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Influence of growth time and concentration of silver nitrate over the biosynthesis of silver nanoparticles using white rot fungi *Bjerkandera sp.* Anamorph R1

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Statement of the Problem: Currently, silver nanoparticles (AgNPs) are being used in areas such as medicine, catalysis, optics and bactericidal sensors; for this reason, the development of recent methodologies allows a more efficient production of AgNPs with better antimicrobial and antitoxic properties. The obtention of AgNPs by physical methods tend to produce low amounts of nanoparticles, while chemical methods are often dangerous and require the use of stabilizing agents. Biological synthesis from white rot fungi are an alternative to improve these processes and reduce the generation of harmful toxic wastes. This work studies how *Bjerkandera sp*. Anamorph R1 is affected both by growth time as well concentration of silver nitrate ($AgNO_3$) over AgNPs synthesis.

Methodology & Theoretical Orientation: The synthesis of AgNPs was carried out in two ways: bio-reduction of silver ions by proteins secreted in the culture broth, as well as, by absorption of silver atom on the mycelia-pellet; to do so, the fungus was grown for 3-8 days, then the mycelium was separated from the culture broth. Both fractions were mixed with AgNO3 (0.5, 1 and 1.5 mM) evaluated at different time (24h, 48, 72h, 96h, 120h and 144h).

Findings: The action of the capping proteins on the surface of the mycelium played a determining role in the reduction of the Ag+ ion to Ag0 nanoparticles producing a particle size that oscillated between 10-100 nm.

Conclusion & Significance: The operational conditions at which the incubated fungi were maintained improved both the adsorption of the silver ions on the surface of the mycelium and subsequent synthesis of AgNPs. The best synthetic properties were found at 1mM of $AgNO_3$concentration, growth time of 8 days, and incubation time of 144 hours

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