

ABSTRACT

Rubber Effluent (RE) was proven to be a suitable medium for algal growth in two previous studies. In this present study the effect of inorganic carbon supplementation on the productivity of *Chlorella vulgaris* was investigated in flasks and outdoor pond cultures. In flask cultures the specific growth rate obtained for CO₂ supplemented cultures was between 0.64 and 0.56 day⁻¹. Generally flasks supplemented with CO₂ or molasses or both together showed a better growth rate than the rubber effluent control.

Outdoor pond studies using the High Rate Algal Pond in five different batches had higher growth rate with supplementation of CO₂ and molasses (1.19 day⁻¹) compared to CO₂ alone (0.96 day⁻¹). Algal biomass concentrations up to 602mgL⁻¹ for CO₂ supplementation and 542mgL⁻¹ when supplemented with both CO₂ and molasses were obtained. The *Chlorella* biomass had good nutritional value, with up to 68.3% protein, 22.7% carbohydrates, 13% lipids and 0.7mg g⁻¹ dry weight of carotenoids. Treatment efficiency of ponds was high, giving up to 97.9% , 90% and 52.5% reductions for COD, NH₃-N and PO₄-P respectively for the CO₂ treated ponds. Ponds supplemented with molasses did not have good COD reduction due to the recalcitrant substances in molasses.