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EFFECT OF SUBLETHAL CONCENTRATION OF DIMECRON (ORGANOPHOSPHATE) ON TOTAL PROTEIN AND TOTAL AMINO ACID CONTENT IN OVARIES OF FRESHWATER FISHES *BARLIUS BENDELISIS* AND *BARLIUS BURNA*

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ABSTRACT
The total protein and total amino acid content of ovaries were studied in the freshwater fish; *Barilius bendelisis* and *Barilius burna* exposure to various sublethal concentrations of Dimecron (0.0064%, 0.0128%, 0.0192 and 0.0075%, 0.015%, 0.0225%) respectively for different time periods up to 96 hrs. All the concentrations of Dimecron brought about a significantly decrease in total protein and total amino acid content. The results are discussed in relation to the concentration of the most commonly used pesticide in this region.

INTRODUCTION

The organophosphate, organochlorine and carbamates insecticides are extensively used in agricultural management for agricultural food production but through their excessive and indiscriminate use in agricultural pest management and public health operations to eradicate disease vectors are being translocated into aquatic ecosystem and frequent exposure to these pesticides. Now a days Dimecron an organophosphate pesticide is widely used in controlling agricultural pests and as such likely to make their way through runoff from agricultural lands drift from aerial and land applications to near by water bodies. These pesticides pose a critical stress on the non-target aquatic biota like Fishes; Crustaceans; Molluscans and other aquatic animals, which are economically important as a food Sahaj and Chauhan (1977). Numbers of workers have concentrated on the vital aspect of toxicity of residual pesticides on physiology of a number of aquatic animals Kleerkoper (1974), Shiva Prasad Rao *et al.,* (1981) have study the effect of methyl parathion on tissue proteins and excretory products of the snail; *Pila globosa*.

The organophosphate Dimecron is highly toxic and extensively used in this part of Marathwada. A little information is known about the effects pesticides on the tissue physiology of fishes and other aquatic animals. The present study was undertaken to study the effect of Dimecron an organophosphate pesticide on total protein and total free amino acids contents in ovaries of freshwater fishes; *Barilius bendelisis* and *Barlius burna*.

MATERIALS AND METHODS

The freshwater fishes like; *Barilius bendelisis* and *Barlius burna* were collected from river Godavari near Nanded city and were acclimated to the laboratory condition for about 15 days and were feed with planktonic materials and other food during the period of acclimation, water was replaced daily after feeding. The fishes were starved for 24 hr before exposure to avoid nutritional effects. LC_{50} was determined before under taking the present investigations. The fishes; *Barilius bendelisis* and *Barlius burna* of approximately same size and weight (10 to 12 and 4 to 5.5g) were exposed to the sublethal concentrations of the 96 hr LC_{50} (0.0064%; 0.0128%; 0.0192% and 0.0075%; 0.0150%; 0.0225%) of the pesticide Dimecron for raring time periods 24; 48; 72; 96 hr. After each exposure periods total protein and total free amino acids content in the ovaries were estimated by employing the method of Biurite; Chaykin, (1970) and the modified method of Danielson; Harold (1958). The data statistically analyses by performing student 't' test.

RESULTS AND DISCUSSION

The total proteins and total free amino acids contents in ovaries

of freshwater fishes; *Barilius bendelisis* and *Barlius burna* were found to decrease in all sublethal concentration of Dimecron and different time period of exposure have been presented in Table 1 to 4.

Table 1: Effects of Sublethal concentration of Dimecron on total protein content (mg/g wet weight of tissue) in ovaries of freshwater fish; *Barilius bendelisis* is the average of 6 observations ± S.D.

Hours	Control	% Dimecron Sublethal Concentrations		
		0.0064	0.0128	0.0192
24	49.53 ± 3.29	47.33**	43.07*b	36.33*a
48	44.07 ± 0.89	41.33**	37.13*b	33.63*a
72	43.03 ± 1.54	37.13*b	35.13*a	32.10*a
96	42.40 ± 1.72	35.07*b	27.67*a	20.60*a

** Insignificant; *a significant level significance p > 0.01; *b significant level significance p > 0.05

Table 2: Effects of Sublethal concentration of Dimecron on total amino acids content (mg/100 mL) in ovaries of freshwater fish; *Barilius bendelisis* is the average of 6 observation ± S.D.

Hours	Control	% Dimecron Sublethal Concentrations		
		0.0064	0.0128	0.0192
24	8.62 ± 0.22	8.12* ± 0.22	7.89** ± 1.55	7.45*
48	8.62 ± 0.21	7.89* ± 0.77	7.28* ± 0.27	6.1* ± 0.06
72	8.48 ± 0.65	7.4* ± 0.64	6.9* ± 0.34	5.4* ± 0.28
96	8.48 ± 0.65	7.35* ± 0.35	6.00** ± 0.26	4.88** ± 0.24

*non significant; ** significant p < 0.05

Table 3: Table 1 Effects of Sublethal concentration of Dimecron on total protein content (mg/g wet weight of tissue) in ovaries of freshwater fish; *Barilius burna* is the average of 6 observation ± S.D.

Hours	Control	% Dimecron Sublethal Concentrations		
		0.0064	0.0128	0.0192
24	44.67 ± 1.69	41.40*b	37.87*b	36.27*a
48	44.27 ± 1.42	39.73*b	35.87*a	34.37*a
72	43.03 ± 1.54	37.13*b	35.13*a	32.10*a
96	42.40 ± 1.72	32.13*b	26.80*b	21.40*a

*a significant level significance p > 0.01; *b significant level significance p > 0.05

The decrease in the total protein and the total free amino acid content in ovaries of freshwater fishes; *Barilius bendelisis* and *Barilius burna* were suggested the possible utilization of these compounds for metabolic purpose. The decrease in the total protein suggest the enhancement of proteolysis; which may in agreement with the higher level of digestive enzymes activity, while the decrease the total free amino acids might suggest the occurrences of transamination activity to meet the energy demands under Dimecron stress condition. The decrease total free amino acids contents in ovaries may be due to in ability of the tissue to accumulates the amino acids or utilization of

Table 4: Effects of Sublethal concentration of Dimecron on total free amino acids content (mg/100 mL) in ovaries of freshwater fish; *Barilius burna* is the average of 6 observation ± S.D.

Hours	Control	% Dimecron Sublethal Concentrations		
		0.0064	0.0128	0.0192
24	8.12 ± 1.12	7.89* ± 0.77	6.57** ± 0.36	5.72** ± 0.25
48	8.12 ± 1.12	6.59** ± 0.56	5.52** ± 0.57	4.85**
72	8.48 ± 0.65	6.57* ± 0.36	5.22** ± 0.39	4.85** ± 0.57
96	8.48 ± 0.65	5.45* ± 0.50	4.88** ± 0.24	4.07** ± 0.15

*non significant; ** significant

amino acids for the production of energy resulting information of nitrogenous waste products earlier studies showed the decrease in the total protein and total free amino acids contents when snail; *Pila globosa* exposed to methyl parathion. Shiva Prasad Rao *et al.,* (1981); Kamble *et al.,* (1984) showed and increase in total free amino acids contents in hepatopancreas, muscles and gills of freshwater crab; *Barytelphusa guerini* when exposed to sublethal concentration of Hilden an organochlorine pesticide. Kamble *et al.,* (2002) also showed that decrease in the total protein as well as free amino acids content in ovaries when the fishes; *Barilius bendelisis* and *Barilius burna* exposed to varying sublethal concentration of Dimecron durations between 24 to 96 hr.

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