

Abstract

Biomass productivities of *Chlorella sorokiniana* in inclined outdoor tubular photobioreactors equipped with static mixers were evaluated. When the tube diameter of the photobioreactor was increased from 3.8 cm to 12.5 cm, the volumetric productivities decreased but the areal productivities increased. The effectiveness of the static mixers in improving the volumetric productivity was about 63% higher in large diameter tubular photobioreactors (12.5 cm diameter tubes) than in the small diameter tubular photobioreactors (3.8 cm diameter tubes). The static mixers were also more effective at higher standing biomass concentrations than at low standing biomass concentrations. Installation of static mixers in the tubular photobioreactor resulted in improved biomass yield from solar radiation. This could be partly due to better light distribution among the cells as the cells were moved efficiently between the upper and lower parts of the tubes, and partly due to lower dissolved oxygen concentrations (DO).

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