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RESEARCH ARTICLE!!!

CADMIUM TOXICITY: FOCUS ON BIOACCUMULATION, OXIDATIVE STRESS INDUCTION AND AMELIORATION WITH CALCIUM AND SELENIUM IN THE SELECTED TISSUES OF FRESH WATER TELEOST *OREOCHROMIS MOSSAMBICUS (TILAPIA)*

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KEYWORDS:

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ABSTRACT

Cadmium (Cd) is an extremely toxic metal with no known biological function in humans and

animals. Due to increased human activities, Cd has become one of the most hazardous heavy metals in aquatic environments and could threaten aquatic organisms including fish. The present study was carried out to know the protective effects of calcium (Ca) and selenium (Se) in reducing the Cd bioaccumulation and Cd induced oxidative stress in liver and kidney of fresh water fish, *Oreochromis mossambicus*. After acclimatization, fish were exposed to sub lethal concentration of Cd ($1/10^{\text{th}}$ of $LC_{50}/48\text{h}$, i.e., 5ppm) for 7, 15 and 30 days (d) period. 15d Cd exposed fish were divided into three groups. The first group of fish were subjected to Ca (1ppm) supplementation, second group received only Se (1ppm) supplement and third group of fish were supplemented with the combination of both Ca and Se at the above said doses and observed for 7, 15 and 30d time periods. After specific time intervals, liver and kidney tissues were isolated and used for Cd bioaccumulation studies and assay of oxidative stress enzymes like catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (GPx) and glutathione-S-transferase (GST) activity levels and glutathione (GSH) content in the test tissues. Lipid peroxidation (LPO) levels were also measured in the test tissues both before and after trace element supplementation to the test fish. Cd concentration levels significantly increased in the test tissues with increased period of exposure. Maximum Cd accumulation was found in 30d Cd exposed fish kidney tissue ($22.611 \pm 0.676 \mu\text{g} / \text{gm}$ wet wt. of the tissue). Results showed significant elevation of LPO levels with decreased activity levels of CAT, SOD, GPx, GST and GSH during Cd intoxication. However after supplementing with Ca and/or Se, there was significant reversal in the above said parameters. The present study reveals that individual supplementation of Ca tends to detoxify the Cd body burden in the test tissues than the other modes of supplementation.