
Registration Seminar

Seminar Title	: BIOETHANOL PRODUCTION FROM SEAWEEDS BY FERMENTATION ASSISTED SACCHARIFICATION FOR THE DEVELOPMENT OF A CARBON-NEUTRAL STRATEGY
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Venue	: BM-Seminar Hall
Date and Time	: 19 May 2025 (10.00 AM)
Abstract	: The global fossil fuel reserves are depleting day by day. Therefore, there is a tremendous need to look for alternative fuels from renewable resources. Combating climate change has forced the world to seek alternative, low-carbon sources of energy and fuel. Bioethanol can be a valuable substitute to fossil fuels. The production of bioethanol from seaweeds can be cost-effective due to the vast supply of seaweeds from coastal regions. Seaweeds or macroalgae are a rich source of carbohydrates, lipids, minerals and also have very low content of lignin. Therefore, they can be a preferred feedstock for bioethanol production. Various methods of pretreatment can be used to breakdown the complex polysaccharides in the seaweed to fermentable sugars. A combination of thermal (autoclave) and biological (<i>L.casei</i>) pretreatment methodologies can be used for the process. Microbial pretreatment methods have been explored by using enzymes that can be utilized to aid saccharification. Culture conditions can be optimized and used for batch and fed-batch kinetic parameters study. Production can be scaled up in a reactor and technoeconomic analysis of the bioprocess strategy can be evaluated. In the preliminary studies, the seaweed was collected and hydrolysed using biochemical method by <i>Lactobacillus</i> species. Screening and optimization of parameters was done using Plackett-Burman and Response Surface Methodology to give best sugar yield. Optimized media was fermented with <i>S.cerevisiae</i> and bioethanol yield was estimated.

Keywords: Seaweed, *Lactobacillus casei*, bioethanol, optimization, fermentation