

STUDIES ON ISOLATION OF DIFERENT TYPE OF FUNGI TO CAUSE THE WILT DISEASE IN CHICKPEA (*CICER ARIETINUM L.*)

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Abstract

Chickpea wilt caused by *Fusarium oxysporum f. sp. ciceris* (FOC) is one of the most destructive disease in India. It is seed-borne as well as soil-borne pathogen. During present investigations seven isolates of *Fusarium oxysporum f.sp. ciceri* representing two districts and one Agro climatic region of India were analysed for their pathogenic variability study. iversity was studied among the eighteen virulent isolate using RAPD. All the isolates proved to be pathogenic to susceptible cv. JG-62. From which, three isolates were found highly pathogenic (71100%), two were strongly pathogenic and one moderately pathogenic to cv. JG-62. Genetic d.

Keywords: Destructiv Disease, Pathogenic Variability, Pathogen, Climatic Region.

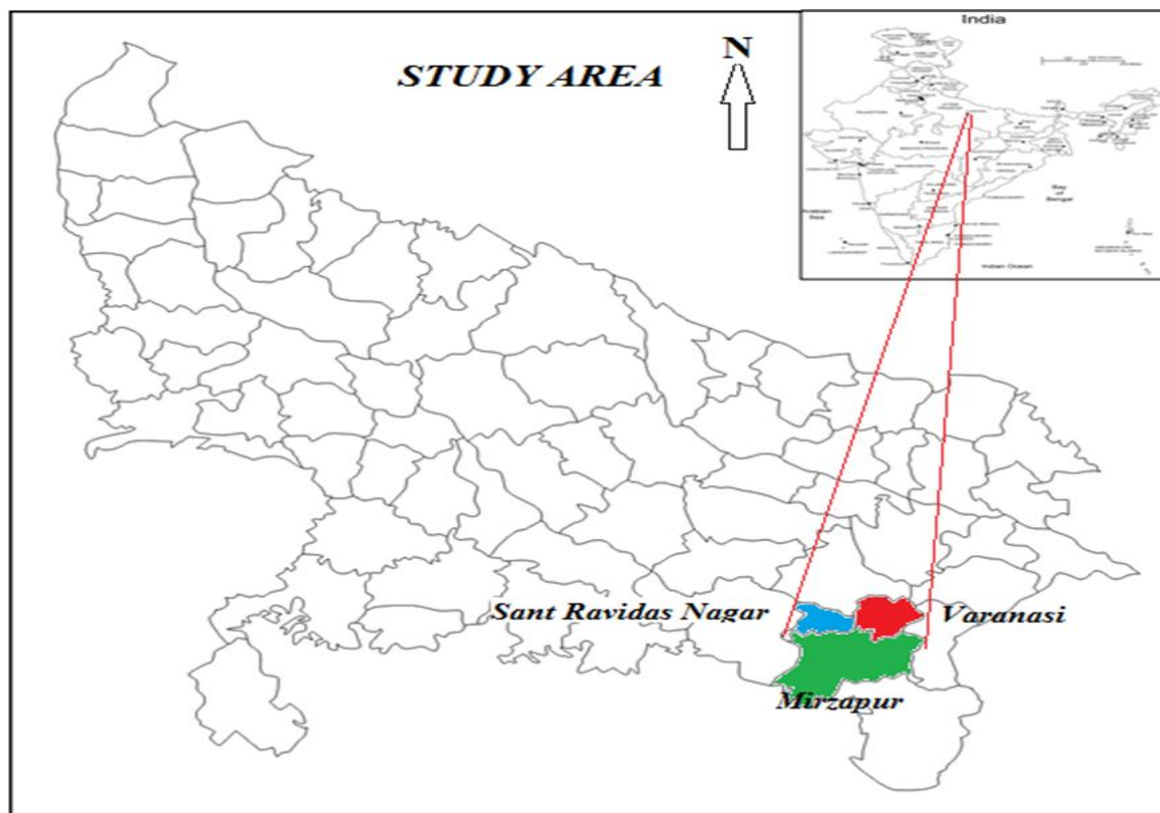
Introduction

The Chickpea (*Cicer arietinum L.*) has always been considered as an important part in the farming system in the Mediterranean countries. It represents a pulse of wide consumption. (Laumont and Chevassus,1956). Chickpea in Algeria is affected by various fungal diseases and in a previous work we identified various important diseases whose primary is without doubt the blight caused by *Ascochyta rabiei* (Merzoug et al., 2009). Fusarium wilt is a common vascular wilt fungal disease, exhibiting symptoms similar to *Verticillium* wilt. The pathogen that causes Fusarium wilt is *Fusarium oxysporum* . *Fusarium oxysporum* generally produces symptoms such as wilting, chlorosis, necrosis, premature leaf drop, browning of the vascular system, stunting, and damping-off. The status of chickpea diseases varies from country to country. Soil-borne fungal diseases of chickpea, like wilt, damping off and root rot, are cosmopolitan (Haware et al. 1990).

Chickpea wilt caused by *F. oxysporum f.sp. ciceris* is widespread and has been reported from almost all the chickpea-growing regions in the world (Haware et al. 1991).The most important of these is vascular wilt. Fusarium wilt starts out looking like vein clearing on the younger leaves and drooping of the older lower leaves, followed by stunting of the plant, yellowing of the lower leaves, defoliation, marginal necrosis and death of the plant. On older plants, symptoms are more distinct between the blossoming and fruit maturation stages. Chickpea, *Cicer aritinum L.* is the world third most important pulse crop. India rank first in terms of chickpea production and consumption in the world. Low yield of chickpea is attributed to its susceptibility to several fungal, bacterial and viral diseases. Chickpea wilt incited by *Fusarium oxysporum f. sp. ciceris* is one of the serious diseases causes annual loss at 10 per cent in yield (Dubey et al., 2007). *F. oxysporum* survive as mycelium and chlamydospores in seed and soil, and also on infected crop residues, roots and stem tissue buried in the soil for up to 6 years and yield losses of up to 72.16 per cent may occur under favourable condition (Kumar, S. and V.A. Bourai, 2012).

Study area

The present study was conducted in Varanasi districts of utter Pradesh state In India. First study field situated 16 km from main districts Varanasi, second is 13 km and third is 1 at 25.31 76 N° latitude and 82.97 39° E longitude.



Materials and Methods

The Research study was carried out between 20 December 2017 to 25 April 2018 in the Bhargawa Agricultural Botany laboratories, Department of Botany university of Allahabad Prayagraj (U.P) India.

Disease Infected plants were collected from survey conducted in Varanasi, Mirzapur, Sant Ravidash nager (Bhadohi) in the winter season 2017-18. 12 infected plants with Disease symptoms kind of wilt, is like fall of Leaves with or without chlorosis, were randomly selected from each of 35 further plants from the wilted chick pea plot.

Isolation of fungi

Method –I have used sub culturing method for isolation and purification of fungi and maintaining on Potato dextrose agar medium (PDA).

Potato dextrose agar plate method: The agar plate method, is popular method, in which seeds are plated on an agar medium and the plated seeds are usually incubated for 5-7 days at 22-25°C under 12h alternating cycles of light and darkness. At the end of the incubation period, fungi growing out from seeds on the medium are examined and identified. Identification is based on colony characters and morphology of sprouting structures under a compound microscope.

Isolation of soil fungi from Chick pea cultivated area-

The samples were processed in an isolation process using the soil dilution plate (Waksman 1922). The soil fungi were isolated following the soil dilution plating technique (Johnson et al., 1960). Dilution technique is given by Warcup (1950) and was used to isolate the fungi from soil sample weighting 1g was diluted in 10 ml of distilled water. 1 ml of diluted sample was poured and spread on petri plates containing sterilized PDA medium (Extract from 250g of potato boiled and filtered), dextrose 20g, agar-agar 15g and distilled water 1000 ml PH 7.0) in

replicates. The Inoculated plates were incubated in a dust free cupboard at the room temperature pouring into petri plates for controlling bacterial growth.

Table – 1 Soil borne Fungi isolated from soil samples which were collected from different Pigeon pea growing areas in Varanasi, Mirzapur and Sant Ravidash Nagar (Bhadohi) districts in Uttar Pradesh.

S.N	Fungal Genera	Fungal species	Varanasi		Varanasi		Varanasi	
			First sight		Second sight		Third sight	
1	<i>Fuserium</i>	<i>F. oxysporium</i>	+	+	+	+	+	+
		<i>F. cucumerium</i>	-	+	-	-	-	+
		<i>F. melonis</i>	+	+	-	-	+	-
		<i>F. niveum</i>	-	+	+	+	+	-
S.N	Isolated fungi		Varanasi 1		Varanasi 2		Varanasi 3	
1	<i>Fusarium acuminatum</i>		+		-		-	
2	<i>Fuserium oxysporum</i>		+		+		+	
3	<i>Fuserium avenaceum</i>		+		+		-	

Table: (3) fungal species isolated from Chickpea crop

Result and Discussions

Chick pea samples collect from different places of my study area in Varanasi District of utter Pradesh. I have been Isolated fungal pathogens in infected plant sample. And I am also isolated the pathogen in soil sample. During pathogen Isolation I am used Ager plate method.

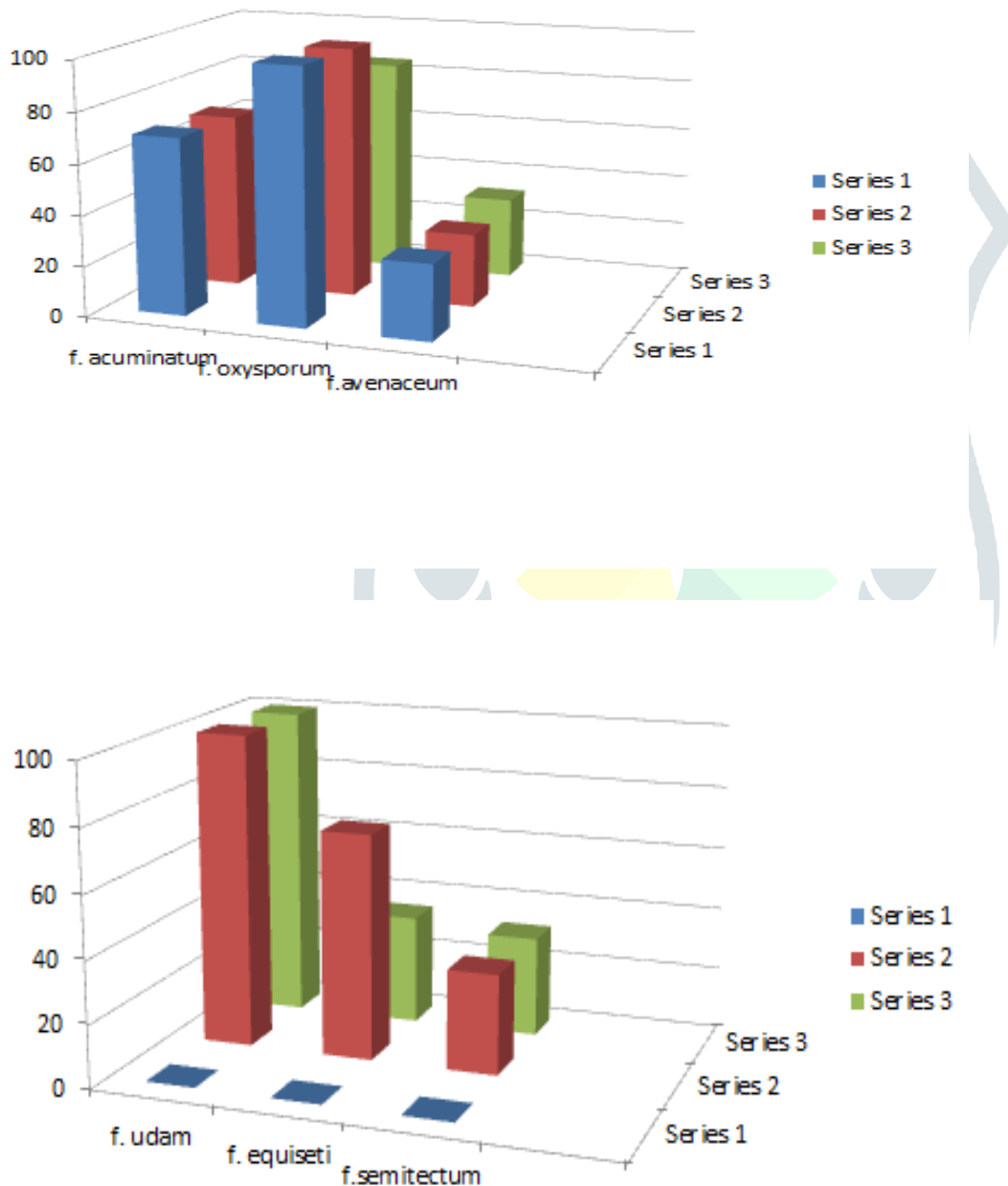
I have Isolated four fungal species of *fuserium* Genera in soil sample. (Table 1) all four fungal species found in Varanasi district of utter Pradesh, but not found all these four species in all sampling places. *Fuserium oxysporium* is only species found in all sampling places. name of isolated fungi is *Fuserium oxysporium*, *Fuserium cucumenium*, *Fuserium melonis*, *Fuserium niveum*.

. All the isolates proved to be pathogenic to susceptible cv. JG-62. From which, three isolates were found highly pathogenic (71100%), two were strongly pathogenic and one moderately pathogenic to cv. JG-62. Genetic d.

Conclusions

The total number of four fungal species of *Fusarium* Genera Isolated in soil sample. Soil sample collected from Chickpea cultivated field in Varanasi district of Uttar Pradesh. And also three *Fusarium* species recovered from disease infected chick pea plant. Infected plant sample collected from Varanasi district of Uttar Pradesh. All the isolates proved to be pathogenic to susceptible cv. JG-62. From which, three isolates were found highly pathogenic (71.100%), two were strongly pathogenic and one moderately pathogenic to cv. JG-62. Genetic diversity was studied among the eighteen virulent isolate using RAPD.

Graphical representation



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