

## Abstract

Microalgae as source of renewable energy are very potential due to high biomass productivity and lipid content. The nutritious culture for microalgae cultivation, however, should be concerned to be affordable and feasible. Here, the utilization of peat swamp culture for microalgal cultivation was studied in comparison to the nutritious pure water. The effects of photoperiod and nitrogen sources on biomass were conducted as well. Compared to the commercial microalgae, the microalgae isolated from peat swamp showed excellent performance with the faster growth time of 10 days as well as higher biomass and its productivity of  $1.72 \text{ g L}^{-1}$  and  $0.16 \text{ g L}^{-1} \text{ d}^{-1}$ , respectively. Even for the commercial microalgae, the cultivation process using the peat swamp water led to increase in biomass by 17.2% and its productivity by 10% compared to that using the nutritious pure water. The proposed kinetic model with a modification to the modified Gompertz model showed an excellent prediction with the experimental data as  $R^2$  of 0.985 was obtained. The model could well envisage the initial biomass and lag phase compared to the original model. Hence, the model is deemed beneficial for the research development for implementation in high scale of microalgal cultivation.