COMPARATIVE STUDY BETWEEN SOLID STATE FERMENTATION AND SUBMERGED FERMENTATION FOR THE PRODUCTION OF A PROTEASE FROM *ASPERGILLUS NIGER* WITH COAGULANT ACTIVITY.

Teresa Andrade, Adán Chávez, Fernando García[2], Sergio Sánchez[1]; 1.UNAM, Instituto de Investigaciones Biomédicas UNAM, México, D.F., A.P. 70228, C.P. 04510; 2. Centro de Física Aplicada y Tecnología Avanzada, UNAM Boulevard Juriquilla No. 3001, Juriquilla, Querétaro, México. C.P.76230. cuasares_ta@yahoo.com.mx

Key words: Aspergillus niger, solid state fermentation, protease.

Introduction. *Aspergillus niger* is a filamentous fungi capable of secreting a great variety of extracellular enzymes (1). This capability has been exploited on an industrial scale to produce economically important enzymes such as glucoamylase (2). A very important group of industrial enzymes produced by *Aspergillus* species are the proteases, occupying about 65% of the global market for enzymes used in the food and pharmaceutical industry (3). Due to the great demand for such enzymes, in recent years the solid state fermentation (SSF) has been used like alternative to produce these, because there is evidence that in SSF the fungal enzyme secretion is increased, compared with submerged fermentation (SmF)(4,5).

The aim of this project is focused on two *Aspergillus niger* strains, strain 18 which secretes an active protease in SmF with coagulant activity and strain 54, derived by UV treatment from strain 18.

Methods. Based on this background, we decided to test the SSF as an alternative to increase the active protease production, optimizing the substrate type, protease concentration and method of extraction and then compared the ability of active protease production in each fermentation (SSF and SmF). Total concentration of protease and active protease were determined by densitometry and coagulant test plate, respectively.

Results. The results show that strain 54 produced more active protease (18.7%) when grown in SSF compared with SmF. Furthermore, this strain produced more active protease (22.41%) than strain 18 when both were cultivated in SSF. Additionally, in a test to evaluate the proteolytic capability of the supernatants from SmF and SSF, it was found that the proteolytic capability is lower in supernatants from SSF, compared with those from SmF**.**

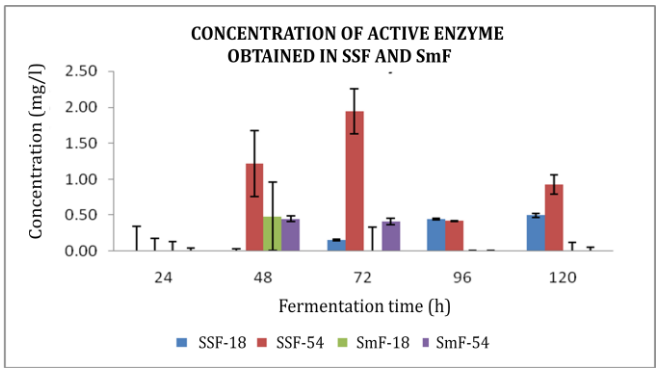

Fig.1 Determination of the concentration of active enzyme by turbidity test plate milk. Concentration of active protease SSF with strain 18 (SSF-18) and strain 54 (SSF-54) and in SmF with strain 18 (Fsm-18) and strain 54 (SmF-54).

Conclusions. Based on these results, we are able to propose that SSF may be a viable alternative to produce active protease using the strain 54 of *A. niger.*

Acknowledgements. Thanks to the support given by the company ALTECSA, S.A. DE C.V.

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