COMPARISON IN THE TRICHODERMA LONGIBRACHIATUM XYLOGLUCANASE PRODUCTION USING TAMARIND (TAMARINDUS INDICA) AND JATOBÁ (HYMENAEA COURBARIL) SEEDS: FACTORIAL DESIGN AND IMMOBILIZATION ON IONIC SUPPORTS

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Body

The xyloglucan (XG) is the predominant hemicellulosis at the primary cell wall of superior plants. It has a fundamental role in the control of the stretching and expansion of the plant cell wall. There are five types of enzymes known to be capable of cleaving the linear chain of xyloglucan, the most famous of them being the xyloglucanase (XEG). The immobilization can be used to solve problems related to stability, besides the economic benefits brought by the possibility of repeated use and recovery, decreasing the costs of production. Therefore, this study aims the optimization of the production of a xyloglucanase from *Trichoderma longibrachiatum*, with the aid of factorial design, using tamarind (*Tamarindus indica*) and jatobá (*Hymenaea courbaril*) seeds as carbon source; and the immobilization of the enzyme on ionic supports, such as MANAE (monoamino-*N*-aminoethyl), DEAE (diethylaminoethyl)-cellulose, CM (carboxymethyl)-cellulose and PEI (polyethyleneimine). High concentrations of carbon source in the culture medium, especially tamarind seeds, were the most favorable conditions for the greater activity of the xyloglucanase from *T. longibrachiatum*. The scaling up from Erlenmeyer flasks to the bioreactor was an essential strategy to increase the content of secreted enzyme. Regarding the biochemical characterization of the crude extract, the optimal temperature was 50-55 °C and the optimal pH 5.0. Regarding the stabilities to pH and to temperature, the enzyme was not stable for prolonged periods, which was crucial for the performing of immobilization on ionic resins (CM-cellulose, DEAE-cellulose, MANAE, and PEI), being the first time described in literature the immobilization of a xyloglucanase on these supports.

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Palavras-chave : xyloglucanase; Trichoderma longibrachiatum; Hymenaea courbaril; Tamarindus indica; enzyme immobilization