ASSESSMENT OF POLYURETHANE FOAM, PERLITE AND "TEZONTLE" AS INERT SUPPORTS FOR XYLANASE PRODUCTION BY SOLID-STATE FERMENTATION WITH *Aspergillus oryzae.*

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Introduction. The fermentation technology has been involved in the production of various food products for thousands of years. Use of microorganisms has been introduced for many biotechnological applications at industrial level. Fermentation processes can be divided in solid-state (SSF) and submerged (SmF) fermentations. The major difference between these bioprocesses is the amount of free water in the system[1]. SSF can be defined as the cultivation of microorganisms on moist solid supports, either on inert carriers or on insoluble substrates that can, in addition, be used as carbon and energy sources[2]. The success of a process depends on the selection of a suitable carrier; use of inert supports impregnated with defined media during the SSF can accurately used to evaluate the formulation of the culture medium and metabolic products, without interference from natural components of the substrates used traditionally in the process[3]. Therefore, in this project we evaluated the ability of *Aspergillus oryzae* in xylanolytic enzyme production in SSF using the same culture medium and different inert supports (polyurethane foam (PUF), perlite and "tezontle").

Methods. *A. oryzae* was used for all experiments. Pontecorvo medium. SSF were carried out on glass columns "Raimbault type". PUF, perlite and "tezontle" impregnated with the inoculated ($2x10^7$ spores/gdm) Pontecorvo medium containing 0.2% birchwood xylan as carbon source were used for xylanase production studies. Samples were taken in triplicate every 12 hours for 5 days to determine xylanase activity by the release of reducing sugars, which are determined by the DNS[4], sugar consumption was estimated as total sugars by the phenol-sulphuric method samples[5], extracellular protein concentration was estimated by the method of Bradford[6].

Results. FES kinetics was performed on *A. oryzae* determining the pH, concentration of total sugars and protein in the three inert supports. In each of the inert supports found in the pH range of 6.5 and 7.5, whereas the higher concentration of extracellular protein PUF was obtained, with a maximum concentration of 664.5 μg/gdm to 60 h and noting that only in the case of "tezontle" the amount of the residual carbon source is greater than 50%. Figure 1 presents kinetic data of xylanes production by SSF with different inert supports. The highest activity (17.4 U/gdm) was obtained with PUF as support after 48 h of incubation. Use of perlite allowed obtaining xylanase activity of 6.31 U/gdm after 60 h of culture.

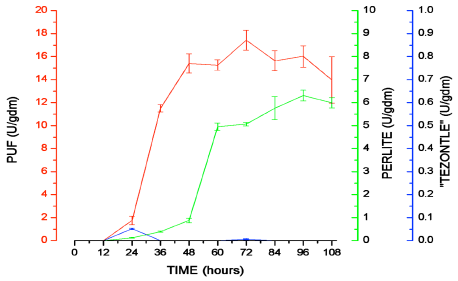

FIGURE 1: Comparison of xylanase activity during FES growth in inert supports

Conclusions. Kinetics of production xylanase activity strongly depended on the type of inert support used for the solid-state fermentation. Use of PUF allowed obtaining the highest productivity on xylanase.

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