شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومـــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قَسَـــم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

STUDIES ON BACTERIAL STALK-ROT DISEASE OF MAIZE

BY

ABD-ALLAH AHMED ALY EL-NAGGAR

B.Sc.(Plant Pathology) 1991

Faculty of Agric., Kafr El-Sheikh

Tanta University

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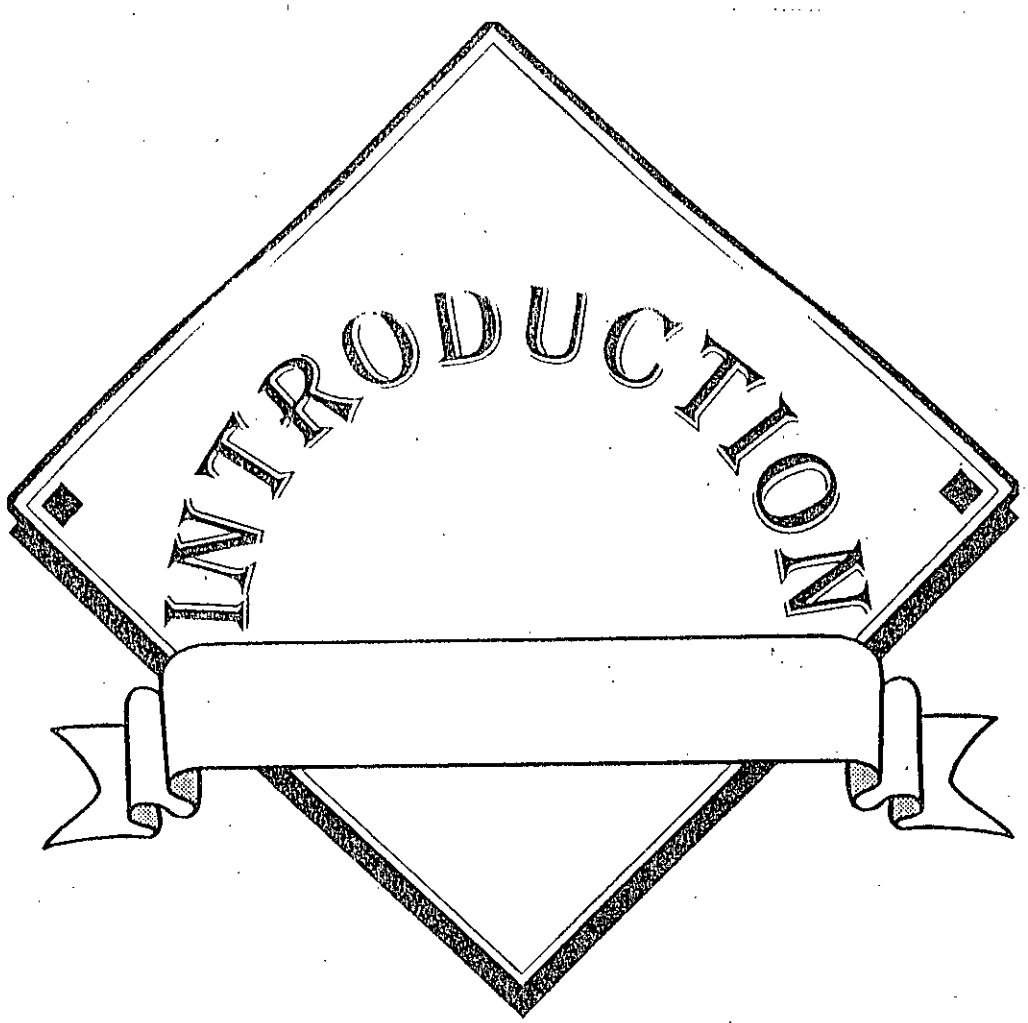
INTRODUCTION

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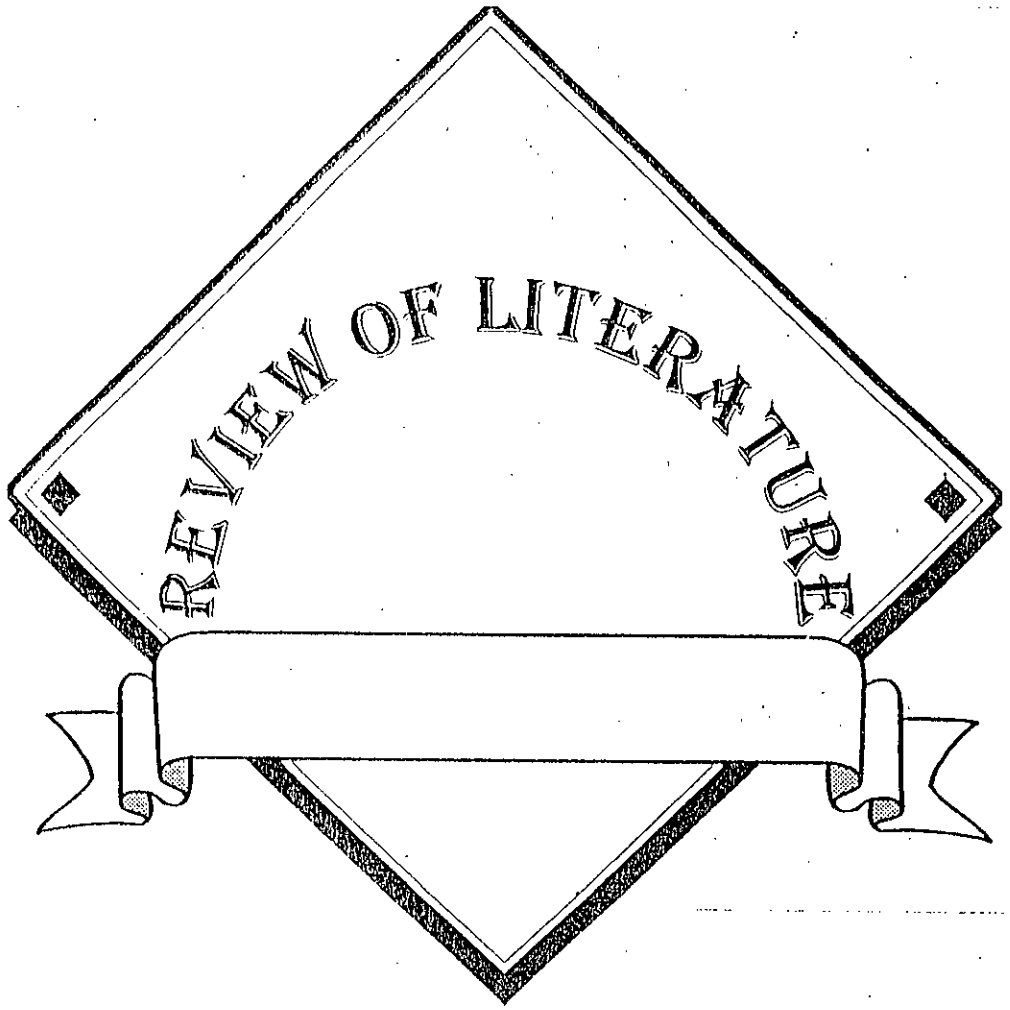
Maize (*Zea mays* L.) is considered one of the most important cereal crops in Egypt. Total area deviated to maize cultivation is about 1.6 million feddans in 1997 (Agricultural Economy Year Book, Ministry of Agriculture, August, 1998). Stalk-rot complex is one of the most serious diseases that affect maize productivity in Egypt. This complex is caused by several incitants; fungi and bacteria. Bacteria is an important component of stalk- rot and cause softening to the affecting stems with or without the other pathogens. *Erwinia carotovora* f. *zeae* is the main pathogen responsible for the bacterial stalk-rot (Sabet 1954).

A stalk-rot infection of maize plants was observed in different geographical regions of lower Egypt during the summer seasons of (1996 and 1997). The first symptom observed was wilting of the tips of uppermost leaves. At this stage, a soft rot develops in the stalk at the base of the whorl. The decay then spreads rapidly downwards through the stalk and soon the tops of affected plants drop down. The environmental and cultural factors that prevailed at those seasons were: high temperature (30-40 °c) and high relative humidity (90-95 %). This environmental factor causes losses in maize grain yield reaches almost 80-85% (Thind & Payak 1985). Bacterial stalk rot of maize plants was first reported in the USA and the causal agent was identified as *Phytomonas dissolvens* by Rosen in 1926. The disease was later reported in several countries and the pathogen responsible for the disease has been identified as *Erwinia carotovora* f. *zeae*, *E. maydis*, *E.carotovora*, *E.carotovora* var. *chrysanthemi* or *E.chrysanthemi*.

The main objective of this work is to identify the pathogen responsible for the stalk-rot condition of maize observed in the summer seasons of 1996 & 1997. All possible methods of identifications [Physiological and Biochemical Tests, dot-immunobinding assay (DIA) and sodium dodecyle sulfate polyacrylamide gel electrophoresis (SDS-PAGE)] were followed to characterize and find out whether there is diversity in the bacterial isolates under study or not.


REVIEW OF LITERATURE

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Occurrence and the Causal Agent of the Disease

The first report of the bacterial stalk-rot of maize in Egypt was made by Samra (1953). The disease also causes, under favorable conditions, serious damage to maize in most of the maize cultivating countries, (Panic and Ilic,1975; Hepperly & Ramos-Davila,1987; Masumi and Izadpanah, 1988; Wang, et.al.1991; Sathyanarayana and Begum, 1994). Sabet (1954) attributed the disease to *Erwinia carotovora* f. *zeae* and stated that the morphological, cultural and biochemical characters of this organism were similar to that of *E. carotovora*. However, the former differed from the latter in being able to infect maize and related host plants. A comparative studies was made by Sabet et.al. (1964) to some isolates of bacterial stalk-rot pathogen of maize from Egypt, India and USA, in addition to several isolates from different hosts of the world. It was found that these pathogens are closely related in their cultural and morphological characters but somewhat variable in certain biochemical reactions. They agree in their pathogenicity and relation to environment. The differences between *E. maydis* and *E. carotovora* were found to be well within strain variation and they did not justify the creation of a new species. The stalk-rot bacteria from Egypt, India and U.S.A.were distinguished by their ability to attack certain graminaceous plants which no other strain of *E.carotovora* can do. Isolates obtained by Hoppe et. al. (1969) from Wisconsin,USA have been compared with isolates of bacterium causing a similar disease in North Carolina,USA and also in Egypt. The cultures from three geographic areas were similar in key cultural