“Impact of TBTO on some Physiological aspects in freshwater fish, Rasbora daniconius”

MINOR RESEARCH PROJECT

(COMPLETION REPORT)

SUBMITED TO,

UNIVERSITY GRANTS COMMISSION

WESTERN REGIONAL OFFICE

GANESHKHIND PUNE

PIN-411007

BY

DR.P. S. KHARAT

F.NO. 47-1868/11(WRO)

DEPTT.OF ZOOLOGY

NUTAN MAHAVIDYALAYA SAILU,

DIST.PARBHANI-431503

Abstract of minor research project

Title

Impact of TBTO on some physiological aspects in freshwater fish, *Rasbora daniconius*

Toxicity Evaluation

Freshwater fish, Rasbora daniconius exposed to lethal concentrations of TBTO for 24 h, 48, 72h and 96 h exposures were studied in terms of their general behavior, rate of survival and mortality. The fish exposed to zero toxicants were observed to have normal activities such as steady balance, normal surfacing phenomenon non aggressive movement or irregular vertical revolving movements. The activity of fish, Rasbora daniconius exposed to lethal concentrations showed minor changes in behavior which were intermediate. Continuous and increased respiratory movement, agitated activity of fins and finally autotomy followed by paralysis. Degree of autotomy varied with the time of exposure. Higher concentration induced increased autotomy in fishes with in 12 h , where as in chronic concentrations of TBTCl, atomized its find within 16 to 20 h. the results of the bioassay testes are presented in table 1. The fish *Rasbora daniconius* showed approximately identical symptoms in behavioral abnormalities. LC50 values decreases with increase in exposure period. The percentage of mortality increased progressively upto 96 hrs. The 24 hrs., 48hrs., 72 hrs and 96 hrs LC50 values were found to be 0.55, 0.44, 0.33 and 0.26ppm respectively.

Histopathological Study

In histopathological study, there is a significant changes in the architecture of different tissues like gills and ovary at acute concentration 0.26ppm(96hrs LC50) has been observed. After acute exposure ie. 0.26ppm gill showed significant changes. There is fusion of secondary gill lamellae (Fig2). Curling of secondary gill lamellae has also been observed. In some places epithelial cells have got hypertrophy. Primary gill lamellae has got bulging. Degeneration and reduction of secondary gill lamellae has also been observed (Fig. 2). After chronic exposure 0.052ppm ($1/5^{th}$ LC50 of 96 hrs.TBTO) there is a significant changes in architecture of gills has been observed. There is a swelling of pillar cells and swelling on chloride has been observed

(Fig. 3). After exposure of gill at sublethal concentration 00.026ppm ($1/10^{th}$ LC50 of 96 hrs. of TBTO) windining of inter lamellar distance has been found in the gill (Fig 4). Ovaries showed significant changes like complete absorption of oocyte, atretic condition of oocyte, cytoplasmic liquification and broken zone of radiate when exposed to acute concentration at 0.26ppm (96hrs LC50 of TBTO, Fig 6). After exposure at chronic concentration 0.052ppm ($1/5^{th}$ LC50 of 96 hrs.TBTO) the ovarian wall has found thick. There is a complete absorption of oocyte.follicle theca wall has been proliferated (Fig 7). After exposure chronic concentration 00.026ppm ($1/10^{th}$ LC50 of 96 hrs. of TBTO) detachment of follicle from lamellae has been observed. Cytoplasmic liquification also observed due to the effect of TBTO (Fig 8).