

Therapeutic role of zinc and calcium against cadmium induced alterations in the selected tissue oxidative stress enzymes of fresh water teleost, *Oreochromismossambicus*(*Tilapia*)

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ABSTRACT:

Cadmium (Cd) causes numerous toxic manifestations in man and many aquatic forms. The present study is carried out to investigate Cd induced alterations in the lipid peroxidation (LPO) and antioxidant enzymes such as superoxide dismutase (SOD), catalase (CAT), glutathione-S-transferase (GST) and glutathione peroxidase (GPx) in liver, kidney, gill, brain and muscle of fresh water teleost, *Oreochromismossambicus*(*Tilapia*) exposed to Cd before and after supplementation with trace elements like zinc (Zn) and/or calcium (Ca). Fish were exposed to cadmium chloride (CdCl_2) at a sub lethal concentration of $1/10^{\text{th}}$ $\text{LC}_{50}/48\text{h}$ i.e. 5ppm of Cd for 7, 15 and 30 days(d) duration. 15d Cd exposed fish were then supplemented with trace elements like Zn (1ppm) and Ca (1ppm) individually and in combination for another 7, 15 and 30d time periods. After the specified exposure periods the test tissues were isolated and used for the assay of oxidative stress enzymes as well as LPO. A significant elevation in LPO levels with decreased activity levels of SOD, CAT, GST and GPx were observed during Cd exposure. With Zn and / or Ca supplementation, a significant reversal in the oxidative stress enzymes was observed. Maximum decrement in LPO level was found in 30d brain tissue ($5.077 \pm 0.106 \mu$ moles of MDA formed / gm wet wt. of the tissue) under Ca alone supplementation. Our findings clearly evidenced that the Ca alone supplementation is very effective in reducing the Cd toxicity when compared to other modes of supplementation to the teleostean fish *Oreochromismossambicus* (*Tilapia*).

Keywords: Cadmium, Oxidative stress enzymes, Trace elements supplementation, Fish

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