

TITLE: YIELD OF BACTERIAL EXOPOLISSACARÍDE FROM THE REUSE OF ETHANOL.

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ABSTRACT:

Exopolysaccharides (EPS) are biopolymers produced by microorganisms. The natural biosynthesis of EPS by bacteria is related to the survival of these microorganisms when exposed to several adverse conditions. Industrially and on bench scale the EPS are produced from fermentative processes influenced by carbon source, pH and temperature. There are many studies related to the fact that EPS presents rheological properties of interest, revealing its high potential from biotechnological applications to industrial applications. But the problem is still the cost of production and recovery of EPS. The aim of this study was to evaluate the yield of bacterial EPS from the untreated reuse of ethanol P.A. during the recovery stage. For the production of EPS, the isolate *Bacillus* sp. (S3.6) was inoculated into 100 ml of EPS inducing medium and maintained under constant stirring at 120 rpm for 72 hours. Then the cells were removed from the fermented broth by centrifugation (3500 rpm - 40'). The recovered bacterial biomass was determined. For the recovery step, the supernatant was mixed with ice cold P.A. ethanol in the ratio 1/3 and stirred vigorously for EPS precipitation and the material was kept in a freezer at -20 ° C for 24 hours. The solution was centrifuged, the supernatant discarded and the precipitated EPS kept in an oven at 50 ° C until reaching constant dry mass to quantify its yield. The ethanol used for recovery was reused in two new EPS production and recovery processes following the described methodology. The experiment was assembled in triplicate and the means were compared by the Tukey test ($p < 0.05$) using the Sisvar software. There was no significant variation in the bacterial biomass produced, confirming that the fermentation process was stable in the three experiments: 0.26 g, 0.25 g and 0.25 g, for fermentations 1, 2 and 3, respectively. The EPS yield from the first fermentation and using pure ethanol presented 2.0 g, differing statically from the other recoveries. The ethanol used in the second recovery had a mass of 1.04 g and in the third recovery 1,3 g did not differ significantly between them. These data show that EPS recovery yield is reduced by about 50% after using ethanol used in previous recoveries. Water mixed with ethanol during the recovery step significantly reduces the EPS precipitation effect for further recoveries.

Keywords: biopolímero, etanol, rendimento.

Development Agency: Universidade do Estado da Bahia, CNPq