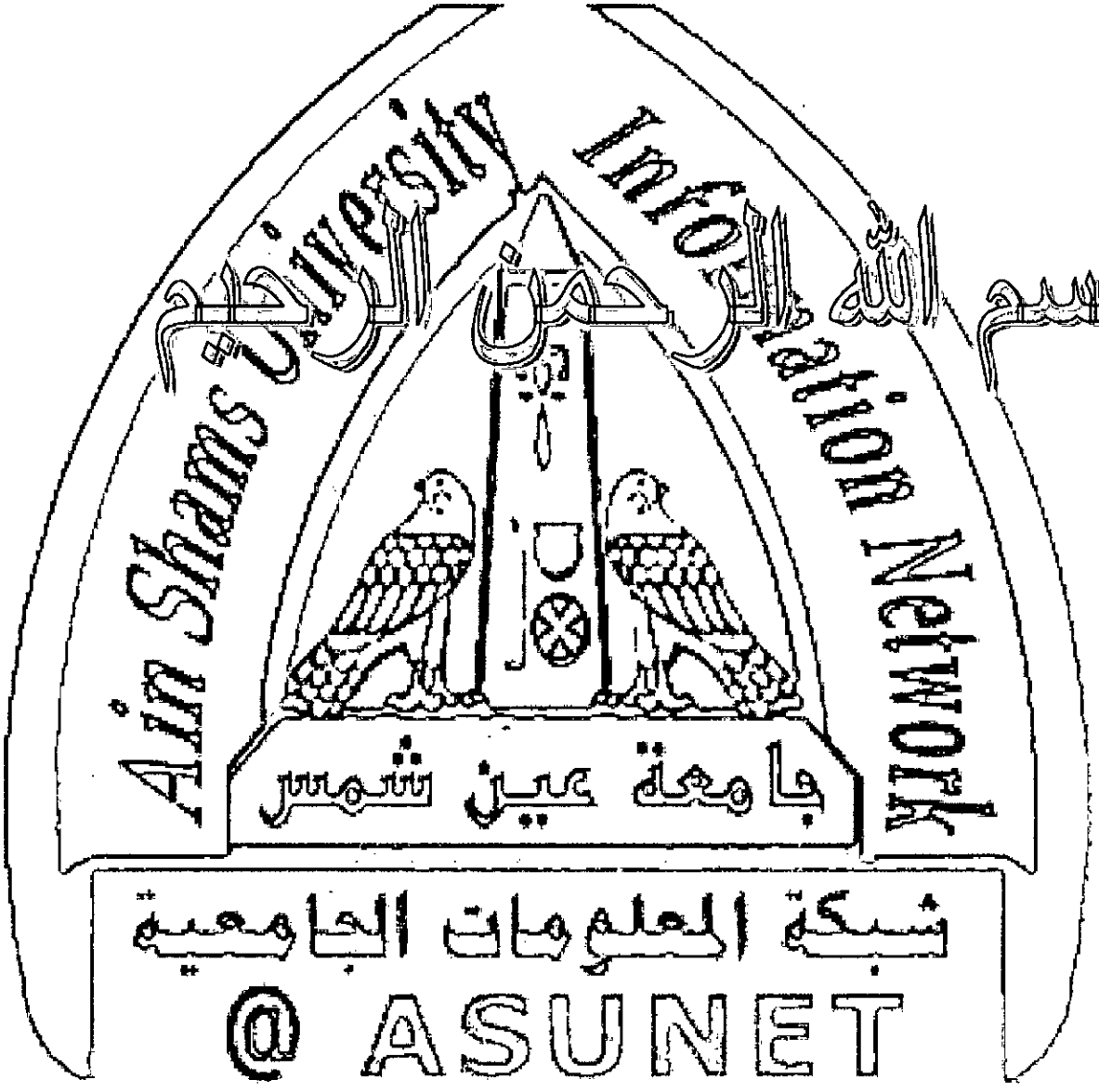
شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

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

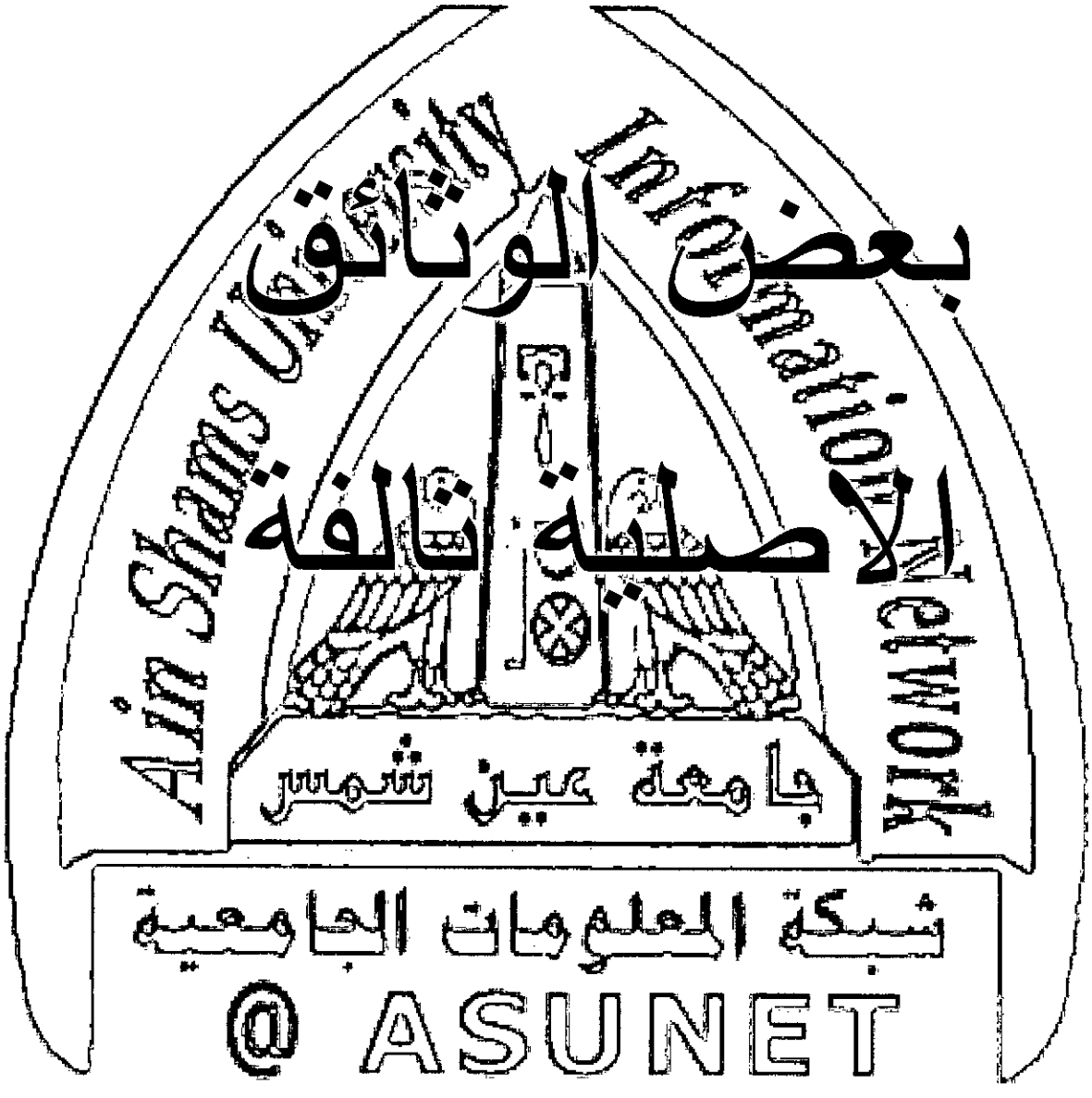
يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار
في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

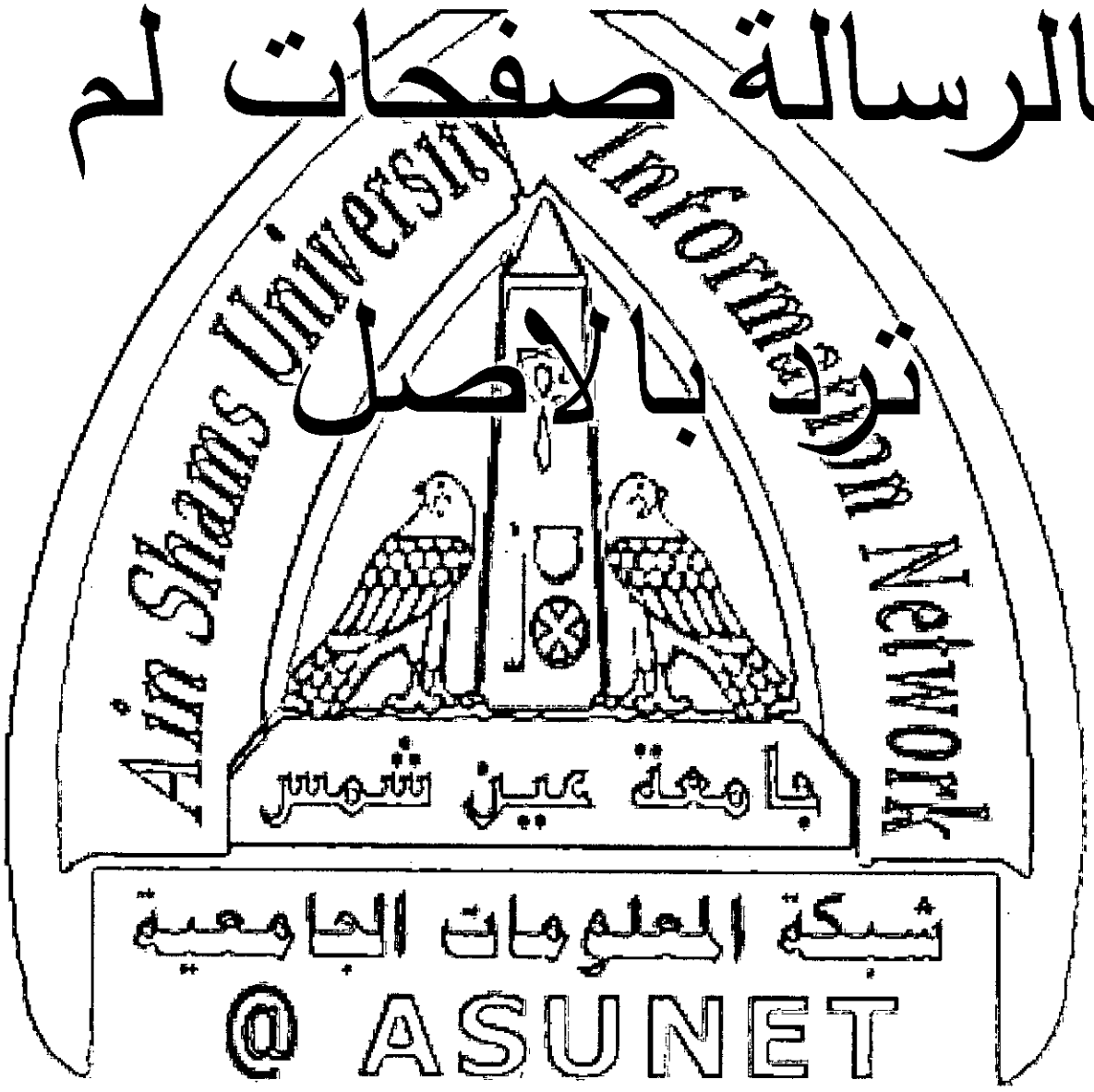
شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم



بعض الوثائق الأصلية تالفة

بالرسالة صفحات لم تردبالاصل



STUDIES ON THE ACTIVITY OF SOME MEDICINAL AND AROMATIC PLANT EXTRACTS IN CONTROLLING SOILBORNE DISEASES AFFECTING SUNFLOWER

BY
RADWA MAHMOUD SABRY AHMED SHAFIE
B. Sc. (Plant Pathology) , Cairo Univ., 1998

THESIS
Submitted in Partial Fulfilment of the
Requirements for the Degree of
MASTER OF SCIENCE
(Plant Pathology)

Plant Pathology Department
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Faculty of Agriculture
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2004

Approval Sheet

Department of Plant Pathology
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Title " Studies on the activity of some medicinal and aromatic plant extracts in controlling soil-borne diseases affecting sunflower"

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Contents

Name of Candidate Radwa Mahmoud Sabry Ahmed Shafie Degree M.Sc

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Supervisors Prof. Dr. Nour El Deen K. Soliman Prof. Dr. Moustafa S. Mansour, Profs. of Plant Pathol., Plant Pathol. Dept. Cairo Univ. Prof. Dr. Arafa A. Hilal Prof. of Plant Pathol., Plant Pathol. Inst., Agric. Res. Center.

Department Plant Pathology

Branch Plant Pathology Approval

ABSTRACT

Macrophomina phaseolina was the most isolated and pathogenic fungus, while *Fusarium oxysporum* and *Sclerotium rolfsii* were the less efficacy. *In vitro,* the cold watery extracts of rue, thyme, anise, eucalyptus and marjoram had an antifungal effect against the three mentioned fungi.

Rue and thyme extracts had the highest effect on *F. oxysporum* growth, sporulation and spore germination. Also, rue and thyme extracts had the highest effect on sclerotia formation and germination of both *M. phaseolina* and *S. rolfsii.* Rue and thyme plant extracted with petroleum ether were the most effective in inhibition fungal growth, sporulation, spore germination and sclerotia germination. Vitavax/Thiram was the most effective fungicide in lab. experiments. *In vivo,* rue and thyme extracts were more effective in controlling damping-off when they were used either as seed soaking for 30 minutes or as soil treatment with dry herb at 6 g/kg. soil. Vitavax/Thiram was the most effective as seed dressing. Considerable, promessing and applied data were detected in this study.

Use Other Side if Necessary

N. K. Soliman

(Cairo Univ. Press. 1624-1984-5000 ex.)

1-INTRODUCTION

Sunflower (*Helianthus annus*) is one of the major annual oil seed crops in the world. Since 1967, due to its advantages, it has occupied the second rank in the world oil crops. (Sackston, 1978). The cultivated areas increased from 28.666 to 43.000 feddansin 1975 and 1995 respectively,while it was decreased reaching 3103 feddans in 2003 (Agricultural Statistics, Ministry of Agriculture and Land Reclamination, Egypt). This crop as well other members of oily crops need more attention in the Egyptain agriculture in order to increase the national income instead of importing oils and loss hard currency.

Sunflower is attacked by several microorganisms which cause a large loss in seed and oil yield quality and quantity. Fungal pathogens *Fusarium oxysporum, Macrophomina phaseolina* and *Sclerotium rolfsii* are among the most important fungi attacking sunflowers (Saeed, 1990; Ahmed *et al.*,1994 and Vicente and Zazzerini, 1997). The use of fungicides for controlling fungal diseases is an expensive operation and may be hazardous to public health. In recent years, due to increase in environmental pollution, the need to find alternative to synthetic chemicals for the control of

fungal diseases has been increasingly felt in agriculture.Biological and genetic engineering techniques are of great importance in this situation (McLaren, 1986). Consequently, there is an increasing intrest in evaluating other control mechanisms including the effect of plant metabolites on plant pathogens. Secondry compounds, cosidered as final products of plant metabolism or metabolite refuses, have important ecological function for the plant which synthesize them. One of these functions is to protect the plant against infection by pathogens (Whittakar and Fenny, 1971; Swain, 1977 and Wink, 1988). In the last decades, different active constituents were extracted from various parts of plants especially medicinal and aromatic ones which are *in vitro* active against a large number of bacteria, fungi, yeast and viruses (Pandy *et al.*,1983; Reddy, 1987; Arya, 1988; Ress *et al.*, 1993; Arab,1994; Dwivedi, 1994; Arras *et al.*,1995; Inouye *et al.*,1998; Ahmed *et al.*,2000 and El-Shazly, 2000). Such compounds, being valuable selective for controlling some plant diseases. They are alkaloids, essential oils and phenolic compounds (Cepek, 1956; Agarwal and Mathela, 1979; Walters and Eilert, 1981; Bachir *et al.*, 1984 and Singh and Gupta, 1992). Several authers reported that most plant extracts have antifungal properties depend upon the

plant organ used, fungal species tested, solvent used for extraction and compound dose and structure (Moor and Atkins, 1977 and Ismail *et al.*,1989).

The present work aimed to investigate the efficiency of natural products of five Egyptain medicinal and aromatic plants such as aqueous and solvent extracts in inhibiting and controlling the chosen fungal pathogens and their diseases under laboratory and greenhouse conditions, respectively. Also, values of these products in controlling these pathogens in comparison with a fungicide were evaluated.

2-REVIEW OF LITERATURE

Soilborne diseases affecting sunflower; occurrence, symptoms and the causal pathogens:

Many pathogens were isolated from rotted roots of sunflower by many scientists.

Simmonds (1956) isolated *Sclerotium rolfsii* and *Macrophomina phaseolina* from crown and stem rots of sunflower. **Sackston (1957& 1958)** reported that sunflower plants were attacked by *Sclerotium bataticola* (*M. phaseoli*) and it caused stunting, blackish stem, undeveloped roots, dark externally and gray to greenish-gray internally, which can either become dry and brittle or rotted and soft. He added that the disease, caused more serious damage on mature sunflower plants than on young ones. **El-Helaly *et al.*(1966)** found that sunflower was attacked by *M. phaseolina.* **Middleton (1971)** reported that *S. rolfsii* caused basal-rot of sunflower plants. **Hulea *et al.* (1973)** observed the appearance of *M.phaseoli* in some commercial sunflower fields and many plants withered and died. **Orellana (1973)** isolated *Fusarium moniliforme* and *M. phaseolina* from root rot of sunflower plants in Texas. **A'cimovic (1975)** found that *M.phaseolina* was predominated in all sunflower growing districts of Iran and in some districts *Fusarium* sp. was found. **El-Zarka (1976)**