Abstract

In this study were evaluated different concentrations of nanoparticles of copper oxide (CuO NP_S) on hematological indexes and liver enzyme activities of grass carp (*Ctenopharyngodon idella*). First, fish exposed different concentrations of copper oxide nanoparticles for 96 hours and were recorded daily losses to determine LC_{50}. As a result, the concentration of lethal toxicity (LC_{50}) nano copper oxide for grass carp was obtained 2589.14±0.5 (mg/l). Then the fish exposed under sub-lethal concentrations (1/20, 1/30 and 1/50 concentration LC_{50}) copper oxide nanoparticles for 10 days that were measured hematologic indices such as the number of red blood cells, white blood cell count, hematocrit and liver enzymes activity, such as ALT, AST, ALP and LDH in fish blood serum. The results showed that the nano-particles causes various changes in the blood parameters of the fish that these changes was affected by the nano-particles in blood indices by reducing the level of red blood cells (RBC), Hematocrit and increase in white blood cells (WBC) and liver enzymes in treatment groups (p<0.05). Except, ALT enzyme was not significantly different (p>0.05). The highest ALT, LDH, ALP and AST were observed 3±0.001 (U/L) on the seventh day, 1379±2 (U/L), 130±5.6 (U/L) in concentrations 1300 (mg/l) on the tenth day and 216±9.7 (U/L) in concentration 900 (mg/l) treatmeant respectively, and the lowest were recorded for all the enzymes in control group. Hematological indices showed that copper nanoparticles have high impact on performance and the amount of blood cells in fish. The increase in the amount of enzyme indicating damage and dysfunction of tissues.

Key words: Copper oxide nanoparticle, Hematocrit, Liver enzymes activity, Sublethal toxicity.

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Determining of LC_{50} of copper oxide nanoparticles (CuO NPs) on Grass carp (*Ctenopharyngodon idella*) and its effect on hematological and liver enzymes activity parameters

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