



Efficiency of silver nanoparticles against Microbial contaminants isolated from surface and ground water in Egypt

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Abstract:

The bactericidal efficiency of AgNP was evaluated against Total Bacterial Count (TBC), Total Coliform count (TCC) and Total fecal streptococcal Count (TFS) of water samples collected from surface water and ground water. Silver nanoparticles were synthesized in a typical one-step synthesis protocol through chemical reduction of silver nitrate by soluble starch. Silver nanoparticles were characterized using Transmission Electron Microscopy (size) and Atomic absorption spectrophotometer (concentration), the bactericidal efficiency of AgNP was evaluated by application of it in three concentrations 0.1, 0.05 and 0.01 ppm to each water sample, each concentration allowed to interact with bacterial communities of the water for several contact times, namely 5 min. 15 min., 30 min., 1 hr. and 2 hrs., then the bactericidal efficiency of AgNPs was determined by comparing the counting bacteria before and after treatment for each sample. We found that, the higher mean values of TBC, TCC and TFS were detected in surface water than ground water. Also, our obtained results showed that TBC, TCC and TFS exceeding permissible limits. Moreover, the statistical analysis of data showed that application of AgNP at different concentration, the Total bacterial count was significantly reduced in all AgNP-exposed samples when compared with the control group (P

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