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CASSAVA WASTEWATER AS CARBON SOURCE FOR THE POLYHYDROXYBUTYRATE PRODUCTION BY *Azotobacter vinelandii* CCT 2841.

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The polyhydroxybutyrate (PHB) is also known as bioplastic, have thermoplastic properties and performance characteristics similar to conventional plastics. However, bioplastics are easily degraded by the microorganisms action in the environment with the advantage on the conventional plastics of petrochemical origin, take decades to decompose in nature and also produce toxins during the degradation process. Therefore, there is a special interest in the plastics production from materials that can be easily eliminated from our environment. The PHB, intracellular polymer belonging to the polyesters family, can be synthesized by many bacteria in bioreactors from sugars under stress. This polymer can represent up to 80% of total dry mass of the cell and are 100% biodegradable and biocompatible with the animal tissue. Some possible PHB applications include: biodegradable carriers that have the function of drug release for a given time within the individual's body; surgical needles; sutures; bone tissue replacement; etc. The biodegradable plastics advantage is not requiring surgical removal. The *Azotobacter vinelandii* advantage is the PHB production during its growth through the use of a wide variety of carbon source like those found in molasses cane sugar, beet sugar and corn syrup, for example. Another advantage is the easy attainment of this bacterium, since *A. vinelandii* is found in soils and in freshwater. In this work was studied the PHB production by *A. vinelandii* CCT 2841 using cassava wastewater, produced by cassava processing, as a main carbon source. The optimal values for the PHB production were determined by MSR (STATISTICA software). For the PHB (Y1 = polyhydroxybutyrate) optimization production was carried out the experimental design to determine the best production area. Thus, was performed a statistical fractional factorial design 2^{3-1} and the independent variables were: X1 = incubation temperature (ºC); X2 = time (h); X3 = agitation (rpm). Each experiment consisted of: autoclave materials sterilization; pre-inoculation preparation (*Azotobacter vinelandii* CCT 2841 from the stock culture was transferred for tubes containing Plate Count Agar inclined, which were incubated in an oven at 30 ºC for 24 hours); pre-fermentation (with the pre-inoculum previously obtained, was realized the bacterial cells suspension by adding 5 mL of nutrient broth and trace metals solution mixture contained in the flask (total of 44.95 mL of nutrient broth and 0.05 mL of trace metals solution, and then moved the suspension to the same flask. The vials were incubated in an orbital shaker rotating at 30 °C for 24 h and 225 rpm) and fermentation (for each experiment was used 50 mL of cassava wastewater (pH = 7.0) added of 0.40 g yeast extract, 50 µL of trace metals solution and inoculum standardized to 0.9 absorbance at 620 nm by spectrophotometer) in rotary shaker. Then, the cells were centrifuged and performed the extraction and precipitation of intracellular polymer (PHB). It was found that the highest biomass (2.0 to 2.5 g L^{-1}) was in 35 ºC, 48h and the agitation was not an important factor for cell growth. One can also observe that the PHB yield was maximum (200-300 mg g $cell^{-1}$ h^{-1}) in the incubation temperature of 25 °C, the shortest incubation time (8h) and agitation at 225 rpm.

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