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Antimicrobial potential of biodegradable film of soybean isolated protein and clove (*Syzygium aromaticum* L.) essential oil

Cristiane Mengue Feniman Moritz, Jhenyfer Estefany Vitor and Keila Souza Silva
Maringa State University, Brazil

Considering the tendency to reduce the use of chemical additives in the food industry and the use of sustainable substitutes for plastics, the objective of the research was to test the antimicrobial potential of biodegradable film of soybean isolated protein and clove essential oil (CEO). The concentrations of 0.01, 0.3 and 0.5% of CEO in the biofilm were tested. After biofilms were obtained, they were arranged in circular format (four replicates), with a diameter of 7 mm, aseptically in Petri dishes containing Plate Count Agar (PCA) inoculated with *Listeria monocytogenes* (ATCC 7644) and *Salmonella enterica* subsp. *enterica* serovar. *Typhimurium* (ATCC 13311), incubated at 37°C for 24 hours, and Petri dishes containing Potato Dextrose Agar (PDA) inoculated with *Aspergillus oryzae* (ATCC 1003) and *Penicillium oxalicum* (ATCC 24784), incubated at 25°C for 72 hours. After incubation, the inhibition halos and the means were compared by ANOVA. For *L. monocytogenes*, the control treatment itself had inhibition, mean halo of 12 mm. The biofilms with 0.3 and 0.5% CEO presented halos of 16 and 18.5 mm, respectively, for *Salmonella typhimurium* only treatments 0.3% (12 mm) and 0.5% (14 mm) showed inhibition halos. No inhibition of hyphal growth around the discs was observed for filamentous fungi. However, it was possible to observe that there was no sporulation in the treatment of 0.5% of CEO, with a halo of 12mm for *Aspergillus oryzae* and of 19.5mm for *Penicillium oxalicum*. No sporulation was observed by the color difference of the mycelium. For the two fungi, the development of white hyphae occurred, a pattern different from the growth in the rest of the dishes. The observations point to a potential application of CEO in the formulation of biodegradable film for, in addition to the packaging, prevention and control of contaminants in food.

Biography

Cristiane Mengue Feniman Moritz completed Bachelor's degree at Food Technology (Dairy) from Paraná Federal Technological University (2002), Master's at Food Science and Technology from São Paulo University (2004) and Doctorate at General and Applied Biology from Biosciences Institute, Paulista State University "Júlio de Mesquita Filho" (2011). He has experience in Food Science and Technology, focusing on food microbiology, antimicrobial activity of essential oils, and dairy technology.

crisfeniman@yahoo.com.br

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