شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

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التوثيق الالكتروني والميكروفيلم

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لم ترد بالأصل

SUPERVISION SHEET

UTILIZATION OF SOME AGRICULTURAL WASTES IN PRODUCTION OF CELLULASE

By

Hala Mohamed Zaki Ali

B. SC. Agric. (Food Sci. & Tech.), Cairo University, 1986
M. SC. Agric. (Food Sci. & Tech.), Ain Shams University, 1993

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2002

APPROVAL SHEET

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Committee in charge: 10 / 1 / 2002

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Branch : Food Technology **Approval:** 10/1/ 2002 .

ABSTRACT

The present study was carried out to evaluate some of the Egyptian agricultural wastes such as beet pulp and olive cake in the production of microbial cellulase and hemicellulase.

The suitable environmental conditions and nutrition requirements which gave the highest cellualolytic enzymes production for (*Trichoderma reesei* and *Sclerotium cepivorum*) were studied.

The obtained results could be summarized in the following :

-The alkali treatment (4% NaOH) of beet pulp showed higher enzymes (cellulases and hemicellulases production than that obtained with olive cake. While the other used pretreatment came in descending order of acid hydrolyses, boiling water and untreated beet pulp and olive cake wastes with respect to celluloytic enzyme activity and specific activity.

-For both wastes and with all pretreatments, the activity and specific activity values of hemicellulase were higher than those of carboxy methyl cellulose, whereas, filter paperase and cellobiase enzymes had the lowest values in this respect.

-The maximum enzyme activity, specific activity and soluble protein *by T. reesei* were after 12 days, at 30 °C, pH 5, inoculum size 4% and 200 r.p.m. However the highest production of cellulolytic enzyme, soluble protein and specific activity by *Sclerotium cepivorum* were after 16days, at 21°C, pH. 4.5 and inoculum size 2%.

-The optimum concentration of $(NH_4)_2SO_4$, KH_2PO_4, Cacl2, Mg SO_4 and Tween 80 which resulted in the maximum value of soluble protein, cellulolytic enzymes and specific activity were 1.6, 4.0 , 0.4, 0.6, and 2.0 g/l. respectively for *T. reesei*. However, the values of these parameters were, 1.4 $(NH_4)H_2PO_4$, 3.0, 0.3, 0.3 and 2.0g/l for *S. cepivorum*.

-Vitamin B mixture raised the soluble protein, celluiolytic enzymes production and specific activity to the maximum values by using *T. reesei.* In spite of that sodium acetate increased these parameters obtained by *S. cepivorum.*

-For both fungi strains, addition of 5.0% filter paper to the cultivation medium in the presence of 2.0% beat pulp gave the highest values of cellulolytic enzymes production, soluble protein and specific activity.

-The maximum value of reducing sugars was obtained by saccharification of NaOH treated (rice straw and sugar cane bagasse) with enzyme filtrate of *T. reesei*. Meanwhile, the cellulolytic enzymes that produced from *S. cepivorum*, the maximum values of reducing sugars were obtained by hydrolysis of alkali treated rice straw.

Nagwa El-Shimi

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CONTENTS

Page

LIST OF TABLES