IL08 INVITED LECTURE · ENERGY SECTOR

Valorisation of Mass-Cultured Marine Macroalgae *Chaetomorpha sp.* for Biodiesel Production and Value-Added Products

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Abstract

Biodiesel production from third-generation biomass has seized worldwide attention because it effectively solves future energy constraints and thereby reduces the 'food versus fuel' debate. The present work aims to develop an exploratory approach to the mass cultivation of Chaetomorpha sp. a marine macroalgae collected from east-coast of Pondicherry, India for biodiesel production with higher cost-effectiveness. Macroalgae, a photosynthetic autotrophic organism, is rich in lipids, proteins and carbohydrates. This versatile organism has the ability to reduce greenhouse gases and climatic changes. The valorization of Chaetomorpha sp. biomass by sequential acid-base hydrolysis combined with two-phase solvent extraction under optimized conditions obtained a higher bio-oil yield of 83.7% (DW) and a lower yield of 29.6% (DW), which ascertains fatty acid concentration at varying meteorological conditions. The overall status of biodiesel production from macroalgae biomass shows inadequacy in coping with the global demand due to the lack of large-scale production. The current work emphasizes the vast potential of macroalgae and its conversion rate into biodiesel and value-added products. Strategic cultivation methods have been tried for the mass culture at laboratory level with low-cost mineral supplements.

Keywords: *biodiesel; bio-oil; Chaetomorpha sp.; macroalgae; transesterification*