UNIVERSITI TEKNOLOGI MARA

A STUDY ON THE EFFECT OF NANOARTICLES OF GARLIC FOR FOOD PACKAGING

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ABSTRACT

This study conducted to study the effect of garlic food packaging towards food product which is strawberry or any kind of fresh fruits, storage condition and mechanical properties. The food packaging will be incorporated with garlic oil or garlic extraction. Garlic has been chosen to be incorporate in the packaging since it is good in reducing the microbial activity, yeast and mould that might cause food spoilage. In order to produce packaging, the extraction of garlic is performed. The extraction of garlic mixed together with potato starch powder and undergoes heating process with some addition of glycerol. Glycerol will act as a plasticizer for the film making. To form ad film, the mixture undergoes drying process on radiator for a day or in room condition for two days. The analysis for this study is measuring the mechanical properties of the film which is tensile strength, and FT – IR analysis. From FTIR analysis the peak for garlic in distilled water – ethanol extraction is 2160.93 cm^{-1}. It is compare with extraction using distilled water as solvent. From mechanical strength, the tensile strength for plastic contained garlic using distilled water – ethanol is from 0.1656 to 1.063 MPa for 12 days while the tensile strength for plastic contain garlic with distilled water is also increasing from 0.0219 to 0.1156 MPa. Food packaging with incorporation with garlic nanoparticles are among the good packages from the observation made in laboratory. From observation shows strawberry sealed with packaging incorporated with garlic extract still in good condition up to eight days. Therefore, based on result this packaging can be used to extending the shelf-life of the food products and produce biodegradable packaging that might conserve the nature.

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INTRODUCTION

1.1 Summary

This study conducted to study the effect of garlic food packaging towards food product which is strawberry or any kind of fresh fruits, storage condition and mechanical properties. The food packaging will be incorporated with garlic oil or garlic extraction. Garlic has been chosen to be incorporate in the packaging since it is good in reducing the microbial activity, yeast and mould that might cause food spoilage. Food packaging with incorporation with garlic nanoparticles are among the good packages. It can be used to extending the shelf-life of the food products and produce biodegradable packaging that might conserve the nature. The extraction of garlic and potatoes starch are used to produce packaging. The extraction and starch powder mixed together and undergoes heating process with some addition of polyvinyl alcohol or glycerol. Both of glycerol and polyvinyl alcohol will act as a plasticizer for the film making. To form ad film, the mixture undergoes drying process on radiator for a day or in room condition for two days. The analysis for this study is measuring the mechanical properties of the film which is tensile strength, UV – Vis and FT – IR analysis.

1.2 Research Background

Packaging process are the most important part in the food manufacturing process. Packaging basically important to maintain the quality of food product to be stored and transported to consumer. Packaging will prevent the deterioration on the food quality and due to the environmental effects. The packaging also designed to give a specific information about the food, to protects food and make the food handling is more convenient. Another function of food packaging is to accomplish a safe delivery of food until it being consume. Food packaging also helps on extending the shelf life of food and