TITLE: EVALUATION THE POTENTIAL OF MICROALGAL GROWTH IN WASTEWATER AND THEIR BIOMOLECULES PRODUCTION

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ABSTRACT

The high concentration of phosphate and nitrogen compounds in water bodies is one of the responsible for the eutrophication process, which being this the higher cause of phytoplanktonic microorganisms growth in the surface waters. The Brazilian wastewater treatment process drown high quantities of these molecules in the riverbeds, which made a great environment to the production of phytoplankton and, consequentely, the local eutrophication. This work evaluated the efficienty growth of different isolate microalgal in wastewater from wastewater treatment plant (WWTP) of Bauru, São Paulo, Brazil, for seven days, to verify the growth behavior of the microalgae and measure the protein and carbohydrate accumulation levels of these cultures. The microalgal culture were obtained from central region of the São Paulo state, they were cultivated in Erlenmeyer with wastewater, those that obteined the higher growth were later cultivated in vertical columns, with constant aeration and starter of $1,0x10^5$ cells mL^{-1}, per 7 days and photoperiod of 12 hours (light/dark). Microalgal growth was monitored by number of cells and cell fluorescence, the protein and carbohydrate composition were made by Bradford and concentrated sulfuric acid methodology. Microalgal growth were up to $2.3x10^7$ cells mL^{-1} and obtained dry weight biomass between 0.5430 g L^{-1} and 0.9353 g L^{-1}, with up to 36% of proteins and up to 30% of carbohydrates, get biomass with up to 65% of these biomolecules. The syntesis of these biomolecules, especially proteins, could show the capacity of bioremediation from these microalgae cultures, proteins can be made by aminoacids that need nitrogen in their structure, and it will be taken in wastewater. In addition, the populational grown of microalgal need a energetical syntesis, and it would be made by ATP syntesis, it only could be made by the uptaken of phospate in wastewater. Therefore, this work get a great potential in the use of wastewater to production of microalgal biomass. In addition, shown indirectly a promising potential for a possible wastewater microbiological treatment, due to getting of macrobiomolecules in the recovered cells from the process.

Keywords: eutrophication, bioremediation, protein, carbohydrate

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