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"STUDY OF INSECTICIDES EXPOSURE AND GLYCOGEN CONTENT OF MUSCLES IN FISH LOBEO ROHITA"

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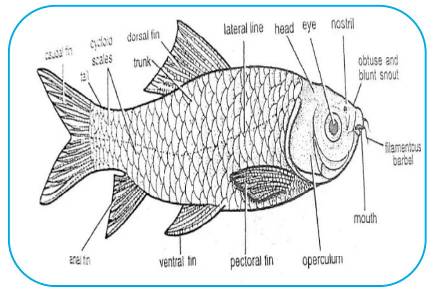
ABSTRACT:
As toxicological view, fish directly correlated through ecological toxicants for instance toxic elements that create possible threats to humans. As fish is accepted choice of protein through greater part of population in Madhya Pradesh, India. Study aims to determine attention of insecticides in commonly consumed Labeo rohita fish, study side wise also adjoined with determination of influencing factors of insecticides status in experimental fish. Toxic status determined through acceptable national and international guidelines.



KEY WORDS: Insecticides, Glycogen, Muscles and fish Lobeo rohita.

INTRODUCTION

Oceanic toxicology is alluded to because the research of influences of herbal pollution on sea-going creatures (Helfrich et al., 2009; Srivastava et al., 2016). In all regions of the planet insecticides were discovered within side the oceanic surroundings and feature become a global issue (Adedeji and Okocha, 2012; Sabra et al., 2015). Not in any respect like different non-goal creatures fish and oceanic residing beings are in impact usually offered to insecticides, on the grounds that they pour a ton of time and electricity into submerged (Stanley et al., 2016).

Because of this motive insecticides were regarded as pretty dangerous to sea-going residing things. It is far-fetched that insecticides ranges with inside the sea will surpass the ones in freshwater, because the weakening with inside the sea could possibly result in focuses now no longer precisely the ones in waterways and streams (Giesy et al., 1999).

Fish are in general offered to insecticides in 3 important ways (Sabra et al., 2015).

1. Dermally, direct retention thru skin.
2. Inward breath, direct take-up of insecticides thru gills.
3. Oral drinking/ingestion of debased water/meals.

A few artificial compounds is probably profoundly toxic through one path but now no longer others. The degree of a toxic response of a substance can range notably depending upon elements like openness path, term, measurements, physiological homes of the compound, species, and man or woman responsiveness (Helfrich et al., 2009). A component is alluded to as how plenty a damaging compound getting into a natural entity, communicated as mg/kg (Helfrich et al., 2009).

The component inflicting 1/2 of lethality in a guinea pig population is known as LD50. The greater modest the really well worth of LD50 the greater toxic is the substance. LC50 represents lethal awareness 1/2 of is applied for the convergence of a compound in air or in fluid arrangement (Casarett et al., 1996). At the factor whilst a compound reasons a characterized kind of harmfulness there exists a component under which no great effect takes place, known as the edge. The maximum expanded component at which no toxic effect is visible is known as no great effect degree and the least component at which there has been a observed dangerous or adverse effect is known as maximum decreased observed destructive effect degree.

These considerable toxicological thoughts are applied to decide quantitative exams of harmfulness of artificial materials in component response bends. Pesticide harmfulness to fish has been researched in some examinations. Pesticides effect on fish is probably something from extreme moral first-class to sub lethal influences. Ongoing (nonstop, lengthy haul) openness to low convergences of insecticides would possibly purpose diverse influences such oxidative harm, restraint of acetylcholine esterase (AChE) action, histopathological changes, formative changes, propagation, mutagenesis and cancer-inflicting nature (Sunanda et al., 2016).

Pesticide openness to fish and different amphibian natural entities is based upon its bioavailability, bio-concentration, biomagnifications and ingenuity with inside the climate (Sabra et al., 2015). Bioaccumulation is characterized because the take-up, potential and series of pollution in creatures from their modern circumstance (Segner, 1998), and it takes place whilst a existence shape keeps a substance at a fee faster than that at which the substance is lost. Numerous insecticides are lipid-dissolvable and collect in greasy tissue of residing creatures and biomagnified up the meals web (Sunanda et al., 2016). Openness to several insecticides would possibly activate artificial institutions among them that increment their poisonousness.

MATERIAL AND METHODS :

Various essential criteria are available, especially for choosing of fish which were applicable in experimental aspects. In the toxicological points of experimental determination a common consumable freshwater survival species of fish was taken. Mostly aquatic animals have remarkable capacity of extracting and concentrating certain chemicals from water *via.,* respiration. Hence, among aquatic test species, fish have been widely used as representative of toxicity studies for their ecological and economic importance, availability Stebbing (1985) recreational value and higher' position in trophic level in the aquatic food chain. Fish are a very useful barometer of the real state of purity of water, by considering the above points, the right species should be chosen as a model, so that the observed results can be extrapolated to field conditions.

RECRUITMENT OF FISH FOR EXPERIMENT

Healthy specimens of *Labeo rohita* (Hamilton) and *Cirrhinus mrigala* were selected, sampled and transported to laboratory in polyethylene bags containing oxygenated water with the help of Fisheries development Corporation Limited, Sidhi district, Madhya Pradesh, India. Fish of the same age and size from the same brood stock were collected. The fishes were brought to the laboratory without any mechanical injury.

Fish stock were maintained in a clean disinfected large rectangular tank previously cleaned with water and disinfected with 1% potassium permanganate to avoid fungal contamination and then sun dried. They were acclimatized to laboratory conditions in well aerated water, before being used for experiments. Media were changed frequently to avoid fungal growth and contamination by metabolites. These stocks were well aerated with aerators.

During the acclimatization period, fish stocks were fed *ad libitum* with groundnut oil cake and rice bran powder in the ratio of 1:2. Feeding was stopped two days prior to the commencement of experiments to keep the experimental animals more or less in the same state of metabolic requirement. During acclimatization, the fish stock was maintained at natural photoperiod and ambient temperature. From this stock fish with an average length of 8-10 cm and weighing 28±0.8 g were segregated they were categorized under complete health condition. Healthy fishes were then transferred to clean rectangular glass aquarium tanks, containing dechlorinated tap water.

INSECTICIDES (CARBAMETES AND CHLORPYRIFOS) STUDIES AS TOXICANT:

Carbametes and Chlorpyrifos both are important insecticides with the potential toxicant. Carbametes and Chlorpyrifos were used for the present study by dissolved in the deionized autoclaved water to prepare the concentrations that used in the experimental study.

RESULT AND DISCUSSION :

The level of muscle glycogen in *Lobeo rohita* was measured after exposure to insecticides (Carbamates and Chlorpyrifos) for 10- 30 days. The study on Carbamates insecticide exposure found a minimum of 2.51 mg/g glycogen content with 0.10ppm after 30 days of exposure, and a maximum of 3.79 mg/g glycogen content in *Lobeo rohita* muscles after 10 days of treatment with 0.02ppm insecticide concentration. In the case of Chlorpyrifos exposure, the minimum glycogen content was found to be 2.95 mg/g at 0.10ppm after 30 days, and the highest glycogen content was found to be 3.96 mg/g at 0.02ppm after 10 days. As a result, the study concluded that in the case of both insecticides (Carbamates and Chlorpyrifos), glycogen content in *Lobeo rohita* muscles was decreasing in order of concentration. After 30 days of Chlorpyrifos exposure, the lowest 3.16 mg/g glycogen level was identified at 0.10ppm, while the highest 3.72 mg/g glycogen content was detected at 0.02ppm after 10 days of exposure. As a result, the study concluded that, in the case of both insecticides (Carbamates and Chlorpyrifos), glycogen content in *Lobeo rohita* muscles decreased as concentration and exposure time increased. The least 3.18 mg/g glycogen content was found in *Lobeo rohita* muscles with 0.10ppm pesticide concentration after 30 days of exposure, while the highest 3.84 mg/g glycogen content was found in *Lobeo rohita* muscles with 0.02ppm insecticide concentration after 10 days. For 10-30 days after exposure to insecticides (Carbamates and Chlorpyrifos), the glycogen content of muscles in *Lobeo rohita* was measured (Table -1, Fig -1).

Table - 1 Glycogen content (mg/g) of muscles in *Lobeo rohita* under insecticide (Carbamates and Chlorpyrifos)

Conc. of insecticides (ppm)	Carbamates exposure days (mean ± SD, n=3)			Chlorpyrifos exposure days (mean ± SD, n=3)		
	10	20	30	10	20	30
Control (0 ppm)	3.92 ± 0.02	3.81 ± 0.05	3.70 ± 0.25	3.84 ± 0.45	3.72 ± 0.01	3.64 ± 0.15
0.02 (ppm)	3.84 ± 0.03	3.74 ± 0.25	3.68 ± 0.03	3.72 ± 0.26	3.50 ± 0.02	3.46 ± 0.02
0.04 (ppm)	3.74 ± 0.02	3.63 ± 0.25	3.55 ± 0.03	3.62 ± 0.25	3.58 ± 0.02	3.40 ± 0.06
0.06 (ppm)	3.62 ± 0.02	3.54 ± 0.00	3.42 ± 0.30	3.60 ± 0.05	3.58 ± 0.00	3.43 ± 0.14
0.08 (ppm)	3.50 ± 0.05	3.41 ± 0.26	3.29 ± 0.14	3.54 ± 0.05	3.36 ± 0.25	3.50 ± 0.03
0.10 (ppm)	3.38 ± 0.30	3.24 ± 0.14	3.18 ± 0.15	3.42 ± 0.00	3.24 ± 0.06	3.16 ± 0.04

Fig -1 Glycogen content (mg/g) of muscles in *Labeo rohita* under insecticide (Carbamates and Chlorophyrophos) (* Carbamate - Carbamates, *Chlorpyrifos-Chlorophyrophos).

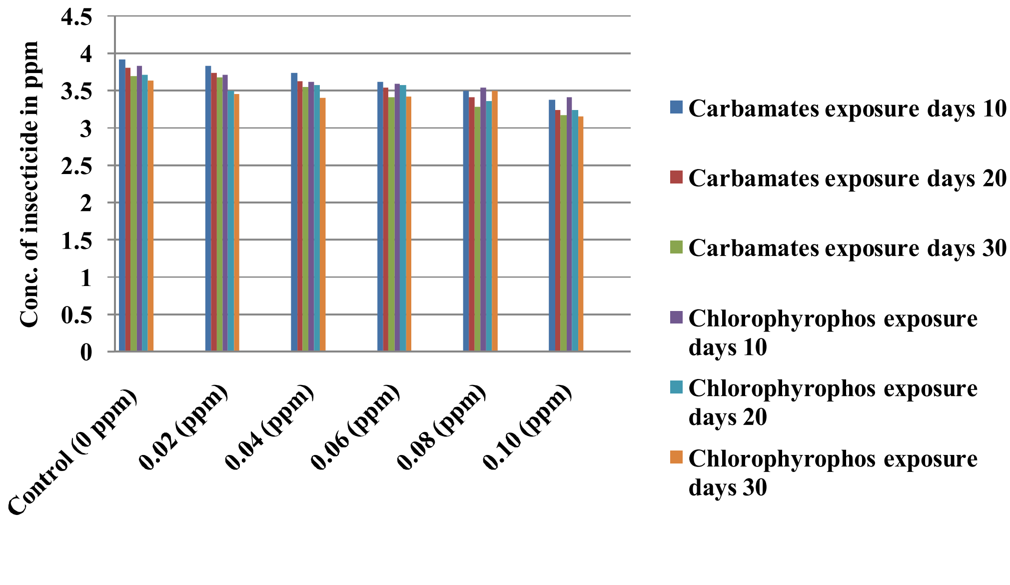


Fig -1 Glycogen content (mg/g) of muscles in *Lobeo rohita* under insecticide (Carbamates and Chlorpyrifos)

CONCLUSION:

Insecticides are highly toxic as diverse appearances of insecticide display dissimilar impacts to flora and fauna. Some specific processes such as insecticide biogeochemical cycling, insecticide are likely to have a extensive residence time in environment in addition to finally employments its technique into the aquatic system. Perhaps the majority of toxic appearance of insecticide to human is from the utilization of fish which contaminated by means of insecticide. Agronomic discharge contained inorganic insecticide which was ingested through fish in any water ecosystem and lastly ate by humans. Local inhabitants, consume fish begin to display signals of neurologic injures and additional importantly babies representation to insecticide from pregnant mothers were harshly influenced. As insecticide was also finding out in breast milk of mothers, the babies contact to insecticide carry on after birth.

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