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COMPARATIVE TOXICITY OF CuO NANOPARTICLES AND $CuSO_4$ ON TROUT ERYTHROCYTES

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In this study we compare the toxicity of two different copper compounds, CuO nanoparticles (NPs) and soluble CuSO4, on erythrocytes from rainbow trout (Oncorhyncusmykiss).

The crystal structure of CuO nanoparticles was analyzed by XRD and the results indicate that the nanoparticles are Tenorite, a monoclinic copper oxide. Further characterization of the nanoparticles was determined by SEM high resolution images, BET technique, Dynamic light scattering and Zeta potential measurements.

The "in vitro" toxicity results indicate that both copper compounds increase the haemolysis rate in a dose dependent way but, a reduced effect was observed treating cells with CuO nanoparticles. Moreover, both copper compounds induce DNA damage and the entity of the damage, similar to haemolysis, was more marked when cells were treated with CuSO4.

"In vivo" results, obtained after intramuscular injection of the two different compounds, show a significant increase in plasma Cu concentration after 15 h from the injection of CuSO4, whereas no significant variations were observed in plasma Cu concentrations after CuO injection. Significant DNA damage with respect to the control was detected only when copper was injected as CuSO4. The data obtained are important for the analysis of environmental risks due to copper exposure, in particular CuO nanoparticles, on fishes.