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Effect of Nitrogen and Carbon Sources on Growth and Lipid Production from Mixotrophic Growth of Chlorella sp. KKU-S2

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Abstract : Mixotrophic cultivation of the isolated freshwater microalgae Chlorella sp. KKU-S2 in batch shake flask for biomass and lipid productions, different concentration of glucose as carbon substrate, different nitrogen source and concentrations were investigated. Using 1.0g/L of NaNO3 as nitrogen source, the maximum biomass yield of 10.04g/L with biomass productivity of 1.673g/L d was obtained using 40g/L glucose, while a biomass of 7.09, 8.55 and 9.45g/L with biomass productivity of 1.182, 1.425 and 1.575g/L d were found at 20, 30 and 50g/L glucose, respectively. The maximum lipid yield of 3.99g/L with lipid productivity of 0.665g/L d was obtained when 40g/L glucose was used. Lipid yield of 1.50, 3.34 and 3.66g/L with lipid productivity of 0.250, 0.557 and 0.610g/L d were found when using the initial concentration of glucose at 20, 30 and 50g/L, respectively. Process product yield (YP/S) of 0.078, 0.119, 0.158 and 0.094 were observed when glucose concentration was 20, 30, 40 and 50 g/L, respectively. The results obtained from the study shows that mixotrophic culture of Chlorella sp. KKU-S2 is a desirable cultivation process for microbial lipid and biomass production.

Keywords : mixotrophic cultivation, microalgal lipid, Chlorella sp. KKU-S2
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