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Antibacterial activity of biogenic silver nanoparticles against *Salmonella enterica*

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The increase of resistant strains is a major problem in these days. Researchers are testing new antimicrobials, inclusive compounds produced by nanotechnology. *Salmonella* is a genus of bacteria that are a major cause of foodborne illness in the world and are transmitted through contaminated food. In this study, we tested biologically synthesized silver nanoparticles (AgNP_{bio}) against *Salmonella enterica*. AgNP_{bio} were prepared according to a method by Durán et al., 2005. The AgNP_{bio} diameter and zeta potential were determined by photon correlation spectroscopy. Minimal inhibitory concentrations (MICs) were determined by broth microdilution assays in 96-well plates, as suggested by CLSI. The *in vitro* antibacterial activity of AgNP_{bio} was examined against four reference bacterial strains (ATCC), *Staphylococcus aureus* 25923, *Escherichia coli* 25922, *Salmonella typhimurium* UK1 and *Salmonella enteritidis* 13076, and 19 bacteria isolated from chicken. Minimal bactericidal concentration (MBC) was determined by sub-culturing 10 µL from the broth dilution MIC. The AgNP_{bio} presented the size range 81.25 nm, zeta potential -36.4 mV and PI= 0.296. *E. coli* and *S. aureus* with MIC of 39.4 µM while *S. typhimurium* and *S. enteritidis* showed MIC value of 78.7 µM. Isolates from chicken also showed sensitivity for AgNP_{bio} with MIC ranged from 78.7 µM to 157.5 µM, and all bacterial strains showed the MBC ≤ 157.5 µM. The AgNP_{bio} is a great alternative because it was not related to any bacterial strain naturally resistant to silver nanoparticles. Our study suggests that the use of AgNP_{bio} can be effective against *Salmonella enterica* strains, an important food pathogen.

Biography

Meiriele S Neves is a PhD student from Londrina State University, Brazil. She has studied about natural antimicrobials against *Salmonella enterica*. She works with biological silver nanoparticle obtained from *Fusarium oxysporum* and oregano oil. This study can help to develop alternatives to control food contamination. Her interest includes application of AgNP_{bio} in food products and the interaction of this compound with the food.

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