**MONITORING THE BIOCHEMICAL AND HISTOLOGICAL CHANGES IN *Cyprinus carpio* TREATED WITH ZINC OXIDE NANOPARTICLES**

Department of Life Sciences, KFUEIT , Rahim yar khan

**Hira Asad and Dr Tanveer Ahmed**

**Abstract**

Zinc oxide nanoparticles (ZnO-NPs) are among the most widely used nanoparticles (NPs) in the modern period. Nanoparticles (NPs) are thought to pose a serious concern to aquatic ecosystems. This study investigated the impact of varying concentrations (0.1, 1.3, and 2 mg/L) of Zinc oxide nanoparticles ZnO NPs on *Cyprinus carpio* (Common carp) during a 14-day exposure trial. This study aimed to analyzed the biochemical, histological and hematological effects, as well as the alteration occurred in gills, intestine, and kidney of the fish species. Evaluation of hematological parameters provided insights into potential alterations induced by ZnO NPs exposure. Significant alterations in the Erythrocyte count, hemoglobin, and Hematocrit levels were found during the hematological investigation, suggesting possible negative effects on the fish's capacity to carry oxygen. When compared to the control group, the number of lymphocytes, EOSO, monocytes, and platelets in the Zn-NPs-exposed groups dramatically increased. Considerable changes in blood total protein, albumin, globulin, and the level of glucose were found in the biochemical analysis, suggesting that the fish's intestine, gills, and kidneys may have been harmed. Histological examinations of the gills, intestine, and kidney were conducted to assess any structural modifications or pathological changes resulting from exposure to different ZnO-NPs concentrations. The findings from this study shed light on the biochemical and histological effects of zinc oxide nanoparticles on *C. carpio*, contributing to a better understanding of the potential risks associated with nanoparticle exposure in aquatic environments. The results highlight the need of regulating the use of these nanoparticles as well as their disposal in order to reduce the potential impact that they could have on aquatic ecosystems and on public health. Finally, the study adds to our knowledge of the potential risks associated with ZnO-NPs use in many industries and offers important new information regarding the toxicological effects of these nanoparticles on aquatic life.

**Keywords:** Zinc oxide nanoparticles, *Cyprinus carpio*, Hematology, Biochemical and Histological parameters