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Impact of coragen pesticide on freshwater crab *Barytelphusa cunicularis*

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Abstract
Acute toxicity of pesticide coragen has been studied on freshwater crab *Barytelphusa cunicularis*. The LC 50 values were found to be 0.2612, 0.2280, 0.1650 and 0.1448 ppm for 24, 48, 72 and 96 hrs respectively. The highest LC 50 values were recorded after 24 hrs and lowest at 96 hrs exposure.

Keywords: Coragen; pesticide; freshwater; crab; *Barytelphusa cunicularis*.

Introduction

Environmental pollution resulting from various factors, particularly by the use of poisonous chemicals including pesticides, is matter of concern for us. In our country, the use of pesticides has been about 100,000 tonnes a year and areas of application cover both agriculture and public health. Though many workers have focussed the light towards the toxic effects of pesticides on freshwater and marine crustaceans, such as Manikumar (1986), Mary (1984), Deshpande (1986), Rao (1984), Martin (1990), Yadav (1991). But meagre literature is available on the toxicity of pesticide 'coragen' on the freshwater crustaceans. Therefore, the present work has been undetaken to observe the toxic effect of coragen pesticide on the freshwater crab *Barytelphusa cunicularis*.

Materials and Methods

The freshwater crabs *Barytelphusa cunicularis* were procured from Haranbari Dam near Taharabad, Nashik (India). The crabs were reared in plastic troughs containing tap water and acclimated to laboratory condition for 3-4 days prior to the commencement of the experiment. Crabs were fed with the pieces of earthworm and water was changed every alternate day. The physico-chemical characteristics of water such as pH-6.4, hardness 240 mg/litre and temperature 27^{o}C were recorded. The stock solution of pesticide 'coragen' was prepared by dissolving a known solution of pesticide in tap water and required concentrations were prepared from the stock. In this biostatic assay, mature crabs approximately of same size were used. Each experiment was repeated thrice and data was pooled for purpose of calculating the LC 50 values using Finney Probit analysis chart.

Results

The percentage mortality of crabs increased progressively up to 96 hrs. In all the concentrations of the pesticide coragen, the LC 50 values decreased with increasing exposure period. In the mature crabs, the LC 50 values of coragen were found to be 0.2612, 0.2280, 0.1650 and 0.1448 ppm after 24, 48, 72, and 96 hrs exposures respectively. From the above results it was observed that the LC 50 values of 96 hrs were found lowest among all the exposure periods [Table-1].

Discussion

The physico-chemical and biological components of the environment play an important role in the manifestation of biological response to the pesticide (Moore, 1969). Mortality in the crabs is a more sensitive measure of toxicants. The present study of toxicity of coragen to *Barytelphusa cunicularis* indicated that percent survival rate of the crabs decreases with increasing concentration of pesticide. In present probe, acute toxicity test shows a relationship between the length of exposure period and concentration of pesticide. The LC 50 values of the crab decreases gradually as the exposure period goes on increasing. Acute toxicity involves the damage to the organism by fastest acting mechanism. Similar results were observed by several workers such as Mirajkar 1984, Deshpande 1985, Manikumar 1985, Sharma 1989, and Yadav 1991. The results of the present experiment may be quite useful in evaluating the toxicity of coragen pesticide to the marine and freshwater crabs which are an important chain of the ecosystem.

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Table 1: Relative toxicity of coragen pesticide when crabs were exposed to the acute concentration (24 hrs to 96 hrs).

S. No.	Exposure Periods	Regression equation LC 50+SE	Homogenicity Heterogenicity	Fiducial Limit M1	Fiducial Limit M2	Relative toxicity
1	24	y=3.14 + 4.5x .2612 ± .684	-1.95	0.2465	0.4757	1
2	48	y = 3.66 + 3.8 x .2280 ± .1250	4.9176	0.2147	0.2433	1.0822
3	72	y = 4.17 + 3.5 x .1650 ± .1876	0.1946	0.03125	0.3242	1.6235
4	96	y = 4.47 + 4.05 x .1448 ± .054	-0.8162	0.0372	0.2724	1.4268