Oxidative Stress Responses in Goldfish (*Carassius auratus*) Induced by Zinc Sulfate ($ZnSO_4$)

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Abstract
The current research aimed to examine the effect of zinc sulfate ($ZnSO_4$) on antioxidant capacity in goldfish (*Carassius auratus*). Juvenile goldfish (3.3 g) were fed purified diets based on casein as a protein source and containing different levels of supplementary zinc sulfate (0, 25, 75 and 150 mg $ZnSO_4$/kg diet) for 60 days. The results showed that fish fed a diet supplemented with 150 mg kg^{-1} Zn had a significance ($P<0.05$) greater antioxidant amount than those fed diets of 0, 25 and 75 mg kg^{-1}zinc sulfate. $ZnSO_4$ increased significantly superoxide dismutase (SOD), catalase (CAT) and glutathione (GSH) activities. In brief, our findings indicate that $ZnSO_4$ could increase fish antioxidant activity and stimulates physiological parameters in goldfish.

Keywords: Goldfish, Oxidative Stress, Zinc Sulfate