

# Comparative Study of Toxicity of Endosulphan on some locally available fishes in Ashti region.

Nimgare SS<sup>1</sup>, Fule UW<sup>2</sup> and Telkhade VP<sup>3</sup>

<sup>1,2</sup> Dept. of Zoology, Hutatma Rashtriya Arts and Science College, Ashti, Dist. Wardha.

<sup>3</sup>Kala Vanija Mahila Mahavidyalya Ballarpur, Chandrapur,

Email : [patankar.kargi@gmail.com](mailto:patankar.kargi@gmail.com)

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## ABSTRACT

An attempt was made to study the acute toxicity of endosulphan to some locally available freshwater edible fishes found in Ashti region. The Lc50 of 96hre in *Channa punctatus*, *Channa striatus*, *Cyprinu scarpio*, *Cirrhinu smrigal*, *Claria sbatracus*, *Catla catla* and *Labeo rohita* were found to be 0.0038ppm, 0.0035ppm, 0.0034ppm, 0.0033ppm, 0.0032ppm, 0.0031ppm, 0.0030ppm respectively. In the present study *Channa punctatus* was found to be most tolerant in polluted environment.

**Keywords:** : Comparative study, Toxicity, Endosulphan, Fishes and Ashti.

## INTRODUCTION

Pollution means addition of any foreign material in excess or any physical change in the natural water, which may harmfully affect living organisms directly or indirectly, immediately or after some times or after a very long time.

The major sources of pollution are the rivers and canals flowing near villages. Industries pollute the rivers flowing in cities. Pollutants like oil, soap, detergents, effluents and city wastes have disturbed the vegetation and animal life in ponds, rivers, seas etc.

Water bodies are polluted every day, every hour and the problem is increasing day by day. Domestic wastes and industrial wastes pollute the water.

In pest control operations, pesticides are used which results the pollution of the environment. Use of pesticides in intensive fish culture is very common. Organochlorine and Organophosphate pesticides are commonly used for the control of weeds and predatory fishes. Massive fish kills are also observed after the application of pesticides. Pesticides used for the control of malaria and filaria endanger fish culture. The toxicity of endosulphan is studied by several workers on marine and freshwater fishes.[1] The combined effects of other insecticides were also studied by Deneer [2], Jha and Verma[3] and Nair *et al.*[4]

Ashti Tahsil is located in Wardha District and is surrounded by rivers and lakes. Varieties of fishes occur abundantly in the water bodies in this region. Use of pesticides is also common in this area and endosulphan is extensively used in this area to control Cotton pests. So present study is carried out on Toxicity of endosulphan pesticide in some locally available fishes in Ashti region.

## METHODOLOGY

The locally available fishes such as *Channa punctatus*, *Channa striatus*, *Cyprinu scarpio*, *Cirrhinus mrigal*, *Clarias batracus*, *Catla catla* and *Labeo rohita* were collected from Kapileshwar lake in Ashti Tahsil . After disinfecting them with 0.1%  $KmnO_4$  they were acclimatized and maintained under laboratory conditions in a glass aquarium for one week. The fishes were fed with earthworms during acclimatization period.

Throughout the experiment the tap water was used and physico-chemical parameters were determined as per standard methods[5] and are shown in Table 1. The pesticide endosulphan was used for the present investigation. The toxicity tests to calculate  $Lc_{50}$  for 96 hrs.process is carried out by desired concentration of endosulphan prepared by adding the stock solution (100 ml.) of the pesticide in acetone. The pilot tests were perform for the selection of test concentration. On the basis of the results of pilot tests series of different concentration grade were prepared. The  $Lc_{50}$  values for 24hrs, 48h, 72hrs and 96hrs were determined by the method of probit analysis.[6]

## RESULTS AND DISCUSSION

The  $Lc_{50}$  values of endosulphan toxicity to different fish species such as *Channa punctatus*, *Channa striatus*, *Cyprinu scarpio*, *Cirrhinus mrigal*, *Clarias batracus*, *Catla catla* and *Labeo rohita* were found to be 0.0038ppm, 0.0035ppm, 0.0034ppm, 0.0033ppm, 0.0032ppm, 0.0031ppm, 0.0030ppm respectively. While  $Lc_{50}$  values for 24hrs, 48h , 72hrs and 96hrs to different fish species such as *Channa punctatus*, *Chann astriatus*, *Cyprinu scarpio*, *Cirrhinus mrigal*, *Clarias batracus*, *Catla catla* and *Labeo rohita* are shown in Table-2.

Many workers carried out the experiments to asses the acute toxicity of various pesticides to different fishes. The results of the present study on acute toxicity are compared with the available literature by Mercy *et al.*[7], Dixit *et al.*[8], Chandrashekharan *et al.*[9] and Charjan *et al.*[10]

**Table-1** : Physical & Chemical parameters of water used for toxicity test.

Sr. No.	Parameters	
1	Temperature	22 OC ( 21-24OC)
2	Acidity	4.5 ppm
3	Alkalinity	26.1ppm
4	Total hardness	60 ppm
5	Dissolved Oxygen	5.2 ppm
6	pH	7.7
7	Weight of the fish	50 gm
8	Length of the fish	17cm

**Table-2:** Toxicity of Endosulphan Pesticide to various fish species of Ashti region.

Sr.No.	Fish species	LC50 Value (ppm)			
		24 hrs	48 hrs	72 hrs	96 hrs
1	<i>Channa punctatus</i>	0.0049	0.0044	0.0041	0.0038
2	<i>Channa striatus</i>	0.0045	0.0041	0.0037	0.0035
3	<i>Cyprinus carpio</i>	0.0042	0.0040	0.0038	0.0034
4	<i>Cirrhinus mrigal</i>	0.0041	0.0039	0.0036	0.0033
5	<i>Clarias batracus</i>	0.0040	0.0037	0.0035	0.0032
6	<i>Catla catla</i>	0.0037	0.0035	0.0033	0.0031
7	<i>Labeo rohita</i>	0.0036	0.0034	0.0032	0.0030

All these studies show that the toxicity of pesticides to fish is dose dependent. Mortality depends on the concentration and duration of exposure. It also reveals that different fishes have different tolerance capacity against toxic effects of same pesticide and toxicity of different pesticides varies among the same species depending on size, physico-chemical parameters and density in terms of numbers of specimens used.

## CONCLUSION

The general conclusion, which can be drawn from the present investigation is *Channapunctatus* was most tolerant to endosulphan as compared to other experimental fish species.

**Conflicts of interest:** The authors stated that no conflicts of interest.

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