**TITLE:** OPTIMIZATION OF EXOPOLYSACCHARIDE PRODUCTION BY BACTERIA ISOLATED FROM CACTACEAE CAATINGA

**AUTHORS:** LANDIM, L. F.; SOUZA, B. C.; JAMBEIRO, I. C. A.; SILVA, E. P.; BARROS, Y. C.; SILVA, L. F. C.; BISPO, A. S. R.; SANTOS, A. F. J.

**INSTITUTIONS:** UNIVERSIDADE DO ESTADO DA BAHIA, JUAZEIRO, BA (AVENIDA EDGARD CHASTINET, S/N – SÃO GERALDO, 48900-000, JUAZEIRO – BA, BRAZIL)

UNIVERSIDADE FEDERAL DO RECÔNCAVO DA BAHIA, CRUZ DAS ALMAS - BA, 44380-000

## ABSTRACT:

Products generated from bacterial biopolymers are increasingly attractive to the market and play an important role in various sectors of the world economy. Also impacting on reducing the use and accumulation of oil products such as plastics in the environment. The composition of the synthesized biopolymer will depend mainly on the microorganism species, type of nutrients provided and fermentation conditions. The aim of this study was to select native Caatinga rhizobacteria with the potential to synthesize exopolysaccharides (EPS) and to determine the optimal condition for the production. A volume of 5 µl of bacterial suspension was inoculated onto sterile filter paper disks in the culture medium containing 10% sucrose as sole carbon source. The EPS production was observed from the formation of a mucoid layer and confirmed in the presence of absolute ethanol. Isolated EPS producers were submitted to different cultivation conditions, using the Rotational Compound Central Design (RCCD) with 3 variables: pH, temperature and sucrose, totaling 18 trials. The dependent variable was expressed in centimeters and consisted of the measurement of the diameter of the mucoid layer. Statistic 7.0 software and Anova test were used at 0.5% probability. It was possible to define the best condition for the production of the 15 selected isolates with potential to synthesize EPS. From the selected bacteria and the evaluated conditions the isolate M7.1 was highlighted in the assay 16 (pH 7.0 - temperature 38.5 - sucrose 5.5%), presenting the highest potential of the isolates that were significant in the production of EPS. The diameter of the mucoid layer was 3.65 centimeters. The derivation of the data was performed generating the maximum points in the response surface and contour curve, thus allowing to estimate the optimum conditions for EPS production. The optimum points were pH 7.4 and 8.75% sucrose. The column graph showed that the percentage of carbon and pH had a significant correlation influencing the EPS production under the conditions tested. However, the temperature did not significantly influence the production for this isolate. Bacteria native to the caatinga have potential for EPS production and may be better studied for industrial application.

Keywords: EPS; bacteria; Caatinga

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