



**GREEN SYNTHESIS OF SILVER NANOPARTICLES USING STARCH AS
REDUCING AGENT AND ITS ANTIBACTERIAL ACTIVITY AGAINST
*Staphylococcus aureus***

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Nanoparticles from noble metals as silver (AgNPs) present different industrial applications and are found in a wide variety of products that have direct contact with the human body as shampoos, soaps, detergent, shoes and cosmetic products. AgNPs have been studied extensively in the past few years by their antimicrobial properties that open new applications in medicine and food industry. However, AgNPs are synthesized from toxic compounds that generate an environmental and biological risk. In this work, we report the non-toxic and eco-friendly biosynthesis of AgNPs using starch solutions with three different concentrations (0.5, 1.0 and 1.5% w/v), processed at 90°C for 12h and stabilized with NaOH. The nanoparticles were characterized by UV-Vis spectrophotometer, ZetaPlus-Zeta Potential Analyzer and scanning electron microscopy (SEM) equipped with energy dispersive spectrometer (EDS). Antibacterial activity of the films and colloidal state of AgNPs again *Staphylococcus aureus* was evaluated. The inhibition results were analyzed by ANOVA followed Tukey test post hoc. The synthesis of AgNPs was confirmed by UV-Vis spectra, where the colloids present a characteristic plasmon resonance band at 410nm, indicating the silver present in nanometric scale. Increasing intensities in the UV-spectra are observed with increasing concentrations of starch concentration. The size of the synthesized silver nanoparticles is 63nm approximately; no significant variation in AgNPs size is observed when the synthesis occurs with different starch concentrations. EDS results confirmed the existence of silver atoms with signal around 3.0keV. Both films and colloidal state of AgNPs synthesized with different starch concentrations present antimicrobial potential to inhibit the growth of *Staphylococcus aureus*, so AgNPs immobilized in chitosan films presented a minor inhibition zone and chitosan film without AgNPs did not present inhibition zone. The result showed that starch solutions in presence of NaOH is a very good bioreductant for the synthesis of AgNPs, this nanoparticles present activity against clinically isolated pathogens as *Staphylococcus aureus*, presenting a high potential for industry applications in food preservation.

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