



Research article

Sodium fluoride induced alterations in hematological parameters and oxygen consumption in Indian major carp *Labeo rohita* (Hamilton) as biomarkers of fluoride toxicity

Vijaya Lakshmi Sajja^{*1}, K. Sambasiva Tilak²

¹Associate Professor (Retd.), T. J. P. S. College, Dept. of Zoology, Guntur-522006, Andhra Pradesh, India.

²Professor (Retd.), Former Dean of Natural Sciences, Nagarjuna University, Dept. of Zoology, Nagarjunanagar, Guntur-522510, Andhra Pradesh, India.

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***Corresponding Author:** Vijaya Lakshmi Sajja, Associate Professor (Retd.), T. J. P. S. College, Dept. of Zoology, Guntur-522006, Andhra Pradesh, India.

Cell: 9848995914,

E-mail: vijayalakshmisajja@yahoo.com

Abstract

Fish *Labeo rohita* was exposed to a concentration of fluoride 66.976mg/l for a period of 7 days and 15 days only to study the effects of fluoride on hematological parameters and the respiratory behaviour. Due to the manifestation of the toxic action the important blood parameters that were altered are erythrocytes, Haemoglobin, haematocrit, Packed Cell Volume and Mean Corpuscular Haemoglobin, and the Mean Corpuscular Haemoglobin concentration. When exposed to sodium fluoride for 7 days the values of RBC 2.552 ± 0.38 MC/mm, Hb% 6.08 ± 1.140 , PCV 15.06 ± 3.00 , MCV 58.65 ± 5.685 , MCH 23.802 ± 2.315 compared to control. After 15 days of exposure to sodium fluoride the decreased values are, erythrocytes 2.94 ± 0.11 , Hb 6.56 ± 1.26 , PCV 15.6 ± 2.85 , MCV 51.82 ± 5.26 and MCH 22.52 ± 2.54 compared to control. MCHC values are increased as 40.504 ± 2.82 for 7 days exposure and 42.05 ± 2.79 for 15 days exposure compared to control. The changes in the poikilotherm blood of the fish having branchial heart have profound bearing on the oxygen consumption of the fish. The fish was exposed to less than LC_{50} , LC_{50} and more than LC_{50} concentrations of fluoride for 6 hours and 12 hours. The oxygen consumption of the fish was reduced when compared to control. After 12 hours there is significant reduction in the oxygen consumption of the fish *Labeo rohita*. The decrease in the hemoglobin levels, results in lowering the oxygen intake capacity of the fish.