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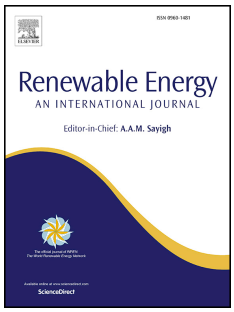

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Utilization of stagnant non-potable pond water for cultivating oleaginous microalga *Chlorella minutissima* for biodiesel production

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Abstract

Utilization of waste resources to cultivate microalgae for biofuel production has the potential to improve the economics along with sustainable reuse of discarded nitrogen and phosphorous sources. The present investigation aimed to cultivate an oleaginous microalga (*Chlorella minutissima)* in stagnant non-potable pond (SNP) water collected from different seasons (summer, winter and rainy) for biomass and lipid synthesis. The *C. minutissima* showed enhanced biomass productivity (245 mg/L/d) and lipid content (47 %) when grown in SNP water as compared to basal media, synthetic wastewater and recycled media respectively. The adaption in the SNP media by *C. minutissima* was attributed to an increase in cell size (~2 folds) with decrease in total protein content (~2 folds) and total carbohydrate content (~ 1 fold) respectively. The fatty acid profile indicated the presence of C16:0, C16:2, C18:0, C18:1 and C18:2 as major methyl esters in the derived biodiesel. Further, the measured biodiesel properties such as specific density (0.90 g/cm^3), kinematic viscosity (3.24 mm^2/s), flash point (143 ºC), iodine value (40.14 g I_2/100g) and acid value (3.24 mgKOH/g) abided by the ASTM D6751-02 and EN14214 standards. Therefore, such kind of SNP's have dual advantage; microalgal cultivation for biodiesel production and providing economical solution for bioremediation.

Keywords: microalga; *Chlorella minutissima*; pond water; lipid; biodiesel