

The Effect of Nanosilver Particles on the DNA Sequence of *Daphnia magna* across Multiple Generations

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Recently, microscopic silver particles called nanosilver were discovered in bodies of fresh water such as lakes, rivers, and streams. Nanosilver can be found in many man-made consumer products like makeup, clothes, and food packaging because of their antimicrobial properties. *Daphnia magna* are a type of microcrustacean that is an ecological indicator species, which can show the overall effects of these particles on itself and the environment. *Chlamydomonas reinhardtii* was grown for 4 weeks. After the 4 weeks, the algae was equally divided into 10 tanks. Tanks 1, 2, 3, and 4 are control tanks, no nanosilver was added to them. Tanks 5, 6, and 7 are the low nanosilver tanks (.1mM concentration). Tanks 8, 9, and 10 are the high nanosilver groups (1mM concentration). In each tank, 50 *Daphnia magna* were added and held there for around 4 months. A sample was collected of 20 Daphnids from each group and dissolved using a KOH solution and 30% hydrogen peroxide. They were heated overnight and transferred into a different tube diluted with water. Spectrophotometry was performed on each sample. There showed to be a higher absorbance of nanosilver particles in the high nanosilver group when compared to the low nanosilver group. DNA extraction was performed on all 3 groups. PCR was performed on all samples with a GAPDH primer and then sequenced. Results showed a higher amount of differences between the control and high nanosilver group than the control and low nanosilver group. There was a higher mortality rate of the subjects in the higher nanosilver group than the low nanosilver group.. Ultimately, the nanosilver particles showed to have a high toxicity on *Daphnia magna* especially in higher concentrations, causing both a higher mortality rate and genetic mutations.