ABSTRACT

Background: Artemia urmiana are small crustaceans that because of its non-selective filter feeder pattern potentially may absorb high level of heavy metals through their living environment. In this study, the effects of different levels of cadmium and copper on survival, catalase activity and metals bioconcentration rates in A. urmiana nauplii have been investigated.

Methods: The research was carried out in February 2012 at University of Tehran, Tehran, Iran. First experiment was conducted in nine concentrations with six replication, then LC$_{50}$ and probable interactions between experimental metals were evaluated. In the second experiment, concentrations of metals absorbed by Artemia and catalase activity were measured based on the acute toxicity indices, including NOEC, LOEC and LC$_{50}$ at individual and mixed concentrations.

Results: The toxicity of copper sulphate (LC$_{50}$= 29.87) was 2.5 times greater than cadmium chloride (LC$_{50}$=79.08) and the toxicity interaction between cadmium and copper was synergistic. The rate of copper uptake in Artemia was higher than cadmium and increased concentration of heavy metals significantly decreased the bioconcentration factor. Comparison of mixed and individual concentrations showed that cadmium significantly decreased copper uptake, while it seems that cadmium bioconcentration was improved consequently. Biochemical analysis showed that the catalase activity was affected undesirably in different individual and mixed concentrations; however, these changes were not significant.

Conclusion: A. urmiana nauplia seems to be highly resistant toward cadmium and copper in their culture medium and demonstrated excessive potential for uptake of heavy metals from their rearing environment.

Keywords: Artemia Urmiana Nauplii, Bioconcentration, Catalase Activity, Heavy Metal, Survival.