Investigating the Effects of Nanosilver in Pond Water Quality

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Numerous consumer products, such as sports clothes, makeup, food containers, even prosthetic legs contain tiny silver particles called nanoparticles, which have antibacterial properties. The problem is that the silver nanoparticles are washed away ending up in bodies of water, and little is known about the possible adverse effects of silver nanoparticles on aquatic ecosystems. This project investigates how silver nanoparticles affect the quality of pond water, to make conclusions about how they might come to affect pond life. Water quality was measured through data collection of dissolved oxygen and pH levels in 4 groups, each with different concentrations of nanosilver, including one control group with no nanosilver. The hypothesis was that if different concentrations of silver nanoparticles were added to pond water, all groups with nanosilver particles would show change in pH and oxygen concentration, mainly, Group 3 with 25 µg/L of concentration of nanosilver would have the most significant effect on the dependent variables, due to the nanoparticles' antimicrobial properties, decreasing water quality. The findings of the experiment confirmed the predictions since Group 3 showed an average decrease in dissolved oxygen levels of about 0.10 per day, and in that group pH levels changed to more basic by about 3.5. This indicated that high concentrations of nanosilver in pond water changes pH into significantly more basic levels and decreases levels of dissolved oxygen, decreasing water quality for species that may rely on that source of water, indicating that nanosilver may threaten aquatic life in pond water.

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