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Assessment of municipal wastewaters at various stages of treatment process as potential growth media for *Chlorella Sorokiniana* under different modes of cultivation

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Abstract

Wastewater utilization for microalgal biomass production is potentially the most economical route for its fuel and feed applications. In this study, suitability of various wastewater streams within a domestic wastewater treatment plant was evaluated for microalgal cultivation. Pre-treatment methods were evaluated to minimize bacterial load. Biomass, cell physiology, nutrient removal efficiencies and biochemical constituents of *Chlorella sorokiniana* were investigated in influent (INF) and anaerobic tank centrate (AC) under mixotrophic (Mixo) and heterotrophic (Hetero) cultivation. Promising biomass ($77.14 \text{ mgL}^{-1}\text{d}^{-1}$), lipid ($24.91 \text{ mgL}^{-1}\text{d}^{-1}$), protein ($22.36 \text{ mgL}^{-1}\text{d}^{-1}$) and carbohydrate ($20.10 \text{ mgL}^{-1}\text{d}^{-1}$) productivities were observed in Mixo AC with efficient ammonium (94.29%) and phosphate (83.30%) removal. Supplementation of urea at a concentration of 1500 mgL^{-1} further enhanced biomass ($162.50 \text{ mgL}^{-1}\text{d}^{-1}$), lipid ($24.91 \text{ mgL}^{-1}\text{d}^{-1}$), protein ($22.36 \text{ mgL}^{-1}\text{d}^{-1}$) and carbohydrate ($20.10 \text{ mgL}^{-1}\text{d}^{-1}$) productivities in Mixo AC. Urea supplemented mixotrophic cultivation of microalgae in AC is developed as a biomass production strategy.

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