

The 2³ Factorial Design in L-glutaminase production from *Poincianella pyramidalis* rhizosphere of the Caatinga Biome

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Introduction: A sample of an actinobacteria, hereafter 8M, from *Poincianella pyramidalis* rhizosphere of the Caatinga Biome, was successfully assayed on the production of L-glutaminase enzyme. L-glutaminase catalyzes the conversion of L-glutamine into glutamate acid and ammonia. This enzyme has been especially applied on the pharmaceutical and food industries. Furthermore, chemical reaction of L-glutaminase plays an important role in the prokaryotic and eukaryotic metabolism. **Objectives:** to optimize the production of the L-glutaminase complex, it was performed a 2³ factorial design, with duplicate, to evaluate the experimental error. **Material and Methods:** The experiments presented as variables the pH values (7.0 and 9.0), temperatures (33°C and 44°C) and L-asparagine concentrations (0.5% and 1.5%). Throughout this stage, colonies of *Actinobacteria* sp. grew on the International *Streptomyces* Project medium 2 (ISP-2) at 37°C for 48 h and then an aliquot of 10% (w/v) was inoculated onto M9 medium, minimal growth medium used for L-glutaminase culture, in the above mentioned variables. Afterwards, the enzyme activity was measured via Nessler reaction. **Results and Discussion:** The best result in the enzymatic measurement was observed in the sample with pH 7.0, temperature 44°C and 1.5% concentration. Statistical analysis of the variables and analysis of variance (ANOVA) were evaluated through the Statistica program, version 7.0 (StatSoft Co., USA). The analysis of variance led to a coefficient of determination of 94.87%. The study of the main effects and their interactions showed that all assayed factors were significant and that there is a relevant interaction between temperature and concentration of L-glutamine. **Conclusions:** In this study, it was proved the efficiency of the complete factorial design (2³) to identify important factors, which influence the optimization process of the L-glutaminase production.

Key words: Actinobacteria, Factorial Design, L-glutaminase.
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