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Address

- Vikram Nagar, Boudhi Chouk, Latur.
- Tq. Latur, Dis. Latur 413512
- (+91) 9922455749, (+91) 9158387437

Email

- aiirjpramod@gmail.com

Website

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CHIEF EDITOR – PRAMOD PRAKASHRAO TANDALE

Effect of organophosphate sub lethal concentration on vitamin-A composition in fresh water fish *Labeo rohita*

N.V.Patil,

Shri Chatrapati Sahu Sainiki Vidyalaya,
Udgir, Dist. Latur (MH) INDIA

R.B.Deshai,

Department of Zoology,
Mahatma Gandhi Mahavidyalaya,
Ahmedpur, Dist. Latur (MH) INDIA

Abstract:-

Labeo rohita is the natural inhabitant of freshwater sections of the rivers. The Rohu thrives well in all fresh waters below an altitude of approximately 549 m. Rohu is a bottom feeder and prefers to feed on plant matter including decaying vegetation. Rohu attains maturity towards the end of the second year in ponds.

Rohu was exposed to two sub lethal concentration i.e. 0.01 and 0.015 (1.0×10^{-2} and 1.5×10^{-2}) of organophosphate Dimecron insecticide for 24 hr, 48 hr, 72hr and 96 hours.

The effect of insecticide show change in vitamin-A. The vitamin-A content of liver, Muscles decreased. This paper studied in detail about change in vitamin-A discussed in graphical presentation.

Key Words: - Organophosphate, vitamin-A, *Labeo rohita*.

Introduction:

An increasing concern about toxic hazards due to the indiscriminate use of pesticide in environment, high production and use of different pesticides formulation are the source of environmental contamination. Pesticides were beneficial to man when properly used; they may be extremely dangerous when used irrationally. Pesticides can result in acute and long term side effects on the aquatic biota.

The effect of insecticides to non target aquatic animals like fish, mollusca etc. is known (Holden, 1973; Deshai et.al. 2012; Robert 1976) A number of changes of biochemical, histological and Histopathological parameters of aquatic organism due to organophosphate is known.

The Dimecron is an insecticide is widely used in crop field for pest and insect control. The effect of insecticide Dimecron on fish *Labeo rohita* fluctuate the metabolic ratio. The present work was undertaken for study in detail about changes in vitamin-A and vitamin-B in various organs.

Material and Method:-

The fresh fish collected from LIMBOTI dam near Ahmedpur on the Maniyar River. The *Labeo rohita* average weight 10gm to 20gm and length 10cm to 25cm were used. These are acclimated for a week in laboratory. During acclimation, they were fed with rice bran and then exposed to two different concentration of Dimecron (85% Phosphomidon, a product of Ciba-Geigy India Ltd.) chemical nature is 2-chloro- 2-diethyl carbamyl-1-methyl (Vinyl-0,0-dimethyl phosphate) to detect the LC_{50} value for 96 hours is 0.02%.

The LC_{50} value determine by Litchifield and willcoxon (1949). After calculating the LC_{50} value animal submerged in two sublithal concentration i.e. 0.01 and 0.015 (1.0×10^{-2} and 1.5×10^{-2}) of Dimecron for 24 hr, 48 hr, 72hr and 96 hours respectively.

After each exposure period the animals were dissected and tissues were collected (Liver and Muscles) for the estimation of vitamin-A. Vitamin-A estimated by Antimony trichloride method (Glick, 1957)

Result and Discussion:-

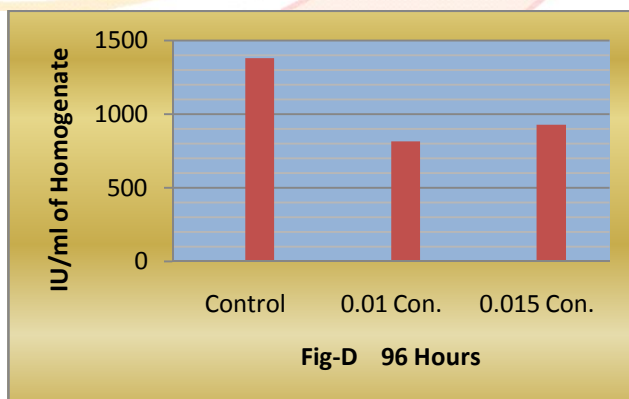
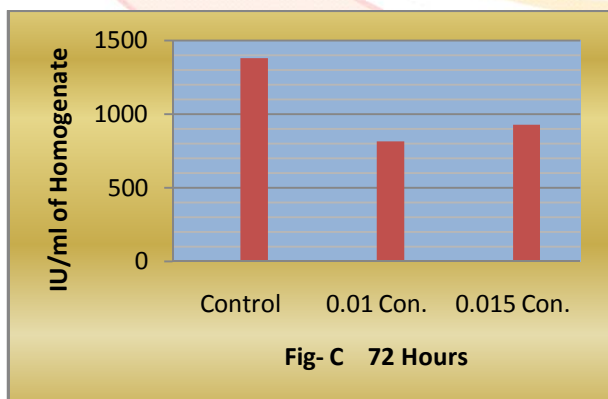
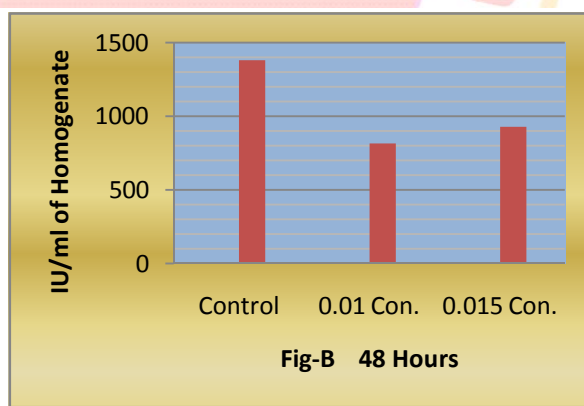
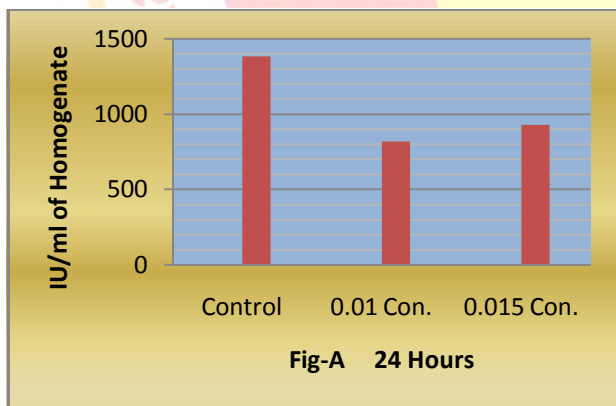
Change in vitamin-A: The decrease in vitamin-A, content was seen in liver and Muscles in both sublethal concentration. The exposure period 24 hours show decline in vitamin content in both 0.01 and 0.015 concentration of Dimecron. Whereas compare to liver the vitamin-A, gradually decreases in muscles. The lowest vitamin content seen in both sublethal concentrations was 96 hours. The result represented by table and graph.

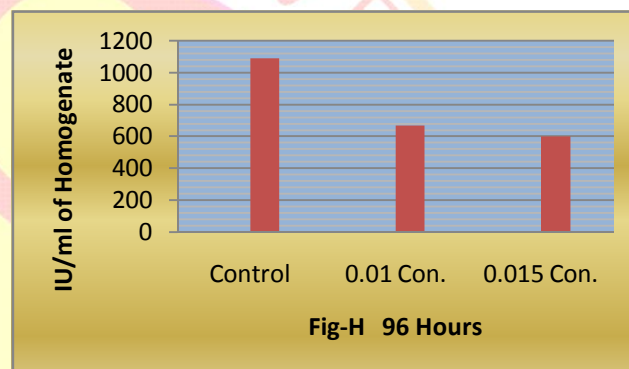
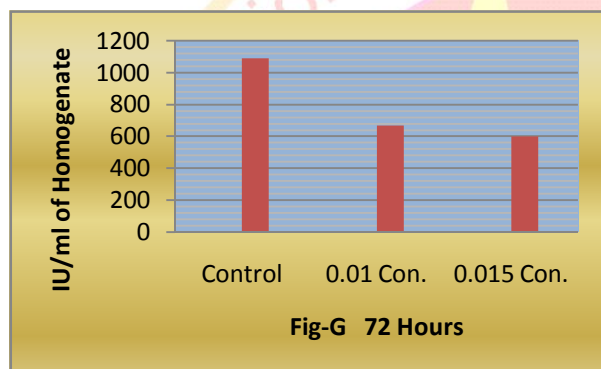
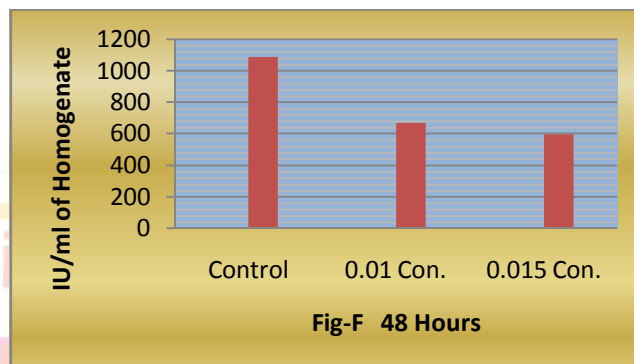
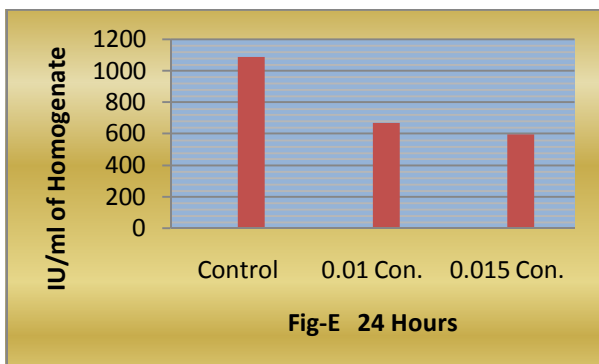
Table No.1

	Control	Experimental 0.01 Concentration	Experimental 0.015 Concentration
24 Hours	1532 ± 0.098	1222 ± 0.072	1154 ± 0.076
48 Hours	1446 ± 0.090	1215 ± 0.055	1169 ± 0.032
72 Hours	1395 ± 0.072	1009 ± 0.052	1012 ± 0.057
96 Hours	1380 ± 0.046	816 ± 0.059	927 ± 0.046

Note: 1) Each value is mean of Five observations ± S.D.
 2) Value are significant at * = P<0.05, ** = P < 0.01, ***=P < 0.001 & NS – Not significant

Vitamin-A, content in liver:-



Vitamin-A, Content in liver:

The toxic effect of Dimecron caused significant decrease in vitamin-A content of liver and muscle of *Labeo rohita*. Decrease in vitamin-A related with the decrease in lipid content in all tissue of *Labeo rohita*.

Toxic stress studied by (Mukhopadhyay and Dehadrai, 1980) also vitamin decline discussed by (Kulkarni and Kehavan, 1992). Dimecron direct effect on metabolic reaction so there was direct effect on vitamin content. The effect of pesticide on metabolic reaction indicated fluctuation in vitamin-A.

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