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Evaluation of *Chlorella sorokiniana* mixotrophic growth using xylose as a carbon source

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Microalgae are photosynthetic microorganisms that may grow mixo or heterotrophically with higher biomass yield be used for the production of biofuels and high value compounds such as pigments and polyunsaturated fatty acids without direct competition for land, water and crop production. Cheap organic compounds, such as glycerol, acetate and xylose, a byproduct of the sugar cane bagasse pretreatments, can be used as carbon source. In this work, the ability of *Chlorella sorokiniana* to grow mixotrophically using xylose as organic carbon source was evaluated. Cells were grown in orbital shaker for 13 days under 50 $\mu\text{mol photons m}^{-2}\text{s}^{-1}$ irradiance at 30°C in Bold's Basal Medium containing 25 mg/mL chloramphenicol, 100 mg/mL penicillin and 20 mg/mL sodium acetate to control contamination by bacteria and fungi, respectively. Cell growth was followed by cell counting and xylose was added at the medium culture at the beginning (single batch) at the sixth day of growth (fed batch). Xylose consumption was determined by measuring the residual reducing sugar by the DNS method. As control, cells were grown photoautotrophically under the same conditions. Cells under mixotrophic growth showed two exponential phases. The first showed the same specific rate of growth of 0.9 d^{-1} observed for the photoautotrophic growth. However, the second phase showed, respectively specific rate of growth of 0.6 d^{-1} and 0.4 d^{-1} for single and fed batches, and their final biomass yields were 3.2 and 4.0 fold higher than that obtained for the photoautotrophic growth. The influence of acetate on the growth is being investigated.

Biography

Marco Aurelio Almenara Rodrigues has Bachelor's Degree in Industrial Chemistry from Catholic Pontifical University of Rio de Janeiro, Master's and Doctorate degrees in Biochemistry (Photosynthesis) from Federal University of Rio de Janeiro and King's College London (Sandwich Doctorate). He has experience in Biochemistry, Photosynthesis and Photo-inhibition and Plant Biotechnology, acting on the following subjects: Chemical education, biochemistry, green algae, photosynthesis of chlorella, biomass processing, biorefinery, ethanol of third generation. Recently, he was engaged in a Post-doctoral training in algal and lignocellulosic biomass processing at the National Laboratory of Energy and Geology, Lisbon, Portugal.

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