



## STUDIES ON THE EFFECT OF ZINC TOXICITY IN THE TOTAL PROTEIN CONTENT OF TILAPIA MOSSAMBICA

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### ABSTRACT

*Tilapia mossambicus* was uncovered sublethal grouping of zinc for a time of 14 days after assurance of 96 hr deadly portion. Protein substance and cancer prevention agent chemicals were surveyed in liver tissue of the fishes presented to zinc. Protein substance in the liver lessened radically following 14 days of presentation to zinc. The consequences of these investigations proof that the biochemical reaction are subject to pressure, sort of species and presentation time. The discoveries uncover that substantial metals make hurtful impacts by creating receptive oxygen species that harm the cells. Results additionally recommend that the substantial metals could make atomic edifices with center protein thiols and create poisonous consequences for the cell towards brokenness. Be that as it may, it could be counteracted the creation of cancer prevention agents to stifle the free radicals and ensure the cells against oxidative harm.

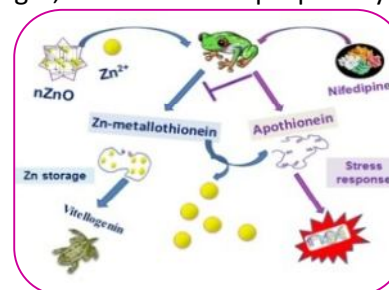
**Keywords:** *Tilapia mossambicus*, Zinc, Antioxidants, Oxidative damage.

### INTRODUCTION

Contamination of nature is a point of national and global and worry as of late. Oceanic biological communities are being debased quickly by xenobiotics of varied nature. Freshwater island biological community like stream, lakes, lakes, bitter water zones are containers for sullies from agribusiness, aquaculture, industry and human settlements. Both inland and waterfront biological systems are free in nature. These biological systems are cardinal houses amphibian creatures of business, tasteful and natural significance.

Bitter waters and streams fill in as fundamental reason for blade and shell angles. The materials put into inland water bodies are exposed to modification because of different normal power and procedures bringing about the show develop contaminants requesting consistent observing and reconnaissance. This is fundamental for building up and early cautioning framework and to give dependable information to natural administration. Overwhelming metal contamination is a noteworthy issue in the oceanic condition in view of the danger, determination propensity to collect in the life forms and experience natural way of life intensification (Weis and Weis, 1977).

Substantial metals are brought into sea-going environment through different courses, for example, mechanical effluents and squanders. Agrarian pesticides keep running off residential landfills and mining exercises (Merian, 1991). Expanded release of overwhelming metals into regular



sea-going biological system open oceanic living beings to unnaturally elevated amounts of these metals (Van Dyk et al. 2007). Among amphibian creatures, angle can't escape shape the negative impacts of this contaminations and are along these lines commonly viewed as the most important life forms for contamination checking in oceanic biological communities (Vander Oost et al. 2003).

## MATERIALS AND METHODS

### *Tilapia mossambica*

Tilapia have genuinely regular, along the side packed, profound body shapes. The body is secured with generally expansive, cycloid scales, which are not effortlessly removed. The dorsal and butt-centric balances have hard spines and delicate beams. The pectoral and pelvic blades are vast and more front in a propelled setup. This character furnishes the fish with incredible authority over swimming and maneuvering. Tilapia bodies are by and large described by vertical bars, one quelled hues and with little complexity over the body hues. This furnishes the fish with a humble capacity to change their hues, because of worry, by controlling skin, spoken to by unmistakable nares and an obviously noticeable parallel line. The eyes are likewise generally substantial, giving the fish a great visual capacity.

Tilapia live and flourish in warm waters and can't get by for long in temperatures beneath 600 F. Without a doubt, they require tropical-like conditions, with water temperatures between 760 to 840 F. They incline toward crisp water, for example, lakes and streams, which have low convergences of salt.

### Experimental Animals and maintenance

Freshwater *Tilapia mossambica* (Plate-I) was utilized as the exploratory model to assess the poisonous quality of metals. The fish utilized in this trial were exchanged from regular lakes around Arakonam region and purchased to the research center and accustomed for 7 days to lab conditions in tub aquaria each estimating (60cm x 30cm x 30cm) loaded up with 25 liters of dechlorinated tap water with aerator fitted to the aquaria for ceaseless oxygen supply. The aquaria were sanitized with potassium permanganate arrangement and washed completely preceding prologue to keep any parasitic contamination. Bolstering was halted 24 hours before the initiation of the poisonous quality test to keep the creatures pretty much in the equivalent metabolic state.

Starting mean weight and length of the fish were 20-28 gms and 8-12 cm individually. The fishes were kept up in ordinary light dull period and room temperature.

## PLATE I

### Morphology of *Tilapia mossambicus*



### Metal toxicity and Determination of Lethal Concentration (LC<sub>50</sub>)

Intense lethality tests were directed for 96 hours utilizing a static bioassay method. Five gatherings of 10 angles each were set up in triplicates for the LC<sub>50</sub> computation. The LC<sub>50</sub> bioassay

technique included the introduction of the five gatherings of fishes to a scope of five distinct groupings of Zinc chloride. The focus at which around half survival/mortality happened following 96 hours was taken as the middle deadly fixation. The dead fishes were expelled quickly from the aquaria to maintain a strategic distance from oxygen consumption. Mortality, conduct and morphological changes were recorded.

The fishes were kept up in a tight range grouping of 10,12,14,16,18 mg/L Zinc individually. The 96 hour LC50 was controlled by Probit investigation strategy (Finney, 1971). The LC50 was observed to be 14 mg/L. One-tenth (1.4 mg/L) was taken as the sublethal fixation for the examination. Investigations were directed utilizing sublethal and toxicologically safe centralizations of zinc for 14 days.

## ESTIMATION OF BIOCHEMICAL CONSTITUENTS

### Estimation of Total Protein (Lowry, 1951)

0.5 ml of the tissue homogenate supernatant was made upto 1.0 ml with water. 4.5 ml of basic copper reagent was added to every one of the cylinders including the clear. Clear was set up by taking 1.0 ml of refined water. 500  $\mu$ l of standard was likewise treated also. Subsequent to blending, the substance were left to represent 10 minutes at room temperature, at that point 0.5 ml of weakened Folin's-Phenol reagent was included. The blue shading created was perused at 640 nm following 20 minutes in a Shimadzu-UV-unmistakable spectrophotometer.

## STATISTICAL ANALYSIS

The information gathered on the distinctive parameters of the trial examine were exposed to measurable investigation (Snedecor and Cochran, 1989) by Mean  $\pm$  SD (Snedecor and Cochran, 1989). The factual criticalness was tried at 1% and 5% levels.

**Null Hypothesis (H<sub>0</sub>)** - True difference in means is equal to 0 (No significant difference between the two groups)

**Alternative Hypothesis (H<sub>1</sub>)** - True difference in mean is not equal to 0 (There is significant difference between the two groups)

## DISCUSSION

The liver tissue in fish are all the more frequently prescribed as an ecological marker of water contamination than some other organs. The toxicants cause an unsettling influence in the physiological condition of the fish which influences the chemical movement. Gathering and biotransformation of xenobiotics in fish can be metabolic exercises of liver (Vander Oost et al., 2003). It at that point causes widening as the cell organelles, which may prompt the height in the movement of different catalysts. To weaken the negative impacts of ROS angle groups a cancer prevention agent safeguard framework like different vertebrates that uses enzymatic and non-enzymatic components. The cancer prevention agents secure the creatures against oxyradical harm, for example, DNA strands breaks, protein oxidation and the acceptance of lipid peroxidation (Winzer et al. 2000). The metal harmfulness animates the oxidative pressure and cancer prevention agent catalysts are instigated as a guard system.

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