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Abstracts Book

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MECHANISM OF EXTRACELLULAR SILVER NANOPARTICLES SYNTHESIS BY *Stereum hirsutum* AND *Fusarium oxysporum*

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The increasing interest for greener and biological methods of synthesis has led to the development of non-toxic and comparatively more bioactive nanoparticles. Unlike physical and chemical methods of nanoparticle synthesis, microbial synthesis in general and mycosynthesis in particular is cost-effective and environment-friendly. However, different aspects, such as the rate of synthesis, monodispersity and downstream processing, need to be improved. Many fungal-based mechanisms have been proposed for the formation of silver nanoparticles (AgNPs), mainly those involving the presence of nitrate reductase, which has been detected in filtered fungus cell used for AgNPs production. There is a general acceptance that nitrate reductase is the main responsible for the reduction of Ag ions for the formation of AgNPs. However, this generally accepted mechanism for fungal AgNPs production is not totally understood. In order to elucidate the molecules participating in the mechanistic formation of metal nanoparticles, the current study is focused on the enzymes and other organic compounds involved in the biosynthesis of AgNPs. The use of each free fungal mycelium of both *Stereum hirsutum* and *Fusarium oxysporum* will be assessed. In order to identify defective mutants on the nitrate reductase structural gene niaD, fungal cultures of *S.hirsutum* and *F.oxysporum* will be selected by chlorate resistance. In addition, in order to verify if each compound identified as key-molecule influenced on the production of nanoparticles, an *in vitro* assay using different nitrogen sources will be developed. Lately, fungal extracellular enzymes will be measured and an *in vitro* assay will be done. Finally, The nanoparticle formation and its characterization will be evaluated by UV-visible spectroscopy, electron microscopy (TEM), X-ray diffraction analysis (XRD), Fourier transforms infrared spectroscopy (FTIR), and LC-MS/MS.

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