
Studying the chronic effects of silver nanoparticles on survival, growth rate and reproductive traits of Urmia Lake Artemia (*Artemia urmiana*)

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Abstract

The application and environmental hazards of nanotechnology to aquatic species are increasingly growing. To address the issue, the present study was designed and carried out to elucidate the toxic effects of silver nanoparticles on growth, survival and reproductive traits of *Artemia urmiana*. The experiment consisted of five treatments, namely control group and those exposed to 0.001, 0.01, 0.1 and 1 mgL⁻¹ silver nanoparticles, with four respective replicates. To do so, 500 newly hatched nauplii were counted and transferred to 1 liter containers exposing to various concentrations of the silver nanoparticles. Microalgae *Dunaliella tertiolecta* and zymogenic was used to feed artemia. Growth and survival rates were recorded on days 8, 11, 17, 20 and 23. After sexual maturation, artemia were transferred to a new environment free from nanoparticles and their reproductive traits were studied. Results showed that higher concentrations of silver nanoparticles led to lower survival rate and augmented growth rate of artemia ($p < 0.05$). Regarding reproductive traits, group exposed to 1mgL⁻¹ silver nanoparticles showed the lowest total offspring, offspring per day, offspring per brood and life span ($p < 0.05$). In conclusion, the discharge of silver nanoparticles even at lower concentrations would undesirably influence reproductive cycle of *A. urmiana* and result in lower survival and reproductive performance of the animal.

Keywords: Silver nanoparticles, Growth, Survival rate, Reproductive traits, *Artemia urmiana*

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