

TITLE: CULTIVATION OF *Chlorella vulgaris* ON DAIRY INDUSTRY WASTEWATER

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ABSTRACT

Dairy industry wastewater treatment is of utmost importance in the state of Minas Gerais. Even after primary and secondary treatment, this wastewater may contain significant amount of inorganic nutrients like nitrate and phosphate, which allow eutrophication in water bodies. In the present study, dairy industry wastewater was employed for the cultivation of the green microalga *Chlorella vulgaris*. This process aimed the production of high quality biomass and, at the same time, the tertiary treatment of the effluent. This microorganism was cultivated in Erlenmeyer flasks containing concentrated wastewater (100%) or diluted with distilled water (75% and 50%). In comparison with control culture, employing Bold's basal medium, 75% wastewater allowed the best results of maximum cell concentration (X_m) and cell productivity (P_x). Therefore, *C. vulgaris* was cultivated in bench scale tubular photobioreactor employing 75% wastewater or Bold's basal medium (control). In tubular photobioreactor, the use of wastewater did not influence maximum cell concentration, in comparison with control culture ($X_m = 970.94$ and 969.02 mg.L⁻¹, respectively). However, since the use of wastewater allowed the achievement of X_m in a shorter time, the P_x was almost 40% higher than in control culture (137.11 and 98.66 mg.L⁻¹.d⁻¹, respectively). In addition, there was no difference in biochemical composition (total protein content, total lipid content and fatty acids profile). Further studies have to be carried out evaluating the efficiency of this microalga to remove inorganic nutrients, mainly nitrogen and phosphorus. The combination of microalgae cultivation to tertiary treatment and utilization of industrial effluent allows, in addition to the environmental benefits, the possibility of producing biomass at low cost.

Keywords: microalga, biomass, wastewater treatment, *Chlorella vulgaris*

Development Agency: Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq Proc. nº 402658/2013-2) e Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG).