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Original Research Article

EFFECT OF MEOTHRIN ON TISSUE GLYCOGEN CONTENT IN THE FRESH WATER FISH *Nemacheilus botia*

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Abstract

Changes in the glycogen content of the liver, muscle and gonads of the laboratory acclimatized fish *Nemacheilus botia* exposed to Meothrin was studied. Estimations were made after 24 hrs, 48 hrs, 72 hrs and 96 hrs and 10 days, 20 days and 30 days. The lethal concentrations were obtained at 0.040 ppm (24hrs Lc50), 0.038 ppm (48 hrs Lc50), 0.037 ppm (72 hrs Lc50) and 0.033 ppm (96 hrs Lc50) for Meothrin. But 1/10 of 48 hrs of Lc50 value is 0.0038 ppm glycogen content of all tissues were decreased. The processes of glycolysis in all tissues were maximum. The glycogen loss in the liver, muscle and gonads might be due to the toxic action of the pesticide Meothrin on tissue energy level.

Keywords: Meothrin, Pesticide, *Nemacheilus botia*

Introduction

The profuse use of organophosphate pesticides has contaminated water bodies which cause untold hazard of considerable magnitude especially to non target species. The fatal effect of the pesticides on the non target animal particularly on it's physiological and biochemical parameters are witnessed in the toxicological studies and recent research methodology. Several attempts have also been made to evaluate their toxicological effect on the fishes. Tissue glycogen content has been studied by many workers in the fishes exposed to different pesticides. Some of the workers reported that the organphosphate pesticides were most toxic as they produced significant reduction in glycogen content of liver, muscles and gonads. The alteration in the toxic action of the pesticides. The mode of the action of each pesticide is specific species, as the detoxification power is different in animal to encounter the toxic effects. Keeping this fact in view, the present study is framed to evaluate the toxic effects of Meothrin on the tissue glycogen content of the fish Nemacheilus botia which has rich nutritive value.

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Material and Methods

The fish, Nemacheilus botia were collected from Girna dam near Malegaon, (Nashik), kept in laboratory condition for 4-5 days and food were feed daily. A batch of 10 fishes (3-4 cms. In length and 5-10 gms. Weight) were exposed to 1/10 of 48hrs Lc50

value i.e 0.0038 ppm were exposed as eight batches out of eight one batch treated as control and seven batches as 24hrs, 48hrs, 72hrs and 96hrs, 10days, 20days and 30days. Food was stopped before 24hrs of experimentation, then they were feed alternate days. The physic-chemical characteristic of water were determined according to APHA (pH 7.2, temp. 29.5, dissolved oxygen 4.8, dissolved solids 4.58 and hardness 4.6 mg/l.) and glycogen was estimated by using Kemp et al., 1954 method from liver, muscle and gonads.

Result and Discussion

The fishes after exposure to the pesticide Meothrin for 24hrs, 48hrs, 72hrs and 96hrs, 10days, 20days and 30days exhibited the sign of distress visible sign of poisoning were manifested with irregular movements. Meothrin intoxication produced a number of changes in the glycogen content of liver, muscles and gonads recorded in Table- 1.

Table- 1: Effect of 1/10 of 48hrs Lc500, 0038 ppm of Meothrin on tissue glycogen in the fish *Nemacheilus botia*

Tissue	Control	24hrs	48hrs	72hrs	96hrs	10days	20days	30days
Liver	0.7246 ±0.0212	0.7124 ±0.0121	0.7112 ±0.0123	0.7101 ±0.0271	0.7092 ±0.0024	0.7056 ±0.0118	0.7004 ±0.0236	0.6154 ±0.0118
Muscle	0.1777 ±0.0062	0.1762 ±0.0098	0.1738 ±0.0059	0.1702 ±0.0088	0.1701 ±0.0047	0.1684 ±0.0031	0.1675 ±0.0139	0.1654 ±0.0054
Testis	0.1572 ±0.0139	0.1569 ±0.0068	0.1560 ±0.0031	0.1558 ±0.0130	0.1540 ±0.0092	0.1501 ±0.0132	0.1498 ±0.0078	0.1490 ±0.0198
Ovary	0.1472 ±0.0097	0.1470 ±0.0072	0.1450 ±0.0047	0.1442 ±0.0073	0.1420 ±0.0139	0.1405 ±0.0141	0.1382 ±0.0101	0.1370 ±0.0098

The glycogen content in all the tissues decline in *Nemacheilus botia* on exposure to Meothrin. In the present study when the fish Nemacheilus botia exposed to Meothrin glycogen content was significantly droped down, this declination may be due to the toxic action on the tissue and stored glycogen from liver was utilized to counter act the pesticidal stress. Similar results have been observed by Khillare and Wagh (1987) reported effect of dimethoate and lindane on tissue glycogen content in fresh water fish Channa gachua. Kharat et al., (2009) reported effect of TDTL on glycogen profile in fresh water prawn Macrobranchium kistensis. Lomate and Mule (1990) suggested effect of rogar on glycogen content of fresh water snail, Melenoides tubercultus. Ahirrao et al., (2004) reported effect of sevin on protein and amino acid contents of a fresh water snail Thiara lineate. Babu et al., (1988) glycolytic oxidation in fresh water fish Tilapia mossambicus during benthiocarp exposure. Biochemical adaptive responses in energy metabolism of fish under ambient ammonia stress, suggested by Begum et al., (1982). Ghosh (1986) effect of chromium on branchial glycolysis of fresh water fish Tilapia mossambica. Sharma and Sastry (1979) alterations in enzyme activities in liver and kidney of Channa punctatus exposed to endrin. The dropping down of liver glycogen in the fishes due to pesticidal stress was suggestive of the metabolisation of glycogen from the liver to the other tissues suggested by Ramaswamy (1983). Whereas the glycogen store was advantageous for energy release in any animal on immediate demand. In the present tissue glycogen contents were found depleted due to the body entered toxic substances damaged and weakened the mechanism concerned which in turn resulted in the failure of routine metabolism processes. Thus the results from present study are similar to findings of various workers.

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