Original Paper

Antibacterial effect of silver nanoparticles synthesized by green method against the standard strains *Escherichia coli* k12 and *Escherichia coli* 25922

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Abstract

Background and Objective: Nano-sized particles at scale of 1 to 100 nm, called nanoparticles. In addition, the composition and structure of materials is also one of the factors influencing the material properties. With the advent of nanotechnology and due to increasing antimicrobial properties of nanoscale silver it can also be used in the fight against various human pathogens. This study was carried out to evaluate the antibacterial effect of silver nanoparticles synthesized by green method against the standard strains *Escherichia coli* k12 and *Escherichia coli* 25922.

Methods: In this descriptive study, silver nanoparticles were synthesized using *Prosopis farcta* seed exudates and analyzed by UV visible spectrophotometer, X-ray diffraction and transmission electron microscopy. Antibacterial effect of silver nanoparticles was evaluated using broth macro-dilution method. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of silver nanoparticles was determined on the standard strains of *Escherichia coli* k12 and *Escherichia coli* ATCC 25922.

Results: Transmission electron microscopy showed nanoparticles with diameters in the range between 5-35 nm with a maximum frequency range in 20-25 nm. The minimum inhibitory concentrations of bacteria, of *E. coli* k12 and *E. coli* 25922 respectively, were 1.56 and 0.39 µg/ml (ppm) and minimum bactericidal concentrations of 3.12 and 0.78 µg/ml wiring (ppm).

Conclusion: Biological synthesis using *P. farcta* seed is a inexpensive, method and require no energy. Due to the strong antibacterial activity of silver nanoparticles, can be a suitable alternative for disinfectants, disinfection and control of pathogens.

Keywords: Macro-dilution, Minimum bactericidal concentration, Transmission electron microscopy, Minimum inhibition concentration

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Received 20 Jul 2014 **Revised** 12 Nov 2014 **Accepted** 10 Jan 2015

Cite this article as: Khatami M, Azizi Z, Pourseyedi Sh, Najarion O. [Antibacterial effect of silver nanoparticles synthesized by green method against the standard strains *Escherichia coli* k12 and *Escherichia coli* 25922]. J Gorgan Uni Med Sci. 2016; 17(4): 119-124. [Article in Persian]