

ABSTRACT

Effects of copper, iron, nickel and zinc intoxication were studied on the farmed fish *Cirrhinus mrigala*. Sublethal concentrations of the four metals were given to the fish in two phases i.e., acute and chronic phase. For acute phase, 4 groups A, B, C and D were made for each metal. Group A served as control while groups B, C and D received 1.0 mg/l, 1.25 mg/l and 1.5 mg/l of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, respectively. In chronic phase, the fish were exposed to 0.5 mg/l of the metal for 32 days. The influence was studied on TEC, TLC, Hb concentration, Hct, blood indices, total proteins, albumins and globulins. There was a reduction in TEC, Hb concentration, Hct, MCV, MCH, MCHC, increase in TLC and alteration in the total proteins level. The level of copper increased in blood. For $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$, in acute phase, groups B, C and D received 55 mg/l, 65 mg/l, 75 mg/l of the metal respectively. In chronic phase, the fish received 27.5 mg/l of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ for 32 days. There was an increase in TLC, decrease in TEC, MCH, MCHC and alteration in the total proteins concentration. An increase was observed in the level of iron in blood. For $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$, in acute phase, groups B, C, D received 60 mg/l, 70 mg/l and 80 mg/l of nickel chloride, respectively. In chronic phase, fish were exposed to 20 mg/l of the metal for 32 days. The TLC and MCV increased, TEC, Hb concentration, Hct, MCH, MCHC and concentration of total proteins also decreased. An increase was observed in the level of nickel in blood. For ZnCl_2 , in acute exposure, groups B, C and D received 8 mg/l, 10 mg/l, 12 mg/l of the toxicant respectively. In chronic phase, 5 mg/l of zinc chloride was given to the fish for 32 days. The TEC and TLC showed alterations, Hb concentration, Hct, MCV, MCH, MCHC and total proteins concentration decreased. The level of zinc increased in blood.