UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT & CHARACTERISTIC OF STARCH PROTEIN BASED EDIBLE FILM INCORPORATED WITH TUMERIC ESSENTIAL OIL

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ABSTRACT

The scope of this research is to synthesize and characterize a starch-protein based film incorporated with turmeric essential oil. The film was synthesized using adopted method from journals. The sample produced was characterized by it mechanical properties and solubility properties. These analyze was conducted using Universal Testing Machine for mechanical properties and weight analyzer for film solubility. Different temperature setup during gelatinization process and different turmeric oil concentration were set as manipulated variables for this experiment. The result was tabulated in result and discussion section, based on previous journal the mechanical properties will increase when temperature and concentration of turmeric oil, same trend can be seen for solubility properties. However some studys show the totally opposite result, hence study has been coducted and compared with previous result.

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CHAPTER 1
INTRODUCTION

1.1 Background Study

There are many problems arises before incorporation of biofilm with essential oil was introduced. Examples of them are biodegradable film from starch-gelatin only is easily break due to elongation, poor water resistance and this high likely will be a drawback when they applied this film to food product with high moisture content., The film produced is transparent and has high light transmittance which probably causes the degradation of protein. Meanwhile in term of anti-oxidative properties, the film have low anti-oxidative which will result in high oxidation of protein when the product exposed to surrounding. This was proven that this chemically driven film not environmental friendly mainly because it can cause negative effect toward environment and human, and some of the production even used sustainable sources as their main raw material in film development (ex: crude oil) thus this will not only affect our environment and our health but it also speeded up the depletion of our sustainable sources.

Previously in biofilm industries, they used chemicals materials to develop new synthetic biofilm product. Based on result that have been discovered by scientist, synthetic biofilm also can give serious bad effect, maybe not in first or second years but it will for another six to five years if we continue to consume them in a long term. Thus new method is required to be develop. Other than prevention of bad effect towards our health, usage of natural resources also can enhance the film's characteristic properties. There are three mechanical properties that were considered, tensile strength, young modulus and elongation at break. Tensile strength is an ability of the film to withstand certain load or force without breaking. Incorporation of turmeric oil into the production of film can significantly enhance this properties. Meanwhile, addition of turmeric oil also affected the young modulus properties. Young modulus can be defined as an ability to maintain it original form and it relationship to tensile strength is directly proportional. Higher value of tensile strength resulted in high values of young modulus. Last mechanical properties is elongation at break and it relationship with young modulus and tensile strength are inversely proportional. High tensile strength and young modulus values resulted in lower elongation at break. Elongation at break is a properties where how long the film can stretch before breaking apart.