



**STUDIES ON THE TOXIC EFFECT OF CHLORPYRIFOS, AN ORGANOPHOSPHORUS PESTICIDE , ON THE ERYTHROCYTE SEDIMENTATION RATE (ESR) OF FRESHWATER AIR BREATHING CATFISH *CLARIAS BATRACHUS*(LINN.)**

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**ABSTRACT**

In the present investigation, the toxic effect of sub-lethal concentration of chlorpyrifos on the erythrocyte sedimentation rate ( mm/hr.) was assessed. The fishes were exposed to sublethal concentration of chlorpyrifos at 2ppm and 4ppm for 20 and 40 days duration. The observations revealed a significant increase in ESR (mm/hr.) in comparison to control ESR value.

**KEY –WORDS :** Chlorpyrifos, erythrocyte sedimentation rate, *Clarias batrachus*.

**INTRODUCTION:-**

The popular use of chlorpyrifos in agriculture has indeed boosted the crop production but, it's eco toxicity has been a great concern to the environmentalists for it's potential for adverse effects on terrestrial to aquatic lives including the various fish species. The toxic effects of various pesticides on the hematological parameters of fishes have been reported by a number of workers (Dawson,1935; Lone and Javaid.1976; John,P.J.2007)During the present work the toxic effect of chlorpyrifos has been examined on the ESR (mm/hr.) Of blood of most nutritionally and economically valued freshwater air breathing catfish , *Clarias batrachus* (Linn.)

**MATERIALS AND METHODS:-**

Live and disease free ,*Clarias batrachus* were procured from relatively unpolluted habitat, located near Denby road area (Darbhanga) measuring  $18 \pm$  cm and body wt.  $100 \pm 5$ gm. Fishes were transferred into glass aquaria (60×30×30 cm) filled with chlorine free tap water in the Zoology research laboratory of C.M.Sc. College and were acclimatised for two weeks. The fishes were daily fed with minced meat of earthworms, following standard laboratory protocol. A stock solution of commercial chlorpyrifos was prepared by dissolving 1 ml of pesticide in 100 ml of acetone. 2 and 4 ml of stock solutions were added to the aquaria containing 20 litre of water to get 2ppm and 4 ppm concentrations of chlorpyrifos respectively. The fishes were separated in experimental groups and a control group. The fishes were sacrificed after each experimental exposure period to get adequate amount of blood. The ESR (mm/hr.) of each experimental fish group was determined by Wintrobe method.

**RESULT AND DISCUSSION:-**

**TABLE:-**  
**EFFECT OF CHLORPYRIFOS ON THE ESR OF BLOOD OF *CLARIAS CATRACHUS*(LINN)**

NO. OF DAYS OF EXPOSURE	CONCENTRATION OF CHLORPYRIFOS	ERYTHROCYTE SEDIMENTATION RATE (MM/HR)
CONTROL		0.58 ± 0.2
20 DAYS	2PPM	0.64 ± 0.02*
	4PPM	0.84 ± 0.64*
40 DAYS	2PPM	0.70 ± 0.03*
	4PPM	1.02 ± 0.05*

EACH VALUE IS MEAN ± SD 5 OBSERVATIONS

SIGNIFICANT :- (P < 0.05)

ESR (Mm/Hr.) Of 2ppm Chlorpyrifos After 20 Days Exposure Was Recorded  $0.64 \pm 0.02$  And After 40 Days Exposure  $0.70 \pm 0.03$  In Comparison To Control ESR (Mm/Hr.),  $0.58 \pm 0.02$ . After 20 Days And 40 Days Exposure Under 4 Ppm Chlorpyrifos The ESR (Mm/Hr.) Were Recorded  $0.84 \pm 0.06$  And  $1.02 \pm 0.05$  Respectively In Comparison To Control.

The Present Result Which Shows Conspicuous Increase In ESR Is In Unison With The Findings Of Kumar And Banerji ( 1990) , Who Reported Increased ESR Of Blood Of *Clarias Batrachus*, Exposed To Sevin , And Observation Of Chaturvedi And Agrawal( 1993) Who Observed Increased ESR Of Blood Of *Heteropneustes Fossilis* Exposed To Alachlor And Rogar .An Increase In ESR Might Be Attributed To Increase In The Concentration Of Fibrinogen Which Causes Fibrinogemia Due To Chlorpyrifos Exposure (Singh And Bhati (1991.) Jyotsna Et Al.,(2003) Also Reported Increased ESR Of Blood Of Rabbit, Fed With Oral Dose Of Malathion.The Present Finding Appears To Be Very True To The Findings That , The ESR Is Negatively Correlated With Total RBC Count, Ie Lower The Total RBC Count Higher Will Be The ESR (F.A.Malla, G.Sharma , S.Singh(2009)

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