

Acute Toxicity of Indo-Sulphin to a fresh water Gastropod *Thira Lineata* Changes in Rate of Respiration

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Abstract: Toxicity of sumithion to the fresh water field crab has been studied by Bhagya Laxmi and Ramamurti (1981), Aness (1975) and Verma et al., (1978) observed the toxicity of some organophosphate compounds. The oxygen consumption has been estimated by Alam and Lomte(1984) after exposing the gastropods.

Viviparous bengalensis in zink sulphate Lowry, O. H.; Rosenbroughi, N. J.; Farr, A. L. and Randall, R. J. et. al. (1951, 1983) have observed the effects of carbaryl on oxygen consumption of the fish, *Channa punctatus* Chaudari.et.al. (1988) have observed rate of oxygen consumption.

Considering the studies on pesticide pollution on the fresh water gastropod *Thiara* on the fresh water gastropod

Thiara Lineata the present investigation has under taken with the view to understand the acute toxicity and the effect on the rate of oxygen consumption.

Organophosphate compounds are now extensively use in place of organochloride compounds on account of their lesser residuals toxicity, but the prevention of aquatic animals' mortality remains an important object of water pollution research. Kaviraj and konar (1982) have studied the effects of heavy metals on accute toxicity of mercury, chromium and cadmium and cadmium to the fish, *Tyilapia Mossambica*. Mane and Akarte (1987) have studied the effects of cythion or Malathian on the estuarine Clam *Catalasia optima*.

I. Introduction

The fresh water environment is becoming increasingly polluted with various pesticides since they are applied directly to aquatic fauna. They increase the agriculture production. None of the pesticides since they are applied directly they increase the agriculture production and none of the pesticides are specific to target species and so these chemicals causes deleterious effects or even system. The pesticides are causing undesirable effects to the organisms (Johnson 1968) are particularly susceptible to these pollutants.

II. Material And Methods

The Snail *Thiara Lineata* were collected from Girna river near kalwan. Animals were brought to the laboratory and they were cleansed to remove algae, biomass and mud etc. they maintained in laboratory conditions for a period of five days in de-chlorinated water, during no food was provided. The analysis of physico-chemical parameters of water was determined periodically from the laboratory tap water and the river water. The physico-chemical parameters like temperature, pH, total carbonates by the standard techniques of APHAC (1985)

The healthy specimens were ranging from 2.0 to 2.2 cm in length and 0.6 to 0.8 cm in width was used for experimentation.

The Indo-sulphin 32 EC was dissolved so as to get the appropriate concentrations for the exposure periods.

All the experiments were conducted in natural day light rhythms. The aeration had been withdrawn during toxic exposures. During the experimentation water of the control and experimental groups were renewed twice in a day with an interval of 12 to 13 hours. A concurrent control was run simultaneously, before each change of static biological behavior and mortality of snails were recorded.

The acute toxicity tests were performed by using Indo-sulphin 34cc for a period or 24, 48, 72, and 96, hours it is an organophosphate pesticide manufactured by VOLRHO INDIA LIMITED Secunderabad.

After exposing the animals for 24, 48, 72 and 96 hours to the pesticides survivals and the behavior of gastropods were recorded. The criteria for the mortality recorded were observed by the observation like failure of snails to respond to producing the foot into the shell, when it is pricked by needles. The percentage mortality was calculated and then it has been converted in to the profit values by means of profit table and the concentration were converted into long concentrations the graph using long concentration and profit mortality (Bailey,).

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The regression equation is calculated with long concentration and profit mortality by using formula $Y = bx + a$ from this equation the values of LC_{50} for 24, 48, 72 and 96 hrs were calculated. The LC_1 value also determined with the help of same regression equation.

The rate of oxygen consumption has been estimated by using oxygen electrode which has been provided by century insurment 1965pvt. Ltd. Chandigarh. All tge five values of respiration are subjected for the statistical analysis from “+” test (Dowdswell 1957)

III. Results

The physic-chemical parameters of the water for holding the animals and used as diluents is given in table No.1

The water does not contain any toxic substance to the snails as hence no mortality was recorded in controlled group.

The animals were exposed for ten different concentration of Indo-sulphin the animals were exposed from the range of 0.0001 to 0.015 ppm for a period of 24, 48, 72 and 96 hrs depending during the experimentation and they are considered as the behavior changes

Gastropod partly opened operculum and slightly protruded food Gastropod attached to substratum with extend foot and tentacles out of the shell.

The gust period to the death the gastropods retracted the body inside the shell at its max extent and they could not extent even when they are subjected to mechanical stimulus.

The regration equations calculated LC_{50} and LC_1 valued and the exposure periods (ie. 24, 48, 72, and 96 hrs.) are given table -2 for 24 hrs calculated LC_{50} value 150-0.0125 ppm. And LC_1 Value is 0.0027 PPM

For 72 hours of exposure calculated LC_{50} Value is 0.0058 ppm. And caluatated LC_1 value is 0.0017 for 96 hours of exposure to Indo-sulphine the calculated value is 0.00013 ppm.

The rate of oxygen consumption was estimated in controlled LC_1 and LC_{50} groups after exposing the animals for the period of 24, 48, 72 and 96 hrs to Indo sulphine

The effect of Indo-sulphine on the rate of oxygen conmsumption of fresh water gashopod Thiaralineaata from kalwan at Nashik District.

The rate of oxygen consumption in LC_1 and LC_{50} exposed groups were fluctuated from $0.167 + 0.014$ to $0.426 + 0.030$ mg/ gm / 1/ h. In LC_1 group it is fluctuated from $0.2991 + 0.482$ to $0.426 + 0.030$ mg/ gm / 1/ h/

The oxygen consumption was decreased to its max in LC_{50} exposed group after 96 hrs of exposure period (58.63 %) P (0.01)

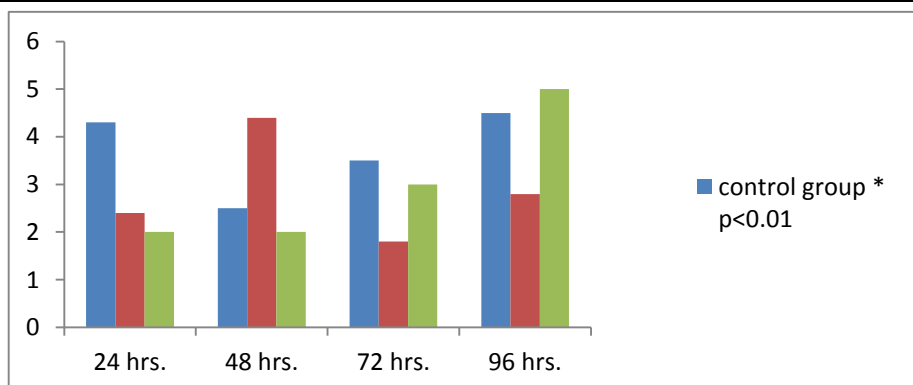
Table no -1

Physico-chemical parameters of riverine and tap water used for experimentation

Sr. No.	Parameters	Content
1	Temperature	20.0 - 22.1 C
2	PH	7.1 - 7.5
3	Dissolved	8.82 – 9.0 mg / 1
4	Total carbonate	11.3 – 11.5 ppm

Table no 2

Sr.No	Period of exposure	Calculated LC_1 ppm.	Calculated LC_{50} ppm.	Regression Equation.
1	24 hrs	0.0034	0.0142	$Y = 0.266 * x + 0.1736$
2	48 hrs	0.0027	0.0125	$Y = 0.2812 * x - 1.3043$
3	72 hrs	0.0017	0.0059	$Y = 0.2185 * x - 3.203$
4	96 hrs	0.0020	0.0021	$Y = 0.5264 * x - 2.2940$



IV. Discussion

Many chemical presides like organophosphate pesticides have been used in agriculture fields since long time such careless use of dangerous chemicals has laid to environment and occupation hazards.

Which has been well established through recent researches with the increase in industrialization and urbanization the utilization of pesticides accumulation in different body parts of the aquatic animals obviously effect different physiological activity of consumer. This may be lead into chronic diseases and ultimately death may occur to avoid this pollution maintaining device must be maintained in certain places. The pesticide must be used in minimum quantities.

But the careless used of pesticides resulted in the contamination of most of the fresh water bodies causing many fold hazards to several non target organisms many pesticides are considered hazardous because of their ability to keep and immobilized in the bodies of aquatic organisms in low concentration (Eisler 1961) the different toxicity of pesticides to aquatic organisms (Verma etc 1979) Warner (1967) in the review of bioassay using behavioral changes suggested that region of such test provide the most sensitive indicator yet develop. In the present study it has been observed that there were considerable changes in the behavioral pattern of the gastropods.

In the experimental group the content of excreta and mucus decreases. In the present study the LC₅₀ value for Indosulphane35 EC are 0.0143 0.0126 ppm. for 24hrs, 28 hrs, 72 hrs, 96 hrs respectively.

V. Summaray

The present investigation has been carried out in order to assess the acute toxicity of Indosulphane to *Thiara Lineata* and changes in respiratory rate due to each the static bioassay tests were conducted for the periods of 24, 48, 72, & 96 hrs. The regression line is obtained by using long concentration and profit mortality values.

The LC₅₀ values are determined for 24, 48, 72, & 96 hrs it was further observed that the rate of oxygen consumption significantly decreased due to the pesticide toxicity. The results are discuses in the light of available literature.

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