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Antimicrobial activity of poly lactic acid films containing nanocellulose & ethanolic extract of propolis against some food borne pathogens

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Active antimicrobial food packaging technology is a novel method that can increase safety or shelf life of food. Recently, biopolymers are increasingly being used as alternatives of conventional plastics. Poly Lactic Acid (PLA) is known as a biodegradable, non-toxic and eco-friendly food packaging material. In this study, antimicrobial effects of poly lactic acid films incorporated with different concentrations of nanocellulose (0 and 1%) and ethanolic extract of propolis (0, 1 and 2%) against *Staphylococcus aureus, E. coli* O157:H7, *Vibrio parahaemolyticus* and *Listeria monocytogenes* were investigated by using disk diffusion technique. Casting method on glass petri dishes were utilized for preparation of PLA films. PLA films containing nanocellulose and ethanolic extract of propolis were cut to circular discs and then were placed on a bacterial lawn. Diameter of inhibition zones were measured after 24 h incubation of plates at 35°C, by using digital caliper and Digimizer software. One-way analysis of variance followed by Tukey's test was used as statistical analysis. Result of this study showed, PLA films containing pure PLA films or films containing only nanocellulose did not show any antimicrobial effect against *Staphylococcus aureus, E. coli, Vibrio parahaemolyticus* and *Listeria monocytogenes*. Also result of this study revealed, by increasing the concentration of nanocellulose and ethanolic extract of propolis (PLA films containing 1% nanocellulose and ethanolic extract of propolis), inhibition zone (Mean±SD) against *Staphylococcus aureus, E. coli, Vibrio parahaemolyticus* and *Listeria monocytogenes* in this concentration were 34.9±4.7, 22.05±2.68, 30.9±5.4 and 27.8±0.5 mm, respectively. The result of this study can improve using of PLA films incorporated with nanocellulose and ethanolic extract of propolis as an Active Antimicrobial Food Packaging.

Biography

Aslan Dalilan has completed Master of Science in Food Safety from Faculty of Veterinary Medicine, University of Tehran with the background of Food Engineering in Bachelor of Science. He is looking for innovative path in food preservation and currently working in edible films which have antimicrobial characters.

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