



# Bactericidal efficiency of Silver nanoparticle against water contaminants isolated from fish farms water with special reference of some physicochemical parameters of water

Reem Dosoky, Saber Kotb and Mohamed Farghali

## Abstract:

Abstract: The bactericidal efficiency of AgNP was evaluated against Total bacterial Counts (TBC), Total Coliform Counts (TCC) and Total Faecal Streptococcal Counts (TFS) of water samples collected from fish farms water. Our finding showed that the highest concentration of Ag nanoparticle exhibited highest bactericidal efficiency against TBC where after 2 hours contact time, 0.1, 0.05 and 0.01 mg/L Ag nanoparticle was sufficient to inhibit (85.33 %, 71.93 % and 62.19 %) of TBC in fish farms water. Moreover, the results showed that the lowest mean of TCC was at 0.1 ppm of AgNP after 2 hrs. contact time ( $144.21 \pm 99.94$ ), where its antibacterial activity reached to 92.48 % and this percentage of TCC inhibition was higher than the other 2 concentrations at the same times (58.34 % for 0.05 ppm and 31.01 % for 0.01 ppm at 2 hrs.). Furthermore, the results showed that the lowest mean of TFS was the mean of 0.1 ppm of AgNP after 2 hrs. contact time ( $155.50 \pm 60.86$ ) followed by 0.1 ppm after 1 hr. contact time ( $212.46 \pm 97.46$ ). Moreover, the highest concentration (0.1 ppm) produced highest antibacterial activity against TFS and its efficiency reached to 90.48 % followed by 0.05 ppm, which resulted in 87.82 % inhibition of TFS after 2hrs. The mean value of 0.1 ppm at 1hr. nearly equal in their inhibition to 0.05 at 2hrs., while the inhibition of 0.1 at 5 min. was higher than 0.01 at 2 hrs. contact time. Also, our results revealed that there were significant positive correlations between water pH, water hardness, chemical oxygen demand (COD) and TBC, TCC, TFS count, this means that when water pH, water hardness, COD increased there were increase in the bacterial count (decreased AgNP efficiency), while there were significant negative correlations between water temperature and TBC, TCC, TFS, this means that when the water temperature increased there was decrease in the bacterial count (increased AgNP efficiency) and vice versa. Silver nanoparticles proved good efficiency against Faecal bacterial indicators and TBC of water, so we recommend using the silver nanoparticles in the field of fish farms water treatment. To obtain a good efficiency of silver nanoparticles, the fish farms water must be treated to remove water hardness and organic matter before the applications of AgNP.

## Keywords:

Bactericidal- Fish- Microbial- Physicochemical - Silver nanoparticles-water.

## Published In:

Journal of American Science , 2015;11(4) , 9