

**THE EFFECTS OF PRETREATMENT TIME AND ACID
HYDROLYSIS CONCENTRATION ON BIOETHANOL PRODUCTION
FROM *Eucheuma denticulatum* (N.L. Burman) Collins & Hervey**

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JANUARY 2020

ACKNOWLEDGEMENTS

In the name of Allah S.W.T, the Most Gracious and the Most Merciful for giving me the strength and courage in completing this project and my study in Bachelor of Science (Honors) Biology at University Teknologi MARA Sabah.

First I would like to express my gratitude to my family, especially my parents and siblings who had been supportive and always ready to lend a helping hand throughout completing my studies and project.

A special thanks to my supervisor, Puan Farnidah Hj. Jasnje for all the advices, constructive criticisms, and guidance for me to progress and finally complete this project. I have learned a lot under her tutelage and it has been an honor to work by her side.

Aside from that, I would like to express my sincere appreciation to all the lectures from Faculty of Applied Sciences who offer guides and gave their insights as well as advices to help complete my project.

Last but not least, a thousand thanks to my fellow comrades in arms that support this project. Your ideas, information and motivation are very much appreciated. Finally, thank you to everyone who had directly or indirectly involved in their own way in completing my thesis.

Nur Asyiqin Binti Yunos

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ABSTRACT

THE EFFECTS OF PRETREATMENT TIME AND ACID HYDROLYSIS CONCENTRATION ON BIOETHANOL PRODUCTION FROM *Eucheuma denticulatum* (N.L. Burman) Collins & Hervey

Increasing demand on energy resources and concerns towards greenhouse emissions cause attraction on studies toward biofuels production as it is essential for transportation and as sustainable sources of renewable energy. The objectives of this study is to determine the chemical constituent of *Eucheuma denticulatum* primary metabolites, evaluate pretreatment methods including chemical and heat pretreatment and different acid hydrolysis concentration in production of reducing sugar, and finally evaluation of different concentration of acid hydrolysis for optimization of bioethanol production. The methods used to estimate reducing sugar and bioethanol content were standard physicochemical composition that consists of moisture, carbohydrate and lipid content, phenol sulphuric acid test for reducing sugar estimation and solvent extraction and dichromate oxidation for estimation of bioethanol yield. The result for *Eucheuma denticulatum* physicochemical analyze are moisture content is 34.67%, carbohydrate content is 23.23% which is higher than lipid content of 5.3%. The result for highest production of reducing sugar for *Eucheuma denticulatum* is 285.7 mg/ml which produce the highest yield of bioethanol of 7.12% with the best optimization method of 0.4 M sulphuric acid for acid hydrolysis at 25 minute autoclave time (AT) as pretreatment time. This result proves that *Eucheuma denticulatum* has potential as biomass for bioethanol production and reducing sugar produced that has positive correlation to bioethanol yield. It is recommended to do the analysis on inhibitory product 5-HMF during chemical and heat pretreatment and apply detoxification method to degrade the inhibitory product in order to produce higher yield of bioethanol for *Eucheuma denticulatum*.