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 CO$_2$ supplemented cultures was between 0.64 and 0.56 day$^{-1}$. Generally flasks supplemented with CO$_2$ 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 CO$_2$ and molasses (1.19 day$^{-1}$) compared to CO$_2$ alone (0.96 day$^{-1}$). Algal biomass concentrations up to 602mgL$^{-1}$ for CO$_2$ supplementation and 542mgL$^{-1}$ when supplemented with both CO$_2$ 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, NH$_3$-N and PO$_4$-P respectively for the CO$_2$ treated ponds. Ponds supplemented with molasses did not have good COD reduction due to the recalcitrant substances in molasses.