The Influence of Carbon and Nitrogen Deprivation for Polyhydroxyalkanoates Production from Amazonic Microalgae

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INTRODUCTION: The microalgae group synthesize several secondary metabolites under starvation stress. Many species regulate their metabolisms synthesizing polyhydroxyalkanoates or PHAs which are carbon and energy granules or storage cytoplasmic biopolymers. The microalgae change their intracelular morphology producing PHAs under nitrogen deprivation or by excess of carbon sources. PHAs granules can be detected using fluorescent dyes and quantified by High Performance Liquid Chromatography. However, even with the easy cultivation of microalgae, the number of amazonic species well-known is quite low. **OBJECTIVES:** The present study aims to evaluate the polyhydroxyalkanoates production in a pioneer microalgae from Amazon Rainforest. **MATERIAL AND METHODS:** The assays were performed by inducing the microalgae with sodium bicarbonate (5 mM) and sodium nitrate (17,6 mM) at four different BG-11 media. During 9 days of cultivation, aliquots of each medium were stained with Nile Red for visualization of the polyhydroxyalkanoates on a fluorescence microscopy (emission at 543 nm). Moreover, in the same period, the PHA fluorescence was quantified by spectrofluorimetry (excitation and emission wavelengths at 470 nm and 543 nm, respectively). **RESULTS AND DISCUSSION:** On the fifth day of cultivation, was observed the presence of PHA in both BG-11 media with and without sodium bicarbonate. The supplemented medium showed good granules concentration of PHA and fluorescence intensity than BG-11 medium itself. Also, on nitrogen deprivation cultivation, was found a good production of PHA and fluorescence intensity. The medium supplemented with sodium bicarbonate under nitrogen deprivation showed the highest production of PHA. **CONCLUSION:** The supplemented medium with sodium bicarbonate under nitrogen deprivation was effective in inducing the production of PHA on the microalgae. Further experiments, which are the measurement of the growth curves to correlate with PHA production, extract and quantify PHA by High Performance Liquid Chromatography, will be performed.

Keywords: Microalgae, Polyhydroxyalkanoates, Starvation Stress, Fluorescence, Amazon.

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