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Influence of Pesticide Decis on Hematology of Air-Breathing Fish *Channa punctatus* (Bloch.)

RABINDRA NATH

Hematology Laboratory, Department of Zoology, Patna Science College Patna University Patna 800005, India

Abstract

In the present study the variation in hematological parameters of freshwater fish *Channa punctatus* on exposure to lethal 96h LC_{50} and sublethal concentration of decis (organophosphorus) for 48, 72, 96 and 120 h were observed. The pesticide decis caused significant decrease in TEC, Hb and PCV% in exposure of 96 h and LC_{50} and 48h of sublethal concentration while at 72, 96 and 120 h of treatment the values were found to be significantly increased in exposed fish.

Key words : Pesticide, Decis, Hematology, *Channa punctatus*

The pesticide pollution is one of the major factors that reduces the growth rate of fishes by affecting blood. There are some reports on blood parameters of fish due to pesticides (Chatterjee and Ganguli 1993, Mishra 1993). It is important to study the influence of pesticides on the blood of fresh water fishes which are sensitive and reliable indicators for monitoring various diseases and health management of fish. The present work was undertaken to analyze the toxicity of pesticides decis on different blood parameters on exposure to lethal 96 h LC_{50} and sublethal concentration at intervals of 48, 72, 96 and 120 h in fresh water fish *Channa punctatus.*

Methods

The experiemental fish Channa punctatus (length 17- 23cm and weight 55-77g) were obtained from fish market and acclimatized to the laboratory conditions. The fish were pretreated with methylene blue (0.5%) for disinfection. They were fed daily with pieces of goat liver. The water in the aquaria was changed after 24 h and analyzed for temperature 29 ± 20 pH 7.5 ± 0.2 and DO 6.2 ppm. The value of lethal exposure (96h LC_{50}) of decis 2.8 EC was found to be 0.008 ml/liter determined by probit analysis (finney 1971) and sublethal concentration was derived by dividing this value by 3 (Natarajan 1984) in which there was no mortality. The fish were kept at this concentration in seperate glass aquaria for 48, 72, 96 and 120 h. Blood was collected from caudal peduncle region and TEC, Hb and PCV% were determined by hematological method (Yadav and Banerjee 1985). Statistical significance was evaluated at $P<0.05$, $P<0.01$, $P<0.001$.

Results and Discussion

The values of hematological parameters of Channa punctatus on exposure to 96 h LC_{50} and sub-

Table 1. Toxicity of lethal exposure (196 h LC_{50}) of decis on the blood parameters in Channa punctatus. All values are mean ±SE Significant at $P<0.05$ (*) ; $P<0.01$ (**); $P<0.001$ (***).

Experimental duration	TEC ($X10^6/mm^3$) Control	Treated	Hb (g/100ml) Control	Treated	PCV (%) Control	Treated
96 h LC_{50}	3.48 ± 0.04	3.23 ± 0.06	14.22 ±0.39	12.90 ± 0.30	30.74 ± 0.41	28.78 ± 0.38
Percent change	-7.18**			-9.28*		-6.37**
	MCV (μm^3) Control	Treated	MCH (pg) Control	Treated	MCHC (%) Control	Treated
96 h LC_{50}	8.82±0.06	8.93 ± 0.29	4.17 ± 0.04	4.05 ± 0.10	47.29 ±0.67	44.84 ± 1.16
Percent change	+1.24			-2.87		-5.18

Table 2. Effect of sublethal toxicity of decis on different exposure period in blood parameters of the fish *Channa punctatus* (L). Values are significant at $P<0.05$ (*), $P<0.01$ (**), $P<0.001$ (***).

Experimental duration	TEC ($X10^6/mm^3$) Control	Treated	Hb (g/100ml) Control	Treated	PCV (%) Control	Treated
48h	3.61	3.34	15.26	13.64	35.50	31.10
Change (%)		-7.47***		-10.61**		-12.39***
72 h	3.26	3.54	13.10	14.76	29.44	32.70
Change (%)		+ 8.58***		+12.67**		+11.07***
96 h	2.92	3.15	11.70	12.68	25.26	27.32
Change (%)		+ 7.87**		+ 8.37*		+ 8.15**
120 h	2.86	3.11	11.04	12.16	21.12	24.66
Change (%)		+ 6.74**		+ 10.14*		+16.76***

lethal concentrations of decis for 48, 72, 96 and 120 hours are given in Tables 1 and 2. In 96 h LC_{50} exposure Channa punctatus showed decrease in TEC, Hb and PCV % along with absolute values of MCH and MCHC but MCVwas increased as compared to control. The decrease in TEC and related parameters have been reported on lethal exposure to BHC(Kumar and Banerjee 1991), Metacid (Kumari and Yadav 1989) Metasystox (Natarejan 1981) in blood of different fish species.

In sublethal exposure for there was significant decrease in TEC, Hb and PCV % indicating that may be anemic condition and reduction of oxygen consumption rate in exposed fish as also reported in *Clarias batrachus* due to exposure of carbaryl and phorate (Jyoti and Narayan 1993).

However, after 72, 96, and 120 hour sublethal exposure of decis the significantly increase of these parameters of the blood of channa punctatus was observed (Table 2) as was observed in *Amphipnous cuchia* after 24, 48 and 72 h sublethal exposure to aldrin and carbaryl (Ahmed and Ahsan 1989).

Thus the results indicate that blood of fish *Channa punctatus* may be one of the indicators for diagnosis of fish disease to assess the pollution due to pesticides.

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