STUDIES ON MALATHION TOXICITY EFFECT ON FRESH WATER FISH *Clarias Batrachus*

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ABSTRACT

The aim of the studies was to describe the Malathion toxicity on fresh water fish. This study is based upon the histological analysis of fresh water fish .The fresh water fishes were collected from a pond of Sundarpada area. The fishes were collected d in the morning time and were kept in a container that filled with water. They were examined in the CUTM laboratory. In this study, the fresh water fishes are *Clarias batrachus* used for the experiment.

Key words: Malathion, Histology, toxicity

INTRODUCTION

Fishes are the members of Animal kingdom and the starting stages of vertebrate. They have notochord, paired gills and nerve chord. Fishes are very sensitive to the change in their aquatic environment. For this reason they are known as Bio-indicator species to monitor the water pollution (Deka *et al.*, 2016). When the organophosphate is exposed to these aquatic organisms develop toxicity. Toxicant affects both metabolic and physiological activities upon the organisms. Hence, it is essential to study the Histology (Begum *et al*., 2015). Malathion is one of the organophosphate. In the low concentration, it harms fishes. The toxicityis termed as the lethal concentration (Subhuraj *et al.*, 2017). Organophosphate can inhibit the acetylcholine esterase for which oxidative stress can be induced (Hai *et al*., 1995). When the concentration of organophosphate will be more it will lead to bioaccumulation and can enter to the food chain which causes the harmful effect to human beings (Islam, Haque *et al.*, 2019).

MATERIALS AND METHODS

STUDY AREA

In the present study the total number (N=4) of specimen were collected from a pond of Sundarpada near Old Town Bhubaneswar.

SAMPLE COLLECTION

They were kept in a plastic container filled with water and transported to CUTM laboratory for further examination.

METHODOLOGY

To analyze the toxicity level, low concentration of Malathion was given to the Fish. The Fish was died within two hours after given toxicant. Though the toxicity is accumulated by the skin very soon, thus the skin was removed from died specimen by using the forceps and knife. Then, that piece of skin was placed in theBouin's fluid for the stabilization of the tissue. After two days of stabilization, that piece of skin was used for the Microtomy to extract the tissue. After getting it, observed in the Microscope.

RESULTS

Figure-1 Image of *Clarias Batrachus*

Figure-2 Malathion Solution

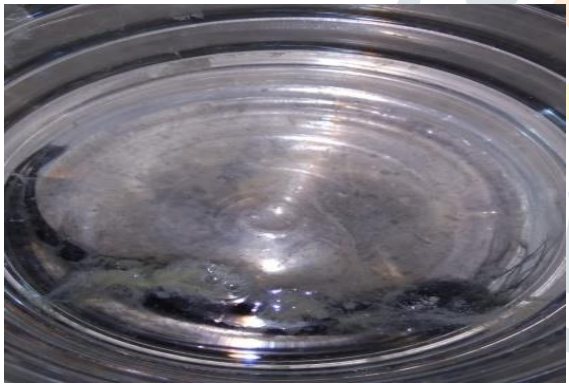

Figure-3 Treated Fish

Figure-4Placed in the bouin's fluid

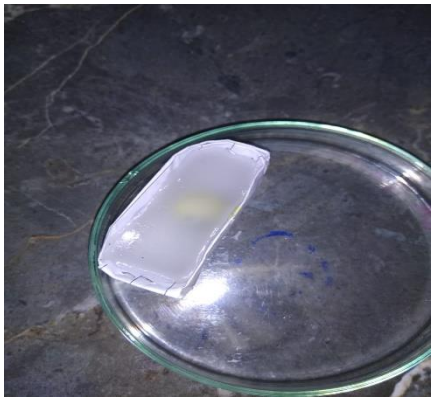

Figure-5 Paraffin Block

Figure- 6 Block for Tissue Sectioning

Figure-7 Microtomy

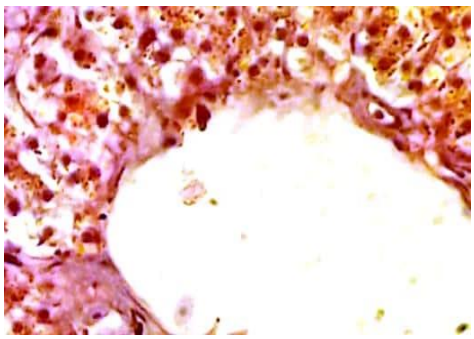

Figure-8 Vascularized Cytoplasm of the skin tissue

Here 2 Ltr of Water, the variation of Malathion (in ml) w.r.to time (hours) is shown

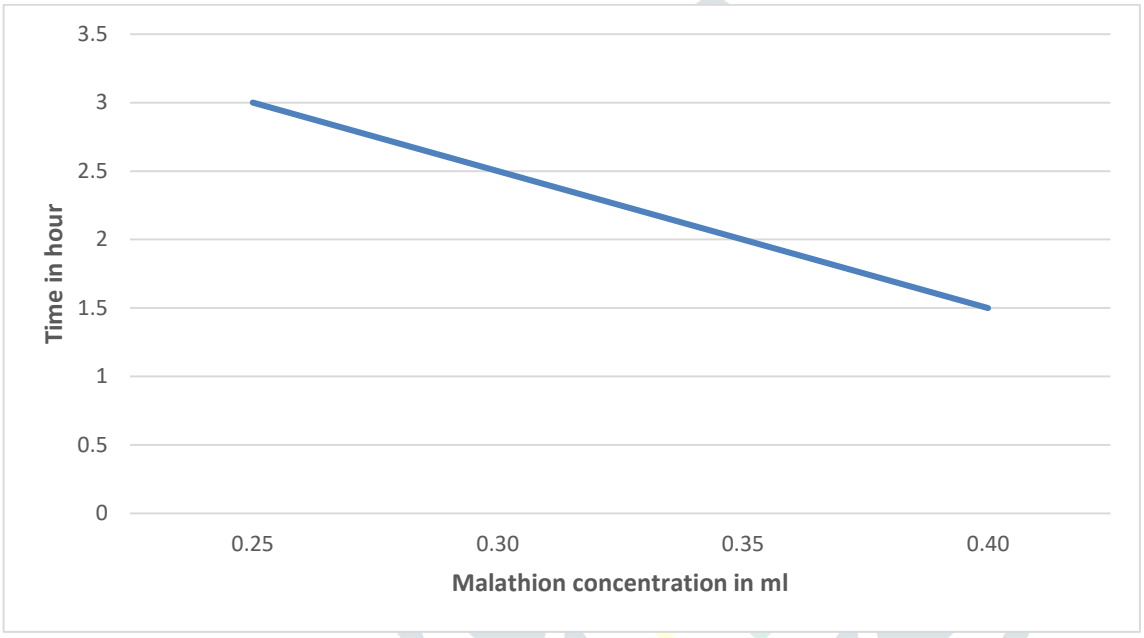

Figure-9 showing graph has negative slope so we conclude that when the toxicity label is increased, the death timing of the fish will be decreased.

The mortality rate depends upon the doses of toxicity. When the Malathion solution was given to *Clarias batrachus*, it just opened their operculum and tried to move towards the surface of the water to overcome the toxic situation. After giving the Malathion, it died within 2 hours. The body was total covered by mucous. In the histological studies, it was seen that the vacuoles are formed in the cytoplasm. The epithelial tissue was ruptured and the colour of the blood was changed into black.

DISCUSSION

Begum *et al*., (2015) studies on organophosphate pesticide, Malathion 50% on the liver of air breathing fish, *Heteropneustes fossilis*. They concluded that different concentration of Malathion can cause Histological damage to the fish. Though the liver is main organ and largest gland that secret enzymes for the digestion and detoxify the body, can affected by theorganophosphate in the fish. Deka *et al., (*2016) studied on Malathion toxicity on fish. They concluded that when the Malathion concentration is given to a fish, the respiratory epithelium, secondary lamellae get fused. Islam, Haque *et al., (*2019) studied the toxicity of Malathion to the

fish *Channa punctatus, Heteropneustes fossilis* and *Anabas testudineus.*It is concluded that the mortality rate of a fish is depended upon different concentration of Malathion. These doses cause lethality to the species. Yogesh, Wasu *et al., (*2009) studied on sub lethal and Chronic effect of Carbaryl and Malathion on *Clarius Batrachus.* They concluded that Malathion and Carbaryl are quick toxicant. They are strictly banned to prevent from the bioaccumulation. Halappa, David *et al., (*2009) studied the behavioral response of fresh water fish, *Cyprinus Carpio* followingsublethal exposure to Chlorpyifos. They concluded that Chlorpyifos is a toxic that had a deleterious effect to the behavioral response. This toxic will decrease the response towards the environmental stimulus. Reboke*t al., (*2017) studied on effect of heavy metal pollution on pigmented macrophages in kidney of Vardar chub (*Squalius vardarensis).* They concluded that heavy metals are the main reason for environmental pollution. Macrophages in the kidney of a fish can be used as the biomarker. Ahmad, Qureshi *et al.,* (2011) studied on effect of Cadmium Chloride on Histoarchitecture of Liver and kidney of a freshwater Catfish, *Clarias batrachus.* They concluded that when a fish expose to the toxic substances like Cadmium Chloride, the metabolic and physiological function of liver and kidney should be affected and may cause deleterious effect to the health of a fish.

CONCLUSION

The present study highlighted that the lethal toxicity that are getting from organophosphate like Malathion, can change the fish's behavior towards the external environment as well as many histological changes are seen in the body of the fish. Hence, it may accumulate this toxicity and can affect the food chain. These disturbances may alternate the biological environment.

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