

**UNIVERSITI TEKNOLOGI MARA**

**PRODUCTION OF POTENTIAL  
BIOPLASTIC FROM CORN STARCH  
AND EXTRACTED CELLULOSE  
FROM *Caulerpa lentillifera***

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Thesis submitted in partial fulfilment  
of the requirements for the  
**Bachelor in Science (Hons.) Biology**

**Faculty of Applied Sciences**

**January 2020**

## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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## ABSTRACT

Artificial polymers are essential in several fields of industry, especially in the packaging industry. Yet, it has an unfavorable impact on the environment and is the reasons of accumulation of waste and utilization. Hence, the use of renewable resources, which can reduce waste dumping problems, is being studied to create biopolymer films and coatings. Seaweed and cellulose are promising natural polymers. Green seaweed, *Caulerpa lentillifera* is known for its richness of cellulose. This study aims to produce a bioplastic from corn starch and strengthen with cellulose as filler. The cellulose extracted from seaweed through alkali treatment and acid hydrolysis was confirmed by FTIR characterization. The bioplastic were prepared from corn starch and seaweed based cellulose by using casting method and was revealed to have tensile strength and Young's Modulus significantly rised with the addition of cellulose. However, the elongation at break decreased. The water absorption permeability decreased in addition to cellulose due to enhanced water resistance. Based on the results obtained, the bioplastic film with 10% cellulose concentration gave the highest tensile strength and Young's Modulus value with fine water absorption permeability. Besides, it showed good degradation property. Overall, the combination of starch and cellulose can be used as an alternative in producing bioplastics.

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