سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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سامية محمد مصطفى

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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بالرسالة صفحات لم ترد بالأصل

Zagazig University
Faculty of Science
Botany Department

STUDIES ON CELLULYTIC FUNGI

Thesis

Submitted in a Partial Fulfilment of the Requirements
of the Degree of Master

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NOTE

Besides the work carried out in the thesis the author has attended and passed successfully the following postgraduate cources.

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2- Plant Microbiology.

3- Plant Taxonomy.

4- Ecology and Flora.

5- Cytology and Genetics.

6- German Language.

This thesis has *not been previously submitted for a degree at this or any University*

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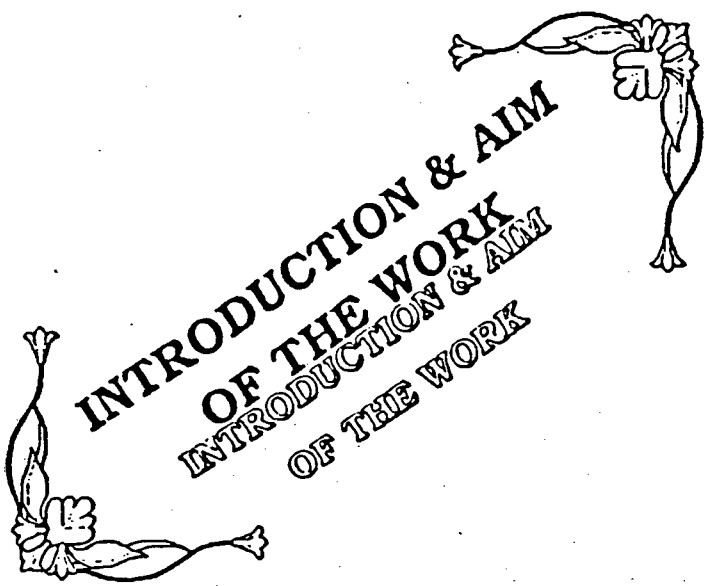

INTRODUCTION & AIM OF THE WORK

INTRODUCTION

Cellulose is a linear homopolymer of anhydroglucose units joined together by 1, 4-B-glucosidic linkages **(Tsao et al., 1978; Ryu and Mandels, 1980 and Chang et al., 1981)**. It is found in any cellulosic residue in a crystalline form. A cellulose is prominent carbonaceous constituent of higher plants and probably the most abundant organic compound in the nature.

Cellulose occurs in seed-bearing plants, in algae, and in many fungi. The cell wall of higher plants consists mainly of cellulose. It is found as submicroscopic rod-shaped units known as micelles. Number of polysaccharides are also associated with the cellulose of the plant cell wall, for example xylans, mannans and polyuronides. Arabans and galactans are sometimes present but in comparatively small quantities. The polysaccharides that are structurally linked with the cellulose of the cell wall have been termed cellulosans. Polysaccharides are usually insoluble and too large to pass through cell membranes. In order to pass to the inside of the cell, they have to be hydrolysed externally by certain exozymes to smaller molecules which are soluble and can penetrate the cell membrane. Two general type of oxozymes are involved.

Those hydrolyzing hexose units from the ends of polysaccharide chains, are called exohydrolases, and those attacking internal units, are called endohydrlases. Although both types of enzymes act indepently, the endohydrolases, by creating more chain ends, greatly increase the rate at which the exohydrolases can act.

Large parts of the vegetation added to soil are cellulosic material. The decomposition of this carbohydrate has a special significance in the biological

cycle of carbon. As a result, considerable attention has been given to the microorganisms participating in the decomposition of this substance.

Many fungi are able to digest cellulose and these are mainly responsible for the decomposition of plant materials on the forest floor. Among bacteria, however, cellulose digestion is restricted to only a few groups of Gram-negative and Gram-positive true bacteria and actinomycetes are the most common **(Goksoyr et al., 1975)**. Cellulose degrading activity are found among the obligate aerobic genera *Cellvibrio* and *Pseudomonas* **(Bevers, 1976; Ramasamy et al., 1980)**, facultative anaerobes *Cellulomonas* and *Bacillus spp* **(Choi et al., 1978, Rodriguez and Volfoa, 1984 and Hirata et al., 1985)** and obligate anaerobes *Clostridium spp.* **(Giallo et al., 1985 and Lee et al., 1985)**.

Microbial cellulases enzyme:

Cellulolytic microorganisms have multicomponent enzyme system which were separated using various chromatographic and electrophoretic techniques. **Klesov et al., (1980); Sinitsyn and Klesov (1981); Klesov and Grigorask (1981); Gong and Chang (1981)** and **Labudova and Farkas (1983)** revealed that, the cellulase enzyme complex resolved into at least "four" types of enzyme namely, cellobiohydrolase (C_1), Exo 1, 4-B-glucosidase (C_x), endogluconase and cellobiase.

The ability to produce cellulolytic enzymes is widespread amongest microorganisms. Many bacteria and fungi that are able to grow on native or pretreated cellulose do not, however, secrete cellulases into the medium. Some