



## Biosynthesis and Properties of Silver Nanoparticles of Fungus *Beauveria bassiana*

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**Abstract: Objective:** The objective of this study was biosynthesis of silver nanoparticles (AgNPs) using *Beauveria bassiana* biomass and characterize them as fungi is very effective secretaries of extracellular enzymes, as culturing and keeping it in the laboratory is very simple. Extracellular secretion of enzymes offers the advantage of obtaining great quantities in a relatively pure state, free from other cellular proteins associated with the organism, and can be simply processed by filtering of the cells and isolating the enzyme for nanoparticles synthesis from cell-free.

**Methods:** The fungus was cultured in sterile conditions in the laboratory to obtain pure strain and reacted with aqueous Silver nitrate (AgNO<sub>3</sub>) for a period from January to march 2016 in order to convert the metal silver particles to silver nanoparticles, a surface Plasmon resonance band was observed at 234 nm in UV-vis spectrophotometer. The morphology and structure of synthesized AgNPs were analyzed by using UV-Visible spectroscopy, scanning electron microscope (SEM), Fourier transform infrared spectroscopy (FTIR) and X-ray diffraction (XRD).

**The results:** From the FTIR analyses showed that the AgNPs have large amount of C-C and O-H bonds. The average crystallite size of the calculated by Scherer's equation, it was 49 nm.

**Conclusion:** From the present study, it can be concluded that *Beauveria bassiana* mycelia extract with neutral pH and appropriate temperature is an effective method in the synthesis of silver nanoparticles. Also, it is able to produce metal nanoparticles and nanostructure via reducing enzyme intracellular or extracellular. The current approach suggests that rapid synthesis of nanoparticles of silver nitrate would be appropriate for developing a biological process for mass scale production of formulations.

**Keywords:** Silver nanoparticles; *Beauveria bassiana*; green synthesis; FTIR ;(SEM).

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