

Acute Alterations of Herbicide Pursuit on Histochemistry of Protein in Liver of Oreochromis Mossambicus Fingerlings

Abstract

The histochemical reaction of bromophenol blue test for protein in the liver of Oreochromis mossambicus fingerlings under control and treated conditions gave different response. Rich amount of protein content were seen in liver of controlled fingerlings where as due to acute exposure of three different sublethal concentration (63.7 ppm, 85.0 ppm., 127.5 ppm.) of pursuit for 96 hrs. liver tissue shows weak positive to negative reaction with protein contents.

Keywords: Histochemical, Alterations, Liver, Pursuit Fingerlings, Protein, Acute-effect.

Introduction

Pesticide which have been classified in various ways, amongst which herbicides are a class which specifically target to destroy weeds. These herbicides are widely used in the field of agriculture for control of annual weeds to get maximum yield of crops. Hence Pesticide toxicity is a serious problem for any water body which may cause degradation of water quality and effecting the organic life of that Aquatic organisms are susceptible to pollution by pesticide.

The test herbicide "Pursuit" falls in the category of carbamate extensively used for the control of weeds in soyabean and groundnut crops. In aquatic toxicology fish has been widely used as a biological indicator of the degree of pollution and acclaimed as test species to test the potency of toxicants. It can be more specifically measured on fingerlings of fishes rather than adult ones as they are immature adult forms in its outward appearance, having undeveloped reproductive organs and delicate organ system. Hence they are more sensitive towards any environmental changes. Considering the recent trends in the field of fishery the present work has been carried out on acute alterations of herbicide pursuit on histochemistry of protein in liver of Oreochromis mossambicus fingerlings.

Aim of the Study

The indiscriminate use of pesticides has posed grave environmental problems as a result of contamination of various water bodies, thereby adversely affecting the aquatic fauna.

Material & Method

Fingerlings of Oreochromis mossambicus were collected from local fish farm and kept in the glass aquaria for acclimatization for 15 days. After obtaining the LC₅₀ value fingerlings were exposed to 63.0 ppm., 85.0 ppm., 127.5 ppm. concentration of herbicide pursuit for 96 hrs. controls were maintained separately for same duration. After specific duration (96 hours) fishes were dissected out and liver was removed and washed with saline water. For staining general protein in the tissue mercuric bromophenol blue test was followed.

Result & Discussion

In the liver of untreated fingerlings nuclei of the hepatic and pancreatic cells were strongly positive with bromophenol blue test cytoplasm and its reserve material was found in strong positive condition. Blood cells and interhepatic spaces were shown positive for the bromophenol blue stain (fig. 1). When the fingerlings were exposed with the 63.7 ppm. pursuit for 96 hrs. no remarkable changes were observed. Only cytoplasm and outer capsular layer of liver cells were moderate positive to this test (fig. 2). With the 85.0 ppm. pursuit intoxication moderate positive reaction was noticed in blood capillaries, hepatic cell cytoplasm as well as blood cells show positive reaction towards this test. (fig. 3). After 127.5 ppm. pursuit toxicity nuclei of the hepatic cells and blood cells were weak positive to this test. Boundaries of the liver cells



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show negative reaction due to clumping. Interhepatic space shows weak positive reaction (fig. 4).

Palanchamy, et.al. (1989); suggested that the body components such as carbohydrate and protein of liver decrease with increasing concentration of chemical effluents in *Mystus*. Govindan, et.al. (1994) :also determined that total carbohydrate and protein contents in liver of *Gambusia* largely decreased when the fish was exposed to phosphamidon. In the present study with increase in the concentration of pesticide protein contents decrease gradually as the fingerlings were exposed with 63.7 ppm., 85.0 ppm. pursuit for 96 hrs. much more depletion of protein contents were visible after acute exposure of 127.5 ppm. of the pursuit. These findings were similar to the findings of Hinilica and Johns (1962); Eister & Edmunds (1996), Bhaskar (1997), Kasotia & Vyas (2004); as they have also reported depletion in the protein contents due to the intoxication of different pesticides. Tilak et.al. (2003), Mahrotra et.al. (2004); also observed decreases in protein contents as exposure was increased.

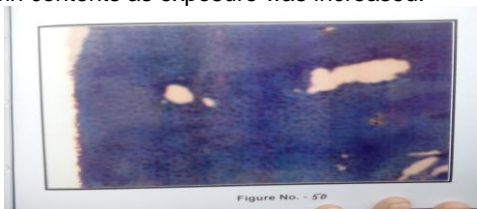


Fig. 1: Photomicrograph of T.S. of Liver of Control *O. mossambicus* fingerlings with Bromophenol Blue Stain X150

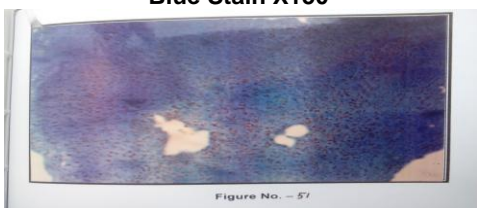


Fig. 2: Photomicrograph of T.S. of Liver of *O. mossambicus* fingerlings after 96 hrs. exposure of 63.7 ppm. pursuit with Bromophenol Blue Stain X150.



Fig. 3 : Photomicrograph of T.S. of Liver of *O. mossambicus* fingerlings after 96 hrs. exposure of 85.0 ppm. pursuit with Bromophenol Blue Stain X150.

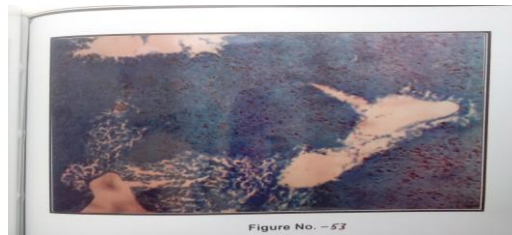


Fig. 4: Photomicrograph of T.S. of Liver of *O. mossambicus* fingerlings after 96 hrs. exposure of 127.5 ppm. pursuit with Bromophenol Blue Stain X150.

Conclusion

The indiscriminate use of pesticides has posed grave environmental problems as a result of contamination of various water bodies, thereby adversely affecting the aquatic fauna. So the present study therefore intends to highlight the histochemical changes induced by sublethal doses of herbicide pursuit in the liver of *O. mossambicus* fingerlings.

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