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Antibacterial activity of biosynthesized silver nanoparticle against foodborne pathogenic bacteria Listeria monocytogenes

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Listeria monocytogenes is a Gram-positive human pathogen related to foodborne illness. The organism occurs widely in food, involving meat, poultry, and seafood products that are generally caused by cross-contamination of foods contacting L. monocytogenes-contaminated surfaces. The ability to persist in food-processing environments and multiply under refrigeration temperatures makes this bacterium a significant threat to public health. Food processors have relied on techniques, that include hand washing, high pressure sprays, hypochlorites, iodophores and quaternary ammonium compounds to reduce or eliminate microorganisms on food contact surfaces. Microorganisms that might be on the surface of equipment which may eventually come in contact with raw and processed food should be inactive and remove by these techniques. Even with the use of these techniques, bacteria can persist on equipment and surfaces used in the food industry and may survive for prolonged periods. The periodic problems with Listeria in foods, has stimulated research interest in finding natural and effective preservatives and increasing demand for better-quality disinfection methods due to microorganisms resistant to multiple antimicrobial agents. Silver nanoparticles biological synthetized (bio-AgNP) acts as an antimicrobial substance against a number of pathogenic microorganisms, including food-borne pathogens. The aim of this research was evaluate the antibacterial activity of bio-AgNP against foodborne pathogenic bacteria L. monocytogenes 99-38 strongest biofilm producer. Silver nanoparticle used in these tests were obtained after reduction of silver nitrate by Fusarium oxysporum. Microplate growth inhibition assay was used to verify the inhibitory action of bio-AgNP in different concentrations (1mM, 500uM, 250uM and 125uM) against L. monocytogenes. The results show that high concentrations are able to kill the bacteria, and lower concentration are able to extend the lag phase. Results showed the action of bio-AgNP against L. monocytogenes, suggesting their utilization in various applications particularly as antibacterial substance in food packaging, food preservation to protect against various dreadful foodborne pathogenic bacteria.

Biography

Giovana C Bodnar is a PhD student from Londrina State University, Brazil, and she is doing an internship in Oklahoma State University. She had studied about natural antimicrobials against human pathogens and multi-resistant bacteria. She works with biological silver nanoparticle obtained from *Fusarium oxysporum* and *eugenol*. This study can help to develop another option for treatment. Her interest includes application of this compound which showed synergistic effects and the molecular interaction with bacteria.

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