ANTIMICROBIAL ACTIVITY OF FUNGAL CHITOSAN NANOPARTICLES AS ALTERNATIVE NATURAL COMPOUND TO INHIBIT FOOD PATHOGENS.

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Food pathogens are a significant risk to the health of consumers, besides causing loss of post-harvest food, impacting on food availability over time, causing loss of capital to the food industry. Natural products, as chitosan, a polysaccharide extracted from fungi cell wall, have shown antimicrobial activity, which can be enhanced by the polymer as nanoparticles. Advances in nanotechnology have demonstrated potential application of nanoparticles for inhibit the growth of microorganisms involved in food spoilage or food-borne illness. In this way, the present study has the aim to evaluate the antimicrobial activity of fungal chitosan nanoparticles (FCN) against food pathogens. Chitosan used in the research was courtesy of KitoZyme®. It is a chitosan extracted from mycelial mass of *Aspergillus niger*, characterized as a low molecular weight and deacetylation degree of 89%. The nanoparticles were obtained by ionic gelation technique with sodium tripolyphosphate (TPP). The morphological characterization of FCN was measured by transmission electron microscopy (TEM). The antimicrobial activity of FCN were evaluated against *Salmonella* spp., *E. coli*, *S. aureus*, *P. aeruginosa* and *L. monocytogenes* by microdilution method in BHI broth, and subsequent incubation in BHI agar without substance test, for determine the Minimum Inhibitory Concentration (MIC), and the Minimum Bactericidal Concentration (MBC), respectively. Bacteria were incubated at 37˚C/24h. To MIC was used resazurin staining, as a bacterial growth. The concentration of FCN varied 12.0 to 0.05 $mg.mL^{-1}$. All assays were carried out in triplicate. The FCN presented with spherical shape and size measuring 50nn. FCN demonstrated antimicrobial activity against all tested bacteria, with MIC value of 300$ug.mL^{-1}$ for *Salmonella*, *E. coli*, *P. aeruginosa*, *L. monocytogenes* and 200$ug.mL^{-1}$ for *S. aureus*. FCN also had bactericidal action with MBC value of 600ug. mL^{-1} for *S. aureus*, *E. coli*, *Salmonella*, and 400ug. mL^{-1} for *P. aeruginosa*, and 300ug. mL^{-1} for *L. monocytogenes*. Therefore, the nanoparticles of fungal chitosan analyzed in this study are effective against foodborne pathogenic microorganisms to become an alternative to the food microbiological control.

Palavras-chaves: chitosan nanoparticles, antimicrobial activity, food microbiology.

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