World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:18, No:02, 2024

Biomphalaria alexandrina Snail as a Bio-Indicator of Pollution With Manganese Metal and Its Effect on Physiological, Immunological, Histopathological Parameters and Larvicidal Potencies

Authors : Amina M. Ibrahim, Ahmed A. Abdel-Haleem, Rania G. Taha

Abstract : Metal pollution results in many dangerous consequences to the environment and human health due to the bioaccumulation in their tissues. The present study aims to measure the bioaccumulation factor of the Manganese (Mn) heavy metal in Biomphlaria alexandrina snails' tissues and water samples. The present results showed the concentration of Mn heavy metal in water (87.5 mg/l) and its bioaccumulation factor in Helisoma duryi tissue was higher than that in tissues of Physa acuta and B. alexandrina snails. Results showed that 87.5 mg/l Mn concentration had miracidial and cercaricidal activities. Also, this concentration decreased the mean total number of the hemocytes after exposure for 24h or 48h, while increased both the mean mortality and phagocytic indices of the hemocytes of exposed snails. It caused alterations in the cytomorphology of the hemocytes of exposed snails after 24 or 48h, where, the granulocytes had irregular cell membrane, and forming pseudopodia. Besides, both levels of Testosterone (T) and Estradiol (E) were increased after exposure to 87.5mg/l Mn metal compared to the control group. Also, it increased MDA (Malonaldehyde) and TAC (Total antioxidant capacity) contents, while, decreased SOD (superoxide dismutase). Besides, it caused great histopathological damages in both hermaphrodite and digestive glands, represented in the degeneration of the gonadal, digestive, secretory cells and the connective tissues. Therefore, B. alexandrina might be used as sensitive bio-indicator of pollution with Mn heavy metal to avoid ethics rules; beside they are easily available and large in number.

Keywords : manganese metal, B. alexandrina, hormonal alterations, histopathology
Conference Title : ICEEB 2024 : International Conference on Ecology and Environmental Biology
Conference Location : Jeddah, Saudi Arabia
Conference Dates : February 19-20, 2024