

## NAME OF THE THEME: Life Sciences & Agricultural Sciences

### Marine Brown Algae as Renewable feedstock for the Production of Biofuels

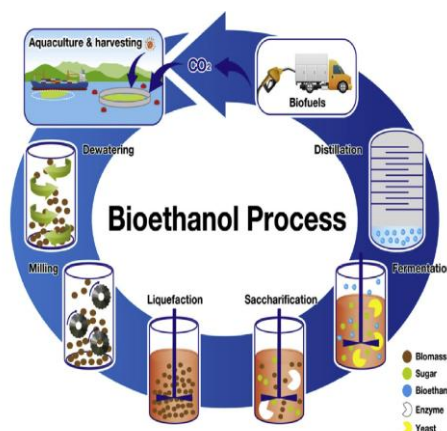
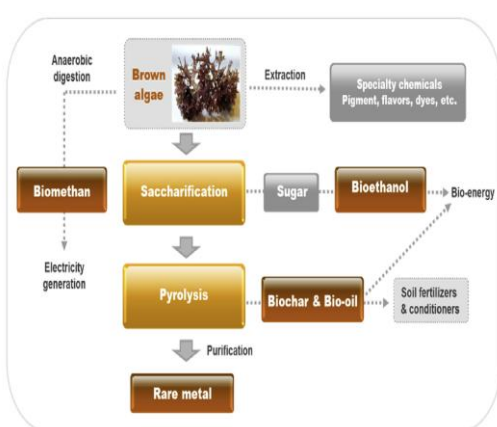
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#### Abstract:

Algae are renewable feedstock used in the third generation biofuels. There are different classes of macroalgae such as Brown, Red and Green based on pigments. Brown algae are widely used biomass for biofuel production than other types. The most abundant sugars in brown algae are alginate, mannitol and laminarin. Mannitol and glucose from laminarin (a form of glucan in brown algae) are normal sugars that are efficiently used for bioethanol fermentation. The polysaccharides present in the cell wall are converted to monosaccharide by various physical, chemical and enzymatic pretreatment methods. The acid/alkali pretreatment enhances the saccharification to increase the yield ethanol fermentation. Brown algae has zero lignin content hence a simple pretreatment like crushing and milling will be sufficient to release the sugar. In addition, enzymes are used for the hydrolysis like cellulose, cellobiase etc. Enzymatic pretreatment was used for the hydrolysis carbohydrates in the biomass using cellulase enzyme system supplemented with  $\beta$ -glucosidase. The fermentation process can be used for the production of bioethanol. The biomass (seaweed) undergoes anaerobic digestion and methane gas is formed. *Saccharomyces* is usually used for the production ethanol. There are recombinant strains like *Sphingomonas* strain are used to increase the yield. Therefore, brown alga is promising feedstock for the production of biofuels.



**Keywords:** Algae, Biofuel, Seaweed, Enzymes, Microorganism, Pre-treatment,

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