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SHORT COMMUNICATION **OPEN ACCESS**

Assessment of Lipoproteins in *Channa punctatus* under Toxic Stress of Mancozeb and Malathion in Combination

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ABSTRACT
In the present study, an attempt was made to understand the effect of sublethal concentrations of paper mill effluent on lipid profiles of Channa punctatus after exposure to 96 hours. The low density lipoprotein, very low density lipoprotein have been observed to be increased, while a decrease in high density lipoprotein has been observed after 24hrs, 48hrs, 72hrs and 96hrs exposure to mancozeb+malathion in experimental fish Channa punctatus.
Keywords: Channa punctatus, mancozeb+malathion, lipoproteins

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INTRODUCTION

Insecticidal use in agriculture gained momentum round the mid twentieth century. Fungicides also are utilized in agriculture for the prevention of mycosis in seed corn. Later these compounds discharge in nearby water bodies and consumed by fishes and other aquatic life. These fat soluble contaminants concentrate within the fat of fishes by bioaccumulation and bio- magnification [1]. The fishes, best indicator of water body pollution, are the foremost sensitive of all the aquatic animals towards the pollutant. The buildup of effluents becomes hazardous to the aquatic organism because they're the foremost important factors of organic phenomenon. The desperate and uncared use of fungicides in agriculture practices has further enhanced the matter to the worldwide importance [5]. Lipids play an important role in the architectural dynamics of the cell and transport mechanism across the cell membrane. Lipids also contribute to energy production as they have high caloric values and play a vital role in the biochemical adaptations of animals to stress conditions [3]. Hence, the present investigation is aimed to study the effect of sublethal concentrations of mancozeb+malathion on the lipoprotein metabolism of Channa punctatus.

MATERIAL AND METHODS

PROCUREMENT OF TEST FISH.

Healthy specimens of snake-headed fish, *Channa punctatus* Bloch (Actinoptrygii: Channidae) with bodyweight 45±5 g and body size 12±5 cm, were collected from a local fish farm Lucknowr (Uttar Pradesh), India, and were transported to the laboratory. The fishes were carefully examined for any injury and then kept in 1 % solution of KMnO4 for few hours to get rid of dermal infection. These were further kept in a large plastic jar containing 50 L of clean tap water and acclimatized for 15 days to the laboratory conditions. During these periods, the fishes were fed on boiled egg yolk and commercial fish food.

ANALYSIS OF LC_{50}:

LC_{50} value of mancozeb+malathion was 27.28mg/25L with variance 0.0003, fiducial limits 1.4416(+) and 1.4352(-) and regression equation Y = 4.56+4.85 (X-1.34) for the fish *Channa punctatus* (Bloch.). The sublethal concentration is $1/10^{th}$ of LC_{50} i.e. 2.728mg/25L [2].

EXPERIMENTATION:

The experiment was conducted in five aquariums one was used for control and rest are used for pollution study. Each aquarium contains 10 fishes, which were exposed to sub lethal concentration of mancozeb

and malathion in combination at different time interval (24, 48, 72 and 96 hour). The sub lethal concentration was selected on the basis of LC_{50} value.

COLLECTION OF BLOOD

The blood samples were collected from live fishes through a cardiac puncture in both experimental and control groups at 24, 48, 72, and 96 hours exposures. These were allowed to stand for some time and, after that, centrifuged at 3500 rpm for 10 min to obtain serum.

ESTIMATION OF HIGH DENSITY LIPOPROTEIN (HDL): High density lipoprotein was estimated by the Warnick *et al* [8].

$$\text{Serum HDL (mg/dl)} = \frac{\text{O.D. of 'Test'}}{\text{O.D. of 'Standard'}} \times 75$$

ESTIMATION OF LOW DENSITY LIPOPROTEIN (LDL): Low density lipoprotein (LDL) was calculated from the values of serum cholesterol, very low density lipoprotein (VLDL) and high density lipoprotein (HDL) by using following formula given by Friedwald *et al*. [2].

LDL = CHOLESTEROL – (VLDL + HDL)

ESTIMATION OF VERY LOW DENSITY LIPOPROTEIN (VLDL): Very low density lipoprotein (VLDL) was calculated by the following formula given by Friedwald *et al*. [2].

$$\text{VLDL} = \frac{\text{Triglyceride (TG)}}{5}$$

RESULTS AND DISCUSSION

The low density lipoprotein, very low density lipoprotein have been observed to be increased, while a decrease in high density lipoprotein has been observed after 24hrs, 48hrs, 72hrs and 96hrs exposure to mancozeb+malathion in experimental fish *Channa punctatus* (Table-1-3).

Table 1: High density lipoprotein (mg/dl) in *Channa punctatus* after sub-lethal mancozeb + malathion intoxication

HDL	Control	Exposure Hours			
		24 hours	48 hours	72 hours	96 hours
Mean	55.67	52.50	46.67	42.30	38.50
±S.Em.	±0.45	±0.37	±0.33	±0.38	±0.28
Significance level	-	P> 0.05	p< 0.05	p< 0.01	p< 0.001

S.Em. = Standard error of mean

Table 2: Low density lipoprotein (mg/dl) in *Channa punctatus* after sub-lethal mancozeb + malathion intoxication

LDL	Conrol	Exposure Hours			
		24 hours	48 hours	72 hours	96 hours
Mean	72.40	75.37	81.50	86.70	91.57
±S.Em.	±0.50	±0.45	±0.33	±0.37	±0.62
Significance level	-	P> 0.05	p< 0.05	p< 0.01	p< 0.001

S.Em. = Standard error of mean

Table 3: Very low density lipoprotein (mg/dl) in *Channa punctatus* after sub-lethal mancozeb + malathion intoxication

VLDL	Control	Exposure Hours			
		24 hours	48 hours	72 hours	96 hours
Mean	30.66	35.33	38.65	41.30	44.50
±S.Em.	±0.18	±0.19	±0.25	±0.33	±0.35
Significance level	-	P> 0.05	p< 0.05	p< 0.05	p< 0.01

S.Em. = Standard error of mean

The lipoproteins alterations are significant after treatment. It may be intoxication of pesticides on cholesterol and other lipid metabolism and may increased level of LDL, VLDL, while decreased in HDL levels in blood.. Further, this may also be due to hindrance in lipid metabolism which results in

accumulation of lipid content in blood. In accordance to the present findings, similar increased lipid profile has been reported by Ghosh [1] who observed the alterations of cholesterol in blood of *Channa punctatus* over the influence of Chromium and Radha *et al*. [4] observed blood and hepatic cholesterol HDL, VLDL and LDL inhibited throughout the experimental period under stress in *Cyprinus carpio,* and similar results observer by [6, 7]. These findings are in favour of the explanation of the present work. The changes are due to alteration in enzymes governing lipid, lipoprotein and triglyceride metabolism.

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