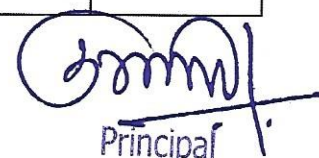


 **CONTENTS OF ENGLISH PART - I** 

S. No.	Title & Author	Page No.
1	Dale's Cone of Experience: A Source for Innovative and Effective Teaching - Learning Process Ms. Anju Chaplot	1-6
2	Effectiveness of Interactive Smart Board (ISB), in Teaching of Science Subject - A Literature Review Muntajeb Ali Baig	7-13
3	To Study the Efficacy of Learning Styles Adopted in an Operational Class of Management Studies Naresh Sukhani	14-20
4	Social Perception of Body Esteem among Adolescents and Adults Nidhi Ramani Bhumika Sharma	21-26
5	Role of Librarian as a Bibliotherapist in Higher Education Dr. Pradnaya Anil Bhosekar	27-32
6	Role of ICT in Developing 21st Century Skills in Higher Education Dr. G. Vijayakumari Mrs. Prajnya Sarangi	33-39
7	Co - Operative Learning: A Constructive Approach to Teaching Ms. Pratiksha C. Shirodkar	40-46
8	"Arts and Aesthetics Development as a Way of Thinking and Being" - Need of Higher Education Mrs. Priti Suresh Chandorkar	47-51
9	Importance and Effectiveness of E - Learning in Teaching and Learning Dr. Priya J. Shah	52-58
10	Role of Google in ICT Enabled Teaching, Learning, and Research Prof. Manisha D. Patil	59-65
11	Information and Communication Technology in Education Ranju T. Nair	66-69
12	Tihar Haat: A Success Story Sabiha More	70-75


Principal

❧ **CONTENTS OF ENGLISH PART - I** ❧

S. No.	Title & Author	Page No.
13	Flipped Learning - A New trend for the 21st Century Learners Safiya Mulla Dr. Vishnu M. Shinde	76-80
14	A Study on the Mobile Friendliness of Indian Universities and Digital Literacy Mr. Sagar Bhalerao Mrs. Amrin Moger P. J. Mathew Martin	81-88
15	A Review of Suitability and Efficaciousness of Flipped Learning Pedagogy as Conjecture of Egalitarian Philosophy in Higher Education Context Sarika Chhabria Talreja	89-95
16	Prospects of Higher Education: With Special Reference to the Importance of Internship in Legal Education Savina R. Crasto	96-101
17	Nomadic Tribes Women's Status of Past, Present in Maharashtra Gade Ketaki Vilas	102-107
18	Physical Education - Path to All Round Development Shobha K. S.	108-110
19	A Study on Student Teacher Preception W.R.T. Innovative Teaching Learning Practices in Higher Education Shraddha Nilesh Kolge Dr. Shraddha Mayuresh Bhome	111-115
20	Equal Opportunity and the Right to Higher Education Shylaja Sherief	116-120
21	Antimicrobial Macromolecules: Synthesis Methods and Future Applications Ashwini Ashok Pawar	121-125

❧ CONTENTS OF ENGLISH PART - I ❧

S. No.	Title & Author	Page No.
22	Three Bodhisattva & there Iconography Prakash Bhikaji Tupe	126-130
23	Effects of Pesticides on Fresh Water Fish <i>Catla catla</i> Collected from Koradi Dam of Buldana District (M.S.) S. S. Baad	131-135


Principal

Jawahar Arts, Science & Commerce College,
Andur Tal. Tuljapur Dist, Osmanabad

23. Effects of Pesticides on Fresh Water Fish *Catla catla* Collected from Koradi Dam of Buldana District (M.S.)

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Abstract

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. 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 bio magnifications. The pesticides, fertilizer and chemicals can adversely affect the physiology of organisms.

Key words:- Industrialization, Pesticides, fertilizer, chemicals, health hazards, pollute, effluents etc.

Introduction

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 and aquaculture to control the pest and insects (Enis Yonar *et al.*, 2012). Organophosphate pesticides like ethion, dimethoate, monocrotophos and chlorpyrifos are widely used for paddy crop pests. The widespread use of synthetic organic pesticides over decades has led to their frequent exposure in the environment. Also acute and chronic exposures of humans to pesticides occur during their commercial production and their application. 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*. Histopathological work was carried out at laboratory



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Material and Methods

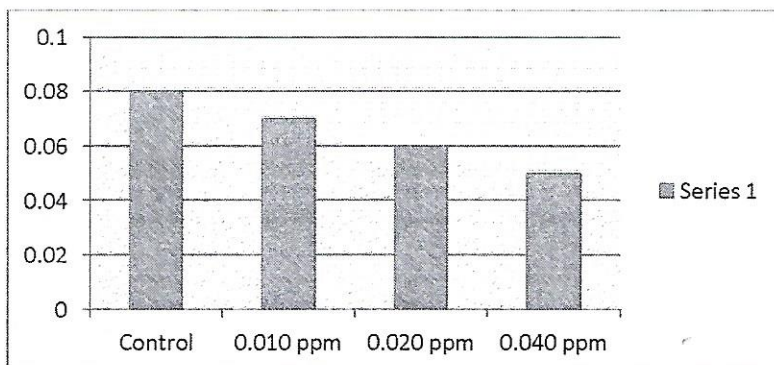
Catla catla fish were caught from Koradi Dam. The fishes are nearly 45-50 gms.. Healthy fishes were carefully packed in a medium sized polythene bag with sufficient oxygen which would help them to carry on their normal processes of metabolic activities during their period of transportation. When arriving in Laboratory fishes were carefully transferred 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 transferred 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 °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 .

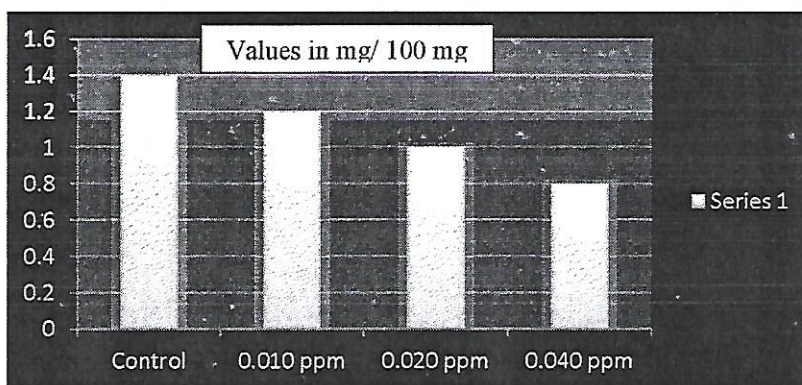
Results

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.



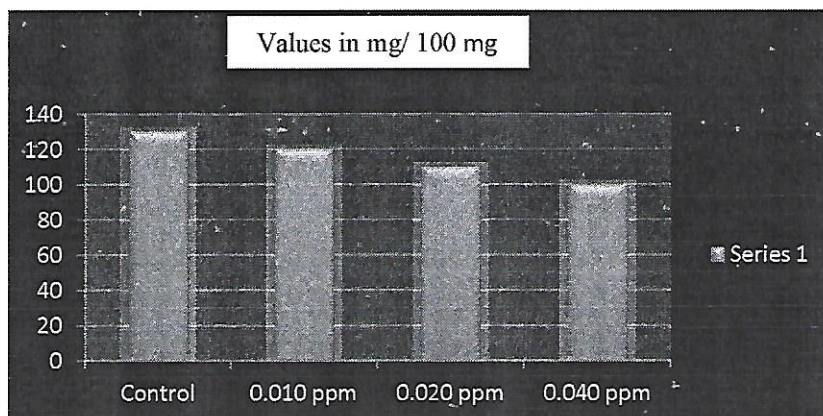
Conc. of profenofos

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*


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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.

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