



Isolation and Characterization of Microalgae for Biodiesel Production and Nutrient Remediation

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ABSTRACT: Biodiesel production from microalgae is being widely developed at different scales as a potential source of renewable energy. Although the cost of microalgal biomass production is currently much higher than from other energy crops. Thus, selection of an energy and cost-efficient production model could play a very important role in achieving competitive biodiesel production. Here, in this study, we focus on the selection of potential high lipid-accumulating microalgae strains and capable of nutrient remediation from dairy wastewater, a process that can be compared with the early domestication of current crop plants. Six microalgae were isolated from freshwater ponds and aeration tank of Shyam dairy effluent treatment plant. These isolates were identified based on partial 18S rRNA gene sequences. Growth and lipid accumulation potential of these microalgae were investigated in simulated dairy wastewater having chemical oxygen demand (COD) 3.0 ± 0.2 gO₂L⁻¹. One isolate, *Chlorella* sp. ASK22 and *Desmodesmus* sp. ASK01 accumulated moderate biomass 0.707 ± 0.056 gL⁻¹ and 0.667 ± 0.049 gL⁻¹ with high lipid productivity 16.8 ± 1.47 mgL⁻¹d⁻¹ and 14.5 ± 1.34 mgL⁻¹d⁻¹ respectively, while another isolate *Chlorella* sp. ASK25 showed highest biomass accumulation of 0.755 ± 0.05 gL⁻¹ with moderate lipid productivity 12.2 ± 0.96 mgL⁻¹d⁻¹. The fatty acid methyl esters (FAME) mainly composed of C-16:0, C-18:0, C-18:1 and C-18:2. This observation makes these microalgae immensely potential candidate for biodiesel production using the dairy wastewater effluent as feedstock. © 2016 iGlobal Research and Publishing Foundation. All rights reserved.

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