UNIVERSITI TEKNOLOGI MARA

ISOLATION AND IDENTIFICATION OF ASPERGILLUS NIGER DEGRADING THERMOPLASTIC STARCH FROM COMPOST SOIL.

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ABSTRACT

The study was focused on the degradation by fungi species in. The objectives of the research project were to isolate and identify the fungi that are responsible for the degradation of thermal plastic starch(TPS) from compost soil and also to investigate the growth of fungi and the degradation of TPS film. The source of the fungi was obtained from the isolation of the fungi sp from the compost soil. Primarily, the microbes were identified and isolated from dilute soil compost. The microbes were streaked and let it grow on the selective media which are PDA agar to identify it as a fungi species. At once, TPS were prepared and let the fungi degrade it. The identification of fungi sp by morphological characteristics identified that the fungi sp was *Aspergillus niger.* Starch hydrolysis also were done to indicate the presence of the amylase enzyme that were hydrolyze the starch. The presence of amylase created a clear halos zone surrounding colonies which indicating that the starch was hydrolyzed. Next, the biodegradation of TPS film was investigated based on weight loss of the TPS film. The TPS film showed a decreasing in weight value from 0.8812 g to 0.6289 g during the observation. It can be concluded that, *Aspergillus niger* from compost soil are one of the microorganism that are responsible for the thermal plastic degradation.

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CHAPTER 1

INTRODUCTION

Biodegradation is defined as the biologically catalyzed reduction in complexity of chemical compound in which the organic substances are broken down into smaller compound by living organism. After the completion of biodegradation process, the process of the mineralization will occur. During the process, the microbial organism will transform the substances through metabolic or enzymatic process. During the process several microorganisms including fungi, bacteria and yeast are involved. The final product from the biodegradation frequently is carbon dioxide. In addition, organic material may degrade aerobically with oxygen or anaerobically without oxygen. (Nezha Tahri Joutey et.al, 2013)

Nowadays, the biodegradation of polymers had always been issues since it is related to the environment conditions. The growing of environmental pollution caused by synthetic plastic has led to search of alternative material such as biodegradable thermoplastic starch film (TPS). TPS film can be biodegrade by breaking the large molecules into smaller molecules or fragment. The process will convert the material into biomass, carbon dioxide and water. Primarily, the microbes will be identified and isolated from dilute soil compost. The microbes will be streaked and let it grow on the selective media which are Potato Dextrose Agar. At once, TPS will be prepared and let the fungi degrade it. The biodegradation will be monitored based on the ability on the bacteria to degrade and the time consumption for the process. Apart from that, the fungi also will be isolated and identified. It is predictable from the research that fungi are one of the microorganism that is in charge for the degradation of TPS.