THE EFFECT OF CONCENTRATION OF CRUDE GLYCEROL FROM BIODIESEL INDUSTRY ON *Pseudomonas Aeruginosa* LBI RHAMNOLIPID PRODUCTION

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Brazil has one of the most important biodiesel industries in the world. Along with the growth of this industry, an important by-product, crude glycerol, emerges as the principal residue resulting from this biofuel production. For each 10kg of biodiesel 1kg of crude glycerol is produced. Thus, an efficient and economic utilization of this waste product is a great challenge. This feedstock can be used as carbon source for the synthesis of different bio-products, which can have high manufacture costs. Rhamnolipids are molecules produced by *Pseudomonas aeruginosa* and have a potent surface activity, aggregate formations and emulsifying activity. Due to these properties, rhamnolipids have various industrial applications and in bioremediation. Nonetheless, the production of these biosurfactants is still expensive, but the utilization of glycerol, as an hydrophilic carbon source, promises an economic and feasible opportunity for improving rhamnolipid production. The aim of this study was to evaluate the rhamnolipid production by *Pseudomonas aeruginosa* LBI using different concentrations of crude glycerol as a by-product from biodiesel industry. Fermentations in 1L Erlenmeyer flasks were conducted, with 300mL of Ca-free mineral salt solution and three different concentrations of crude glycerol (30, 50 and 70g/L). These cultures were incubated at 37 °C, 200 rpm, during 120h. Samples were taken routinely for offline analysis of rhamnolipid production, carbon source consumption and biomass production. All the experiments were made by triplicate and statistical analysis were performed. The average maximum rhamnolipid concentration achieved was 0,428g/L after 72h of fermentation, using 30g/L of crude glycerol, and after 120h the carbon source was completely depleted, and 6,67±0.03g of biomass were obtained; meanwhile, there was no production reported using 50g/L and 70g/L, and the substrate consumption and the biomass production were 20 and 31% and 3,3g/L and 2,3g/L, respectively. This study explicitly shows that *Pseudomonas aeruginosa* LBI has the ability to grow on glycerol, and to use it as a carbon source for rhamnolipid production. In this case, the best concentration for biosurfactant production was 30g/L. This sugests that substrate concentration may be a limiting factor on the rhamnolipid synthesis. In order to achieve a profitable bioproduct it is necessary to increase the production yield by optimizing some culture parameters.

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