

Mixotrophic Cultivation of *Scenedesmus quadricauda* for recovery of nutrients and bio-oil



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Abstract

Concern about global warming and energy security has led to increased biomass utilization as an alternative feedstock to fossil fuels. Microalgae biofuels are likely to have a much lower impact on the environment. Microalgae cultivation using sewage with industrial flue gases is a promising concept for integrated bio-oil production, CO₂ sequestration and nutrient recovery. Mixotrophic cultivation has given best results for microalgae biomass. Several mechanical and chemical processes are available for extraction of lipids components from microalgae biomass. In organic solvent extraction methods, a prior drying of biomass and recovery of the solvent is required which are energy-intensive. Thus, hydrothermal process overcomes the drawbacks of conventional methods where the biomass is converted into oily components by processing in a hot, pressurized water environment. In this process, in addition to the lipid fraction of microalgae, other value added products such as proteins, carbohydrates and nutrients can also be recovered. In the present study (*Scenedesmus quadricauda*) was cultivated mixotrophically using sewage wastewater and industrial flue gas in batch and continuous mode. The harvested algae biomass from *S. quadricauda* was used for the recovery of lipids and bio-oil. The lipids were extracted from the algal biomass using sonication as a cell disruption method followed by solvent (Hexane) extraction and the lipid yield obtained was 8.3 wt%. Hydrothermal process was also carried out for extraction of bio oil and the yield obtained was 18wt%. Nutrients such as NO₃⁻ (68%) and PO₄⁻ (15%) were also recovered along with bio-oil in hydrothermal process.

Biography:

Dr. V. Himabindu has completed her PhD in 1998 from JNTUH University Hyderabad, Telangana India. She is currently Head and Professor at Centre of Environment, JNTUH. She has published more than 80 papers in reputed International journals and has been serving as an editorial board member of several reputed journals. Till now she has supervised more than 18 PhD students. She has received research grants for more than 20 research proposals from different funding agencies like DBT, DST, MNRE, BARC, MHRD etc. Area of research are Environment and Energy, Waste recovery and reuse, Bioremediation, Biofuels, Carbon nano materials, etc.

Speaker Publications:

1. "Preparation of amorphous form of anti-ulcer drugs" journal of chemistry, Vol.1, No.1(2008),166-170.
2. "AN IMPURITY PROFILE STUDY OF LAMOTRIZINE"; Rasayan J. Chem journal, Vol.1, No.2 (2008), 301-305
3. "Commercial scaleable process for the preparation of polymorphic form-ii of Dutasteride"; Journal of Rasayan J. Chem, Vol.1, No.2 (2008), 322-325.
4. "Impurity profile study of dutasteride"; ingentaconnect, 27,2007. Pharmazie 62: 743-746 (2007).

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