

UNIVERSITI TEKNOLOGI MARA

**A STUDY ON THE EFFECT OF
ANTHOCYANIN PIGMENT FROM
PURPLE CABBAGE
FOR FOOD PACKAGING**

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ABSTRACT

In developing countries, food spoilage and increase in pollution of solid waste, especially from food packaging. Basically, this problem not only affect the damaging to human being, but also towards environment. Extraction process is used for extracting the desired compound from its natural source, as materials in food packaging technology. Purple cabbage that contain high amount of anthocyanin can be utilized in food packaging production as it bring unlimited number of economic and environmental benefits to the industrial of food. The purposes of this research is to extract anthocyanin pigment from purple cabbage and to study the effect of anthocyanin in food packaging towards storage condition, food product and mechanical properties. Two different type of solvents were used to compare the amount of anthocyanin extract which is distilled water and distilled water-ethanol. The peak for anthocyanin in Fourier transform infrared (FT-IR) from distilled water-ethanol solvent is at 1217.25cm^{-1} . This peak is higher compared to the solvent that used distilled water only. From UV-vis region spectra, both food packaging that contain purple cabbage extract were incorporated into agar and starch films. Based on the effect on food sample, pH indicator film showed the highest colour changes which is from purple to pink when there is a presence of ethanol in the solvent. For the effect of storage temperature, food packaging in temperature 60°C become dried and brittle while food packaging in temperature 4°C still fresh. In term of mechanical properties, the elasticity of film that contain anthocyanin using distilled water-ethanol as solvent is decrease from 0.2813 MPa in day 1 to 0.0341 MPa in day 15 while the elasticity of film that contain anthocyanin using distilled water only as solvent also decrease from 0.4625 MPa in day 1 to 0.0313 MPa in day 15. Overall, pH indicator films that contain anthocyanin from purple cabbage extract has high potential to be used as one of the material in food packaging in order to detect food spoilage since they have reliable response to pH and temperature.

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CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

Recently, development of polymer was used to produce materials like glass or tinfoil as food packaging to replace traditional method. Yet, in packaging, surgery, catering process, there is an issue in hygiene if use for a long period of time. (Souza et al., 2012). This is because high amount of waste produced, where packaging of food is one of the considerable part which some cannot degrade naturally thus remain for a long period of time without decompose.

At present time, food packaging becomes the major concern within the consumer because the function of food packaging itself must act as a protector towards food products. Increasingly the growth of technology, the changes in consumer preferences and demand for safe and high quality food products also increases. This situation lead to innovative developments and improvement of packaging materials.

According to Anupama, Pramod and Rishabha (2011), food packaging was used as to distinguish certain product and the materials used must be in environmental considerations. For example, it does not generate any bad effect on quality of product. The important factor that should be considered is low in price, easy to fabricate and its materials is available.

Food packaging with low capability to protect its product will give bad effect to the product inside that package. As a result, consumers may have problem regarding on how to store or want to keep the food product in a high period of time without losing its quality or freshness of product. They also do not know either the food product is still in good condition or not inside that closed packaging.

One type of intelligent food packaging system is visual pH indicator, due to several advantages like small size, great sensitivity, and low in costing (Choi et.al, 2016). In this research, the method produced and characteristics of intelligent food packaging is to be