University of Baghdad

College Name	Education for Women
Department	Home Economics
Full Name as written in Passport	Dhafer Ali Mohammed Hussein
e-mail	dh_alshaibany@yahoo.com
Career	● Assistant Lecturer ○ Lecturer ○ Assistant Professor ○ Professor
	● Master ○ PhD
Thesis Title	***Production And Preservation Of Industrial Enzymes From Fungus Aspergillus niger var carbonarius During Soaking Of Animal Skins***
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Abstract

Abstract

The present study involved the investigation of fungi associated with livestock skins (goat and sheep skins and cow hides) during soaking in salt solutions of concentrations of 0,2,3,5,7 and 10% and in temperatures of 20,30 and 40 °C. Three isolates from the fungus ***Aspergillus niger*** were examined for their ability to produce proteases and amylases according to the optimum conditions using Solid-state fermentation technique. Both types of enzymes (proteases and amylases) were purified by several steps including precipitation with ammonium sulfate with saturation percentage of 50-75% for proteases and 25-50% for amylases followed by ion-exchange chromatography using DEAE-Cellulose column and followed by gel filtration chromatography using Sepharose 4-B column. The crude extracts of proteases and amylases were immobilized with wood shreds and egg shells then stored at 4 °C for three months. The results obtained were as follow:

1- Five genera of fungi namely: ***Alternaria, Aspergillus, Drechslera, Mucor, Penicillium,*** including eight species were diagnosed.

2- The genus ***Aspergillus*** showed predominance on other genera of fungi in all

salt concentrations used in soaking skins with an average growth percentage for all salt concentrations of 88.095 % in cow skin, 74.535 % in goat skin and 47.48% in sheep skin, while the genera ***Alternaria*** , ***Mucor, Penicillium*** showed irregular and different growth patterns in salt concentrations for different skins under study, whereas ***Drechslera*** did not show notable growth in all skins but sheep skin.

3- The fungal genera ***Aspergillus*** and ***Penicillium*** demonstrated notable growths in the three temperatures used in the study (20, 30 and 40 °C) with an average growth percentage of 100, 76.86 and 16.66 % for ***Aspergillus*** in cow, sheep and goat skins, respectively, followed by ***Penicillium*** with 50, 11.57 in goat and sheep skins, respectively.

4- The isolate ***Aspergillus niger*** var ***carbonarius*** was selected for its high ability of proteases production on purpule agar medium, pH-7. This isolate also demonstrated an ability of amylases production on the same medium.

5- The purification by ammonium sulfate resulted an enzyme yield of 40.42% and purification fold of 5.9425 for proteases and 76.17% and 2.25, respectively, for amylases. The ion-exchange chromatography performed an enzyme yield of 30.14% and purification fold 8.86 for proteases and 63.97% and 6.45, respectively, for amylases. However, gel filtration chromatography performed an enzyme yield of 17.73% and purification fold of 10.43 for proteases and 48.57% and 8.75, respectively, for amylases.

6- The storage with wood shreds of crude proteases extract produced by the same local isolate led to the retention of 32% of its activity after three months in 4 °C while, it retained 25% upon storage with egg shells. However, amylases retained 13.33% of its activity when stored with wood shreds and 19.23% when stored with egg shells for the same time and temperature.