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Cyanobacteria isolated from Amazonian rivers growing in vinasse for biodiesel production

Wallace Rafael de Souza^{1,2}, Diego Bonaldo Genuário², Itamar Soares Melo², Márcia Maria Parma² and Regina Teresa Rosim Monteiro¹ ¹University of São Paulo, Brazil ²Embrapa Environment, Brazil

Cyanobacteria is a very versatile group of microorganisms thriving in the most extreme conditions. Its potential as a source of energy is attributed to its fast growth and high photosynthetic rates. However, information regarding its diversity in some environments is still scarce. Notwithstanding, the selection of suitable strains and use of residues from the industry can contribute to costs reduction in a large-scale system. In this context, the use of sugarcane vinasse, the main residue of ethanol production, to obtain biomass from *Cyanobacteria* represents a great deal. Twelve nonaxenic *Cyanobacterial* strains isolated from Amazon and Solimões were tested in three culture media added with vinasse (1%, 2.5%, 5% and 10% v/v) and ultrapure water (2.5%, 5% and 10% v/v) in 24-well plates at room temperature. These isolates were morphologically and phylogenetically characterized using the 16S rRNA gene sequence. Eleven strains grew in at least one concentration of media+vinasse and two in water+vinasse (pH varing from 4.5 to 6.7). Visually, increasing the vinasse concentration caused biomass reduction and proliferation of residual yeast (optical microscopy). In most isolates, the fatty acids profile changed accordingly to their types and amounts with regard to those used for biodiesel production. Considering the unicellular *Chroococcidiopsis* sp (# 20) in BG-110 medium with 5% vinasse, the fatty acid C16:1 decreased from 17.46% to 11.81% and C18:1 increased from none to 24.79% when compared to BG-110 medium. These results suggest that *cyanobacteria* strains from Amazonian region tolerate vinasse until 5% without any pH adjust with undesired yeast proliferation.

Biography

Wallace Rafael de Souza graduated in Environmental Engineering from Faculdade de Jaguariúna/Sligo Institute of Technology (2015) and has experience in environmental microbiology (bioprosprecting and biotechnology of microorganisms and taxonomy of actinomycetes). Currently, he is doing his Master's degree in Science at University of São Paulo (CENA-USP) with potential of *Cyanobacteria* from rivers of the Amazon region for biodiesel production. He has published 6 papers in peer-reviewed journals.

walla_souza@hotmail.com

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