

**PATHOGENIC FUNGI IN PEAT MOSS AND SOIL AND
THEIR IMPACTION ON COVERED FARM VEGETAB-
LE CROPS**

Ali Hussain El - Behadli

**College of Agriculture, University of
Baghdad .**

ABSTRACT

Identification of pathogens and locating their inoculum source (S) are the first startigies toward successful disease management program the pretransplating seedling damping - off problem on vegetable crops was found to be caused by **Pythium aphanidermatum** and **Rhizoctonia solani**. Both fungi were isolated from peat (moss) for the first time in Iraq. In addition, considerable number of pathogenic fungi was found as contaminants in soil samples from Alrashidiah vegetable covered farming station. Among the isolated fungi were : **Pythium aphanidermatum**, **Rhizoctonia solani**, **Sclerotinia sclerotiorum**, **Fusarium oxysporum**, **Fusarium solani phialophora spp.**, **Cephalisporium spp** **Rizopus stolonfier** and **Botrytis cinerea**, in addition to several of other folair pathogens Economic important diseases such as vascular wilt, stem and root rots, blight and fruit rots were found to be caused by those fungi on tomato, cucumber, cucurbit.

Pathogenic Fungi on Vegetable Crops

eggplant and pepper plants that were grown at Alrashidiah. The results suggest that chemical, physical and / or biological treatments should be urgently applied for profitable vegetable growing at this station .

INTRODUCTION

Many of the soilborne fungi were recognized as devastated pathogens on various economic crops worldwide. Ecologically, temperature, humidity and organic matter content of covered farming soils from ideal niches components for those fungi. Much more economic losses, were reported to occur by those fungi in covered farming compared to that of uncovered. In Iraq, for instance fungal invasions on vegetable crops could be a major limiting factor of covered Farming success. Many noxious soilborne pathogens and several of the foliar pathogens were reported to invade vegetable crops in covered farmings (El - Behadli and Al - Azawi 1979). No previous investigation, however, had been done to determine the location of inoculum source (S) of those diseases. Moreover, great deal of seedling damping - off have been oftenly noticed on pretransplanted vegetable crops. This type of invasion could create a twofolds problem. Firstly it increases the cost of the imported vegetable seeds and secondly, the invaded plants with possible infectious pathogens will act as inoculum source in the field. The nature of such problem has not been understood yet.

This investigation, though was conducted to determine

the location of the inoculum sources (S) of the covered farming diseases and evaluate their impact on the field .

MATERIALS AND METHODS

This study was conducted at Alrashidiah green house station, Baghdad in 1987 - 1988. Our previous research suggested the possibility of fungi in causing pretransplanting vegetable seedling damping - off (unpublished (obdata) Therefore peat (Moss) (the medium for pretransplanting seedling preparation) and soil samples from the covered farming station were subjected for fungal analysis. Two isolation methods (baiting and dilution plate technique) (Hells and leach 1973) were utilized for fungal isolation. The isolated fungi were identified according to (Booth 1971, Waterhouse 1968, Gilman 1957, K. Eliss 1971, and Parmeter 1970). Pathogenicity of the isolated fungi was evaluated in the laboratory according to Tuite 1969. Plants of tomato, cucumber, cucurbit pepper and eggplant were routinely checked for fungal invasions through the growing seasons of 1987 - 1988. Disease occurrence and their causal pathogens were recorded. Correlation between the occurrence of fungi in soil and peat and fungal invasion was discussed .

RESULTS AND DISCUSSION

Identification of pathogens and locating their inoculum source (S) were the first strategies toward successful disease management programs. Results of this investig-

Pathogenic Fungi on Vegetable Crops

ation, reported the occurrence of two wide - host range fungi contaminated the peat for the first time in Iraq (Table 1) . Those fungi were *Pythium aphanidermatum* (Edson) Fitz and *Rhizoctonia solani* Kuhn. Isolates of both fungi were found to be pathogenic according to Tuites's procedure. Based on this finding the pre transplanting damping - off on seedling of vegetable crops were caused by those fungi. This result indicates that contaminated peat could be an inoculum source for both fungi in the field. The results also revealed a considerable number of soilborne pathogenic fungi, in addition to *Rhizoctonia solani* and *pythium aphanidermatum* presented in covered farming soils. The following fungi were isolated from soil samples: *Sclerotinia sclerotiorum* (Lib) De Bary, *Fusarium oxysporum* F. *solani* (Mart) Sacc, *Phialophora* sp., *Cephalosporium* sp. and *Botrytis cinera*, in addition to several other foliar pathogens. All the planted vegetables in 1987 - 1988 were invaded by those fungi. The diagnostic results in this study indicated the incidence of the following diseases: vascular wilting, root and stem rots, blight, white roset and grey mold and fruit rots on all the grown vegetable crops. This finding clearly indicates the possibility of inoculation building up of the soilborne pathogens at this station due to improper disease management. Therefore, physical, chemical and/or biological approaches to disinfect peat and soils from pathogenic fungi should be urgently taken place for profitable vegetable growing .

Table 1. Incidence of pathogenic fungi in peat (moss) and soil samples and discs caused by them on covered Farming vegetable crops.

Pathogenic fungi in	Diseases	Hosts
A. Peat (Moss)		
<i>Pythium aphanidermatum</i>	—Seedling damping-off	All vegetable crops
	—Seed decay	All vegetable crops
<i>Rhizoctonia solani</i>	—Seedling damping-off	All vegetable crops
	—Seed decay	All vegetable crops
<i>Penicillium</i> spp	—Saprophyte	All vegetable crops
B. Soil		
<i>Pythium aphanidermatum</i>	Stem and root rot	Cucumber and cucurbit
<i>Rhizoctonia solani</i>	Stem and root rot	All vegetable crops
<i>Sclerotinia sclerotiorum</i>	Stem rot	All vegetable crops
	—white mold	All vegetable crops
<i>Fusarium oxysporum</i>	Vascular wilting	Eggplant
<i>Fusarium solani</i>	Root rot	Eggplant and tomato
<i>Rhizopus stolonifer</i>	Fruit rot	Cucurbit
<i>Botrytis cinerea</i>	grey mold	All vegetable crops
	—Blight	All vegetable crops
<i>Alternaria alternata</i>	Fruit rot	Tomato, cucumber and cucurbit
<i>Phialophora</i> spp	Fruit rot	Tomato, cucumber and cucurbit
<i>Cephalosporium</i> spp	Fruit rot	Tomato and cucumber
<i>Cladosporium herbarium</i>	Fruit rot	Tomato, cucumber and cucurbit
<i>Trichoderma harzianum</i>	Fruit rot	Tomato and pepper and cucumber
<i>Mucor</i> spp	Fruit rot	Tomato and pepper and cucumber
<i>Stemphylium botryosum</i>	Fruit rot	Tomato, cucumber and cucurbit

Pathogenic Fungi on Vegetable Crops

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اهمية الفطريات الممرضة الموجودة في البتموس والتربة على زراعة الخضر المغطاة .

كلية الزراعة - جامعة بغداد علي حسين البهادلي

المخلص

التعرف على مسببات الامراض ومصادر العدوى هو اول استراتيجية برنامج الادارة المتكاملة الناجحة، فلقد وجد ان مشكلة هلاك البذور والدايات المبكر يتسبب عن الفطرين :

Rhizoctenia solani و **Pythium aphanidermatum**

الملوثين لوسط البتموس المستخدم في انتاج الديات . كما اكد فحص عينات التربة الزراعية للبيوت الزجاجية في الراشدية انتشار فطريات اخرى اضافة للنوعين السابقين اهمها :

Fusarium solani و **Sclerotinia sclerotiorum**...

Cephalosporium sp. و **Phiallshora sp.**...**Fusarium oxysporum** , **Botrytis cinerea** , **Rhizopus stolonifer**

لقد تكتشفت امراض مختلفة خلال الموسم الزراعي مرتبطة بوجود الفطريات المذكورة انفا منها : الذبول الوعائي ، تعفن الجذور وقواعد السيقان ، اللفحة وتعفن الثمار في عدد من محاصيل الخضر كالطماطة والخيار والقرع والباذنجان والفلفل المزروعة في البيوت الزجاجية - الراشدية .

ولكي يتحقق انتاج مربح في هذه المزرعة لابد من اجراء معاملات سريعة متكاملة للوقاية من هذه الامراض كاستخدام المبيدات ، المعاملات الفيزيائية والبايولوجية للوسط العضوي والتربة الزراعية .