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## Bio-ethanol production from some marine algae by Baker's yeast and mixed culture from palmyrah toddy under submerged fermentation

Vivekanandaraja R.<sup>1</sup>, Arumugam V.<sup>1\*</sup>, Ranganathan K.<sup>1</sup> and Fernando E.Y.<sup>2</sup>

<sup>1</sup>Department of Botany, Faculty of science, University of Jaffna, Sri Lanka.

<sup>2</sup>Department of Biological sciences, Faculty of Applied sciences,  
Rajarata University of Sri Lanka.

Algae are identified as third generation carbon sources for bioethanol production. Hence two different types of marine algae, *Sargassum* spp. and *Halimeda* spp. were selected for bioethanol production. These marine algae were collected from North sea of Jaffna District, Sri Lanka. Samples were cleaned, dried, and crushed to powder and soaked in 150 mL of absolute ethanol for 5 successive days at room temperature ( $31\pm 3$  °C) separately. The supernatant was filtered through filter paper, and the samples were dried. Ethanol treated 10g of samples were mixed with phosphate buffer (pH 6.0), autoclaved and treated with  $\alpha$ -amylase at 60°C for 2 hours. After the incubation, fermentation ((L<sup>-1</sup>) 4g (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, 4g MgSO<sub>4</sub>, 8g KH<sub>2</sub>PO<sub>4</sub>, and 4g yeast extract) medium was added separately and autoclaved. Then the media were inoculated with 20 mL of Baker's Yeast (BY) and Palmyrah Toddy mixed Culture (PTC) inoculum separately and allowed to ferment at 100 rpm and room temperature ( $31\pm 3$  °C) for 72h in a rotary shaker. Bioethanol content was measured by ebulliometer. When BY was used as inoculum, *Sargassum* spp. and *Halimeda* spp. separately containing medium showed the highest mean bioethanol production (0.6% v/v, for both media) at 48 h of fermentation. The highest bioethanol ( $1.23\pm 0.033$  % v/v) production was obtained in a fermentation medium containing *Sargassum* spp. when PTC was used as the inoculum. When the different amount of PTC inoculum (5, 10, 15, 20, 25, 30, 35 and 40 mL) was used for both substrate separately, 20 mL of PTC inoculum showed highest bioethanol activity ( $1.26\pm 0.016$  % v/v) for *Sargassum* spp. and *Halimeda* spp. ( $0.91\pm 0.016$  % v/v) showed highest bioethanol activity in the presence of 30 mL inoculum at 48h of fermentation. Palmyrah Toddy mixed culture inoculum performed better than Baker's Yeast inoculum in the fermentation of selected seaweeds.

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\*Corresponding author: avengad19@yahoo.com