

Optimization of Media Nutrients for Enhancement the Production of Lipid Biosynthesis and Treatment of Pulp and Paper Industry Wastewater by *scenedesmus obliquus*

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Abstract—The world is concerned about depletion of fossil fuels, pollution control and other factors leading to the threat of human survival. A lot of methods and sources are being used to produce environment friendly biofuels. There is a huge potential of microalgae as a source of biofuel, and considerable research is still going on, but if microalgal biofuel production is to be made economically viable and sustainable, further optimization and analysis of media and culture conditions are needed. This study deals with optimizing important medium nutrient parameters for maximization of algal lipid and biomass production by *Scenedesmus obliquus* using paper and pulp industry wastewater treatment. Nutrients (nitrate, phosphate and iron) are investigated to improve the lipid accumulation, biomass production and carbohydrate consumption using a Box-Behnken design for the *Scenedesmus obliquus* cultivation. The ability of algae to treat wood-based pulp and paper industry wastewater is being investigated. Tests were performed in batch reactors seeded with *Scenedesmus obliquus* culture of algae. Under different medium parameter concentration, wastewater COD was analyzed. The effect of varying concentrations of nitrogen source, Iron and phosphate content effect on growth, lipid content, chlorophyll content and total sugar content are being studied. The COD of Wastewater is being studied to check treatment of wastewater by *Scenedesmus obliquus*. Highest lipid accumulation ~ 48% of dry cell weight recorded in the culture *Scenedesmus obliquus*. In the ongoing studies, I am trying to the treatment of paper and pulp industry wastewater by algae with enhancing lipid accumulation optimization of media nutrient using *Scenedesmus obliquus*.