

# Bioethanol production from marine algae

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## Introduction

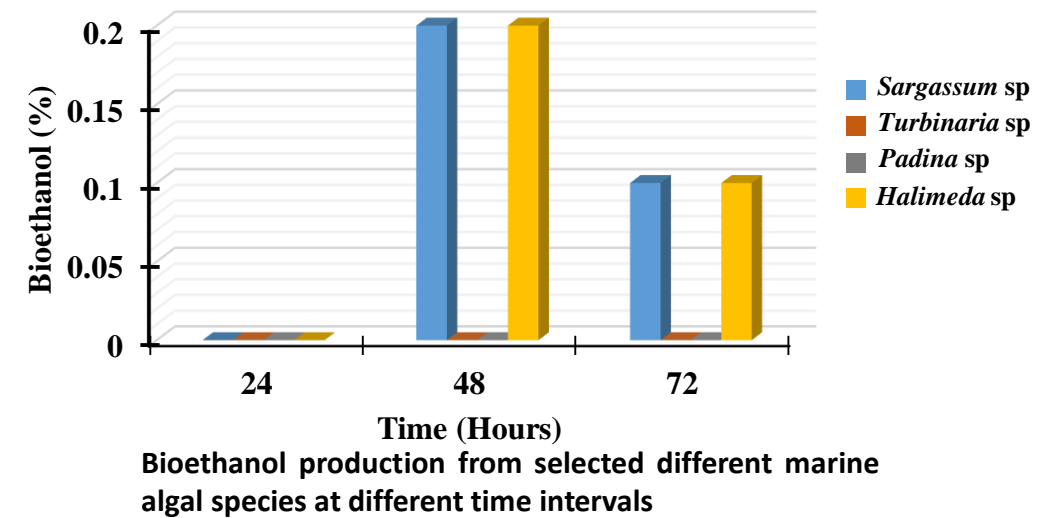
Ethanol is an important chemical product with emerging potential as a biofuel to replace fossil fuels. The objective of the study is to determine the effect of culture and media conditions to increase the yield. Marine algae was chosen for this experiment because of its rapid growth rate, can be grown on non arable land, abundance in all over Sri Lanka and underutilized for bioethanol production.

## Methodology

Four different types of marine algae, *Sargassum sp*, *Turbinaria sp*, *Padina sp* and *Halimeda sp* were evaluated for its bioethanol production. The marine algae were collected from North sea of Jaffna District, Sri Lanka. Samples were cleaned half of the each plant species was dried and crushed to powder and another half was kept as fresh in refrigerator at 4°C. Samples were (30g) subjected to autoclave with distilled water (150mL) then removed the water and followed by 1% H<sub>2</sub>SO<sub>4</sub> (150mL) to release the sugar. Fifty milliliter of fermentation medium contained (L<sup>-1</sup>) 4g (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, 4g MgSO<sub>4</sub> and 8g KH<sub>2</sub>PO<sub>4</sub> was added to treated samples and pH was adjusted to 5.0 with 0.1N NaOH. Fermentation medium was inoculated with 10mL of activated baker's yeast (50g yeast in 50g L<sup>-1</sup> sucrose solution) separately and incubated at room temperature (31±3 °C) and 100rpm in orbital shaker. Samples (50mL) were taken at different time intervals (24, 48 and 72h) and bioethanol activity was measured by ebulliometer.

## Results

There was no bioethanol activity in all fresh algal samples but dried powdered samples of *Sargassum sp* (0.2%) and *Halimeda sp* (0.2%) showed bioethanol activity at 48h of incubation.



## Conclusions

This study shows that above mentioned two seaweeds are potential sources for bioethanol production and these marine algae were selected for further analysis of bioethanol production.