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SPONTANEOUS BIOCHEMICAL CHANGES OF PESTICIDES ON FRESH WATER FISH*CATLA CATLA* IN BULDANA

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INTRODUCTION:

Industrialization of the world affects the faunal diversity of the water, as the waste water from these industries is directly dumped into the water bodies without any treatment. Water pollution is a global issue, as the rising population leads to a number of industries such as pesticides, paper, and fertilizers. These chemicals pollute the ponds, lakes, and river water. The chemicals from these industries directly affect the faunal diversity of our country and fish are mostly affected among them. Pesticides are used worldwide in agriculture andaquaculture to control the pest and insects (EnisYonar *et al.,* 2012). Organophosphate pesticideslike ethion, dimethoate, monocrotophos andchlorpyrifos are widely used for paddy croppests. The widespread use of synthetic organic pesticides over decades has let to their frequent exposure in the environment. Also acute and chronic exposures of humans to pesticides occur during their commercial production and their application. Fishes are a major source of proteinous food of our masses. Once the effluents are discharged into the water bodies, the toxins are incorporated in the bodies of fish resulting in bioaccumulation of the toxins and if these fish are consumed as food by the people, some of the toxins cause several health hazards in them due to biomagnifications. The pesticides, fertilizer chemicals can adversely affect the physiology, histopathology and biochemistry of fish fauna. These chemicals are sub-lethal for fish and their toxicity leads towards the mortality of fish. The aim of present study is to check out the sub lethal effects of pesticides and fertilizers chemicals on histopathology of fresh water fish Catla catla.

MATERIAL AND METHODS

Catla catla fishwere catched from Sangam Talao. The fishes are nearly 45-50 gms.. Healthy fishes were carefully packed in a medium sized polythene bag with sufficient oxygen which would help them to carry on their normal processes of metabolic activities during their period of transportation. When arriving in Laboratory fishes were carefully transformed into large glass aquarium.

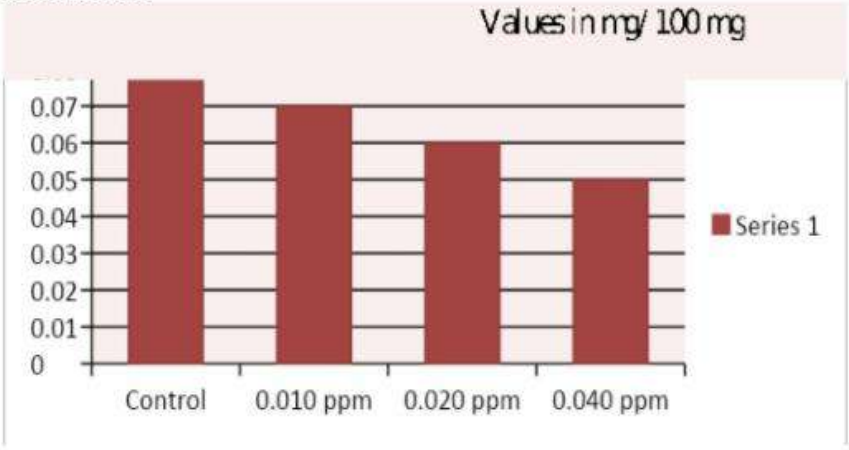
They were left for acclimatization in the normal laboratory conditions for a period of ten days. During this period standard formulated feed was given to all the fish as per the conditions suggested by Behunger (1973). Feeding was stopped one day before commencing of experiments in order to minimize the quantity of excretory products in the test tank. After acclimatization the fish were weighted totally and individually, and then transformed into the treatment tubs carefully. The physico chemical conditions of well water used in the present study has the following characteristics; Dissolved oxygen 7.8 - 8 ppm; Salinity 0.4 - 0.6 ppm; Alkalinity 250 mg/l as CaCO3 ; Hardness 376mg/l; as CaCO3 PH: 7.3 to 7.6; Temperature : 27 ± 2°C.

The fishes were exposed to different acute concentrations of Profenofos 50% Ec (0-4-bromo-2-chlorophenyl 0-ethyl S-propyl phosphorothioate) to arrive at LC50.The LC50 was determined following the procedure of Finney (1971).Based on the results of the acute toxicity study, with a LC50 value of 0.6

ppm doses of sub acute value of Profenofos 50% E.C. were selected for subacute exposure following the procedure of Desi et al. (1985). Fishes were divided in three treated and one control. In each aquarium 2 fishes are released. In the experimental set up profenofos sub acute values of 0.015, 0.030 and 0.06 ppm were added to the glass aquarium. Muscle sample from the experimental fishes were dissected out by sacrificing the fishes after 48Hrs time intervals. Muscle is the edible portion of the fish energy yielding substances like protein (Lowry et al. (1951) with Folin-Phenol reagent), carbohydrate (Anthrone method Roe, 1955) and cholesterol (Allain, 1974). in the muscle were analysed using standard procedures .

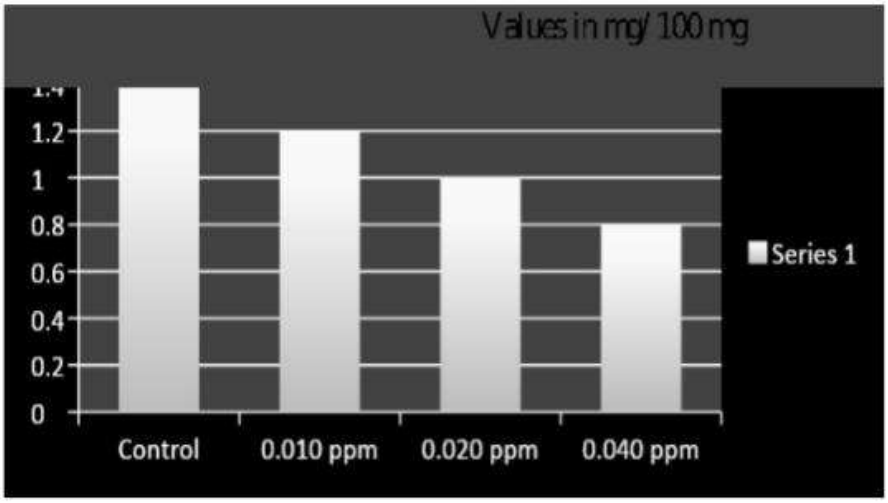
RESULTS

The LC50 value of Profenofos for *Catla catla* was 0.6 ppm. The subacute concentrations were 0.015 ppm, 0.030 ppm and 0.06 ppm were taken for concentrations. The concentration of Profenofos showed the spontaneous biochemical changes, and reduces the levels of biochemicals such as Protein, carbohydrate and Cholesterol.



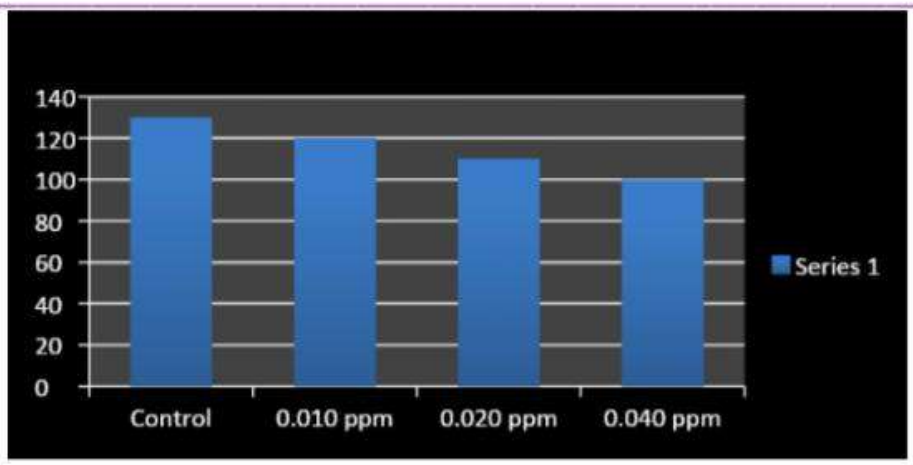
Conc. of profenofos

Estimation of Carbohydrate in the muscle sample of *Catla catla*



Conc. of profenofos

Estimation of Protein in the muscle sample of *Catla catla*



Conc. of profenofos

Estimation of Cholesterol in the muscle samples of *Catla catla*

DISCUSSION

The biochemical analysis of the present study reveals a significant decrease in all the biochemical parameters. The total protein concentration in the present study reveals a significant decrease in the level of proteins in the fishes treated with profenofos. Proteins are the most abundant carbon compound in all the living organisms (Parameswaran et al., 1987). It is the dominant biochemical constituent in the tissues of fishes (Pillay and Nair, 1973). Holbrook (1980) stated that the toxicant may directly cease protein synthesis.

There was a significant reduction in the levels of carbohydrate content. The oxidation requirements of the living organisms require carbohydrate and they are used as chemical energy through the breakdown of glucose by the citric acid cycle (Quastel, 1969). The metabolism of carbohydrate decreases when the fish are exposed to toxicants is due to the fact that carbohydrate forms the immediate source of energy that increases the stress caused by the toxicant.

REFERENCES:-

- Allain CC, Poon L, Chan SG, Richmond W (1974). Fu, P.Enzymatic determination of the total Serum Cholesterol. Chin.Hem. 20,470.
- Behunger MP (1973).Laboratory care for Vertebrates.in: Technical and Materials and Biology"McGraw Hill Inc., New York, USA, pp.171-174.
- Desi I, Varga L, Dobronyi I, Szklenarik G (1985). Immunotoxicological investigation of the effects of a pesticide cypermethrin, Arch. Toxical.Suppl., 8, 305-309.
- Enis Yonar, M., Serpil Mise Yonar, Mevlit Sener, Ural Sibel Silici and Mustafa dusukcan, 2012. Protective role of propolis in chlorpyrifos-induced changes in the haemotological parameters and oxidative antioxidative status of *Cyprinus carpio. FoodChem. toxicol.,* 50: 2703-2708.
- Finney DJ (1971). Probit analysis, 3rd Edn., (Cambridge University Press, Cambridge), pp. 20.
- Holbrook, DJ., (1980). Effects of toxicants on nucleic acid and protein metabolism. In: Introduction to biochemical toxicology. (Eds. Hodgson, E and Guthrie F.E), Blackwell Scientific Publications, U.S.A., pp.261 -289.
- Lowry OH, Rosenbrough NJ, Farr AL, Randall RJ (1951). Protein measurement with Folin reagent. J. Biol., Chem., 193:265-275.
- Parameswaram R, Ananthakrishnan TN, Ananthasubramaniam KS (1987). Outlines of Animal Physiology S Viswanathan (Printers and Publishers) Pvt. Ltd., Chetput, Chennai (India).

- Pillay KK, Nair NB (1973). Observation of the biochemical changes in gonads and other organs of UCA annulipes, portunus pelagicus and metapenaeus affinis (Decapode: Gustacea) during reproductive cycle. Mar. Biol., 18: 167-198.
- Quastel JH (1969). Carbohydrate metabolism in the nervous system. In : The structure and function of Nerves (Ed., CH. Bourna) Vol.3, Academic Press, New York, USA pp.61.
- Roe JH (1995).The determination of sugar in blood and spinal fluid with anthrone reagent J. of Biol., Chem., 212 (335-343).