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Toxicity of Endosulfan on Total Lipid Contents of Liver, Kidney, Testis and Ovary of the Fish *Channa punctatus* (Bloch.)

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ABSTRACT

The present study includes toxicity effect of endosulfan, induced by chronic (30 days) exposure on the fish Channa punctatus, with a sublethal concentration on the total lipid content in the liver, kidney, testis and ovary. The results showed that the sublethal exposure of endosulfan was highly toxic to the fish Channa punctatus.

Keywords: ***Endosulfan, Channa punctatus, Sublethal concentration, Lipid contents.***

INTRODUCTION

In our modern agricultural practices, various pesticides and agrochemicals are being applied by farmers which ultimately contribute to massive loss to our aquatic ecosystem including massive fish 'die offs'. The main use of pesticides in India is for cotton crops (45%) followed by paddy, wheat, fruits and house hold purposes. Available literature demonstrates that different fish species, then from the same family showed differences to the sensitivity to high concentrations of insecticides in water. Acute toxicity of different insecticides is influenced by the age, sex, genetic properties and big size of fish, meter quality and its physiological parameters and purity and formulations of insecticides.

MATERIALS AND METHODS

The total lipid extraction was done by following the method as described[1]. The tissues of undertaken organs were homogenized with chloroform and methanol (2:1) to a final volume 20 times the volume of the tissue sample (1 gm., in 20 ml. of solvent mixture). After dispersion, the whole mixture was agitated during 15-20 minute in a orbital shaker at room temperature. The homogenate was centrifused to become the liquid phase. The solvent was washed with 0.2 Volume (4 ml. for 20 ml.) of water. After vortexing some seconds, the mixture was centrifuger at 2000 rpm to separate the two phases. Removed the upper phase by siphoning and kept it to analyze small polar molecules. The interface was rinsed two times methanol. Water (1/1) without mixing the whole preparation. After centrifugation and siphoning under vacuum in a rotary evaporation to obtain volume under 2-3 ml. finally the total lipid was measured.

RESULTS AND DISCUSSION

The estimation of total lipid was recorded significantly decreases under the experimental concentration and duration of endosulfan, and was recorded to be 15.40± 0.56 mg/g. in liver, 18.49 ±0.83 mg/g in kidney, 12.54± 0.77 mg/g in testes and 16.05 ± 0.66 mg/g in ovary.

Table 1

Effect of endosulfan (0.01 ppm conc.) on total lipid in wet tissue content of liver, kidney, testis and ovary of the test fish *Channa punctatus* after 30 days treatment.

Parameters	Control	Endosulfan
Liver	28.10±1.56	15.40±0.56
Kidney	20.68±1.17	18.49±0.83
Testis	16.74±0.72	12.54±0.77
Ovary	21.19±0.97	16.05±0.66

Values are mean ± SE of 5 observations, Significant level = P< 0.05

The test fish *Channa punctatus*when exposed to sublethal concentration of endosulfan for 30 days, significant decrease in total lipid content in the tissue of all the four organs were recorded (Table 1) in comparison to control fish. Similar decrease in lipid content was also reported,[2-5] on stress condition in their preferred fished as mentioned above, which confirmed the present findings. The result of the present work is in unison with the result in *Catla catla* and *Labeo rohita*[6]. On the other side some scientists also reported decreased protein in *Channa punctatus* under pesticide exposer in the present work, the kidney tissue lipid was observed decrease when *Channa punctatus* was exposed to endosulfan[7,8]. Similar reports reported decrease in lipid content and depletion in lipid level of *Channa punctatus* under pesticide stress[9,10]. The decrease might have occurred mainly due to altered lipid metabolism and energy demand in fishes under stress of toxicants.

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