Evaluation of acute toxicity of copper and nickel on *Daphnia magna*

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Abstract

Copper and nickel are of essential trace elements, which could be entered into aquatic ecosystems through various ways due to their broad applications in agriculture and industrial activities. The acute concentrations of these metals results in aquatic animal death and therefore, removing the planktonic community of aquatic environments. This, in turn, accounts as a serious threat to other living organism through eliminating the first trophic level of a food chain. In this study, we investigated the copper ($CuSO_4.5H_2O$) and Nickel ($NiSO_4.6H_2O$) toxicity effects on *Daphnia magna* neonates as a model in ecotoxicology in 2016. To address that, 60 neonates were individually exposed to 6 different concentrations of copper, including zero or control, 0.4, 0.6, 0.9, 1.35 and 2.25 µg/l, and 6 different concentrations of nickel, including zero or control, 18, 32, 58.32, 104.98 and 188.96 µg/l for 48h. According to the OECD protocol no. 202; immobilization was determined following 6, 24 and 48 h time intervals. The obtained results indicate that EC_{50}-24 and -48 h for copper were 0.931 and 0.667 µg/l respectively. The EC_{50}-24 and -48h for nickel were obtained 163.24 and 50.06 µg/l respectively. In conclusion, our findings showed that copper is more toxic than nickel in the case of *D. magna* neonates. Therefore, due to widespread use of copper as an antiseptic on fish farms, more attentions should be paid into the consumed concentration of this metal. This will likely prevent removal of zooplankton community in fish ponds as well as aquatic ecosystems.

Keywords: copper, nickel, neonate, *Daphnia magna*, $EC_{50.}$