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# Optimization of Actinomycin D Production Using Response Surface Methodology as Statistical Tool

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In a general way, the isolated microbial strains from nature produce discrete amounts of a particular secondary metabolite. The identification and characterization of bioactive compounds from crude extracts, makes it possible to improve the production of a metabolite of interest. The *Streptomyces sp* strain Caat 7-38, isolated from Caatinga biome rhizosphere which produces Actinomycin D, a potent antibiotic marketed under an antitumor agent. In order to improve the production of Actinomycin D, an experimental design 3^k (3^3), generating response surfaces as a function of the independent variables: carbon source (%), nitrogen source (%) and temperature (°C) of culture conditions in ISP-2 medium, and as a dependent variable (response), the production of actinomycin D, was performed.

The crude extracts generated in each one of the experiments were analyzed and processed by LC-MS with constructing an analytical curve with standard solution of 10, 50, 100, 200(µg/mL), and thus, the determination of the concentration of the compound in the different crude extracts. Through experimental results it was possible to obtain an empirical mathematical model that was able predicting the studied system, and thus, to determine the optimal values for each independent variable under the study ranges. With the validation of mathematical model and optimal values, we increased the production of Actinomycin D in 5-fold in regarding to control (standard growth media).

Figure 1: CID mass spectra of ion *m/z* 1255 (Actinomicin D) with colision energy at 50 eV.
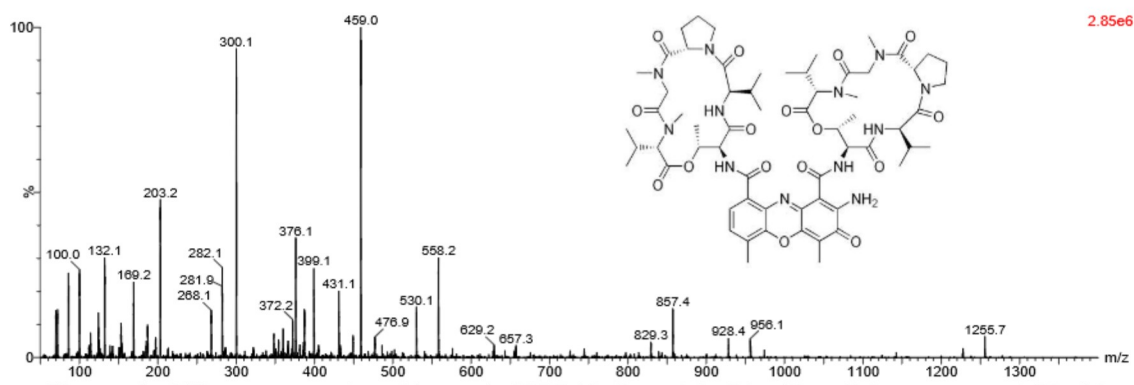
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