal peduncle using a sharp knife for hematological studies.

Total Erythrocyte Count :-

The number of erythrocytes per cubic millimetre of blood was calculated with the help of a hemocytometer using a Neubaur's counting chamber.

Total Leucocytes Count :-

The total W.B.C. count was done with Neubaur's hemocytometer.

Table 1- Level of Blood content in *Labeo rohita* exposed to sublethal concentration of malathion.

Sr. No	Blood parameters	Control	24 hrs	48 hrs	72 hrs	96 hrs
1	R.B.C. Count $1x10^6mm^3$	1.96±0.35	1.92±0.10	1.78±0.03***	1.64±0.04	1.53±0.05
2	R.B.C. Count $1x10^6mm^3$	3.19±0.08	3.10±0.09**	2.98±0.05	2.45±0.07	2.20±0.05*

[Values are mean ± SD of six replicates, * P<0.05, ** P < 0.01, *** P > 0.01, significant when student's test was applied between control and experimental groups]

III. RESULTS AND DISCUSSION

Results

Result showed many significant changes in the hematological parameters of *Labeo rohita* exposed to sub lethal concentration of malathion (Table-1). RBC count was significantly reduced from 2.57, 2.50, 2.45 and 2.37 ($1x10^6mm^3$) during 24, 48, 72 and 96 hours respectively as compared with control 2.68 ($1x10^6mm^3$). WBC count also showed reduction from 4.20, 4.10, 3.45 and 3.02 ($1x10^3mm^3$).

Discussion

The ppropriate percentage of R.B.C., W.B.C. in blood of animal indicate a good physiological status of animal. Any alteration due to stress, diseases or pollution affects the physiological, biochemical and behavioral activities of the living animals. Malathion induced significant decreases in erythrocyte count, leucocytes count of *Labeo rohita*.

Blood offers important profile to study the toxicological impact on animal tissues. Different blood parameters are often subjected to change depending upon stress condition and various other environmental factors .The significant decrease in RBC count in the present study might be due to haemolysis and shrinkage of blood cells by the toxic effect of insecticide. Mount observed erythropenia and leucopenia in the fish of Missisippi river induced by the organochlorine insecticide endrin poisoning. Shrivastava observed cellular and nuclear hypertrophy, change in shape, agglutination and bursting of erythrocytes in C. mrigala fingerlings treated with urea. Chakrabarty, Chauhan and Singh also observed in a similar findings in fish treated with pesticides and chemicals.

Annes (1978) reported decreased erythrocyte count and heamoglobin content in fresh water fish *Channa punctatus* after acute exposure of diazon an organophosphate pesticide. Changes in erythrocyte profile induced by acute affect of dichlorovos in *Clarius batrachus* were reported by Banarji and Rajendranath (1990). Khattak and Hafeez (1996) explained that malathion caused significant decrease in erythrocyte profile of *Cyprinion wabsoni*.

A reduction in leucocyte count was observed in C. punctatus after chronic exposure of freshwater teleosts to monotrophos (Singh et al., 1992). A significant decrease in leucocyte count due to the exposure of Cyprinus carpio to toxic environment of diazinon (Banaee et al., 2008) was reported. However,

a significant rise in leucocyte content was reported in C. punctatus due to toxic effects of malathion (Magar and Dube, 2012).

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