

## Impact of Malathion on Hematological Parameters of *Clarius* *Batrachus*

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**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 *Clarius batrachus*. The blood analysis showed significant decrease in RBC's and WBC's content of treated group compared with control.

**Keywords:** *Clarius batrachus*, Malathion, RBC, WBC, Blood

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### 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. *Clarius batrachus* (Family Claridae) is a common food fish in India.

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 studies have long been considered as a valuable diagnostic tool in clinical biochemistry, population, genetics and in medical anthropology. Malathion is a non systematic, wide spectrum organophosphorus insecticide. It was one of the earliest organophosphate 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.

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<sup>th</sup> 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. Material And Methods

Disease free fishes, *Clarius batrachus* (24±2cm) and weight (158±4 g) 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 *Clarius batrachus* exposed to sublethal concentration of malathion.

Sr. No	Blood parameters	Control	24 hrs	48 hrs	72 hrs	96 hrs
1	R.B.C. Count $1 \times 10^6 \text{mm}^3$	2.68±0.38	2.57±0.05	2.50±0.03	2.45±0.04	2.37±0.05
2	R.B.C. Count $1 \times 10^6 \text{mm}^3$	4.57±0.08	4.20±0.06	4.10±0.02	3.45±0.07	3.02±0.01

[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. Result

Result showed many significant changes in the hematological parameters of *Clarius batrachus* exposed to sub lethal concentration of malathion (Table-1). RBC count was significantly reduced from 2.57, 2.50, 2.45 and 2.37 ( $1 \times 10^6 \text{mm}^3$ ) during 24, 48, 72 and 96 hours respectively as compared with control 2.68 ( $1 \times 10^6 \text{mm}^3$ ). WBC count also showed reduction from 4.20, 4.10, 3.45 and 3.02 ( $1 \times 10^3 \text{mm}^3$ ).

### IV. Discussion

The appropriate 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 *Clarius batrachus*.

In agreement with the present findings, significant decreases in WBC number was observed in goats treated with quinolphos suggested by Dikshith *et al.*, (1982). Lone and Javid (1976) also showed decreases in WBC count in *Clarius batrachus* exposed to malathion and methyl parathion.

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*.

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