

3rd International Congress on

Bacteriology and Infectious Diseases

August 04-06, 2015 Valencia, Spain

Biosynthesis of silver nanoparticles using *Pseudomonas fulva*, as a novel silver nanoparticles producing isolate

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Silver nanoparticles (Ag NPs) are the most interesting nanoparticles due to their wide variety of applications in various fields especially biomedical. In contrast, a promising usage of Ag NPs as antimicrobial agent is well known and has already found applications in antimicrobial paint coatings, textiles, water treatment, wound healing, medical devices, and HIV prevention as well as treatment. In this study, we have reported the successful synthesis of silver nanoparticles by *Pseudomonas fulva*, as a novel silver nanoparticles producing isolate. *Pseudomonas fulva*, a silver nanoparticles producing organism was isolated from vinegar. The isolate was confirmed by standard biochemical tests and 16S rDNA typing method. The ability of the organism was evaluated by adding 1 M solution of silver nitrate (AgNO₃) to the microorganism culture medium. Production of the silver nanoparticles was investigated by X-ray diffraction (XRD), spectrophotometry, transmission electron microscopy (TEM), and fourier transform infrared spectroscopy (FTIR) analysis. The biosynthesis of silver nanoparticles was observed with the color change of the microorganism culture medium from yellow to dark brown. The sterile culture medium (without microorganism) supplemented with AgNO₃ was used as a negative control. XRD indicated the silver nanoparticles diffraction peaks which were ranged from 2 θ =30° to 2 θ =80°. A peak at 430 nm for silver nanoparticles was seen by spectrophotometer. TEM micrograph revealed the fairly uniform size and spherical shapes of silver nanoparticles in the range of 50 to 100 nm. FTIR absorption spectra with range of 500 to 3500 cm⁻¹ were also observed for silver nanoparticles. Biosynthesis of nanoparticles by microorganism is a green and eco-friendly technology. In this study, we introduced the novel silver nanoparticles producing isolate (*Pseudomonas fulva*), for the first time. Our study indicated that the isolate has robust potential in production of silver nanoparticles. Further study is required to explore the silver nanoparticles production of *P. fulva*.

Biography

Sajjad Yazdansetad is PhD Candidate in Microbiology at Department of Microbiology, Science and Research Branch University, Tehran, Iran. His main research fields are molecular microbiology and biotechnology. He has presented over 10 papers in conferences. Now, he studies silver nanoparticles as a novel approach in treatment of bacterial infections and biomedical applications.

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