

Antimicrobial activity of garlic oil bonded to polypropylene

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ABSTRACT:

Food borne diseases are a serious global problem that need to be addressed. These diseases are usually caused by proliferation of micro-organism during storage of either raw, processed or cooked food. Synthetic food additives are usually incorporated to food to inhibit the growth of microorganisms. However, studies revealed that the use of synthetic food additives were linked to more serious ailments. In this study, garlic oil, a natural antimicrobial agent derived from plant was bonded to polypropylene for the development of antimicrobial food packaging. This was done by utilizing the method similar to the incorporation of dye to cellulose. The antimicrobial activity of the product was tested against gram negative bacteria (*Escherichia coli*), gram positive bacteria (*Staphylococcus aureus*) and fungi (*Candida albicans*) based on agar diffusion test to determine its sensitivity to different types of microorganisms. Results of instrumental analysis strongly justified the interaction of components of garlic oil and polypropylene. UV-Vis analysis showed observable differences in the absorbance of bonded and non-bonded samples. X-ray diffraction patterns revealed morphological changes of polypropylene upon interacting with garlic oil. Garlic oil bonded to polypropylene have susceptibility activity against all the microorganisms tested. Moreover, its antimicrobial activity is comparable to garlic oil as depicted by the statistical results. Thus, bonding of garlic oil to polypropylene has no effect on its antimicrobial activity. Hence, it can be further developed as an antimicrobial food packaging agent.

Keywords:

Antimicrobial activity, Garlic oil, Polypropylene, Antimicrobial packaging.