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SURVIVAL ABILITY OF RESISTANT ISOLATE OF *FUSARIUM OXYSPORUM F.SP.CAPSICI* IN MIXED POPULATION

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ABSTRACT

In the present investigations was designed to explore the survival ability of benomyl resistant *Fusarium oxysporum f.sp.capsici* causing chilli wilt (*Capsicum annum*) in mixed population. On the untreated chilli plants, resistant population in the mixture was reduced from passage to passage. But on the benomyl treated chilli plants, resistant population was increased from passage to passage. Thus, benomyl treatment to chilli plants imposed such a selection pressure on the population that only resistant population is able to survive at 4th passage indicating it was more fit for its survival in the mixed population.

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INTRODUCTION

Chilli is an important group of vegetables commercially grown as condiment; is essential for all Indian dishes. It is important cash crop in India and grown for its fruits which are used green and ripe in the food. Such useful plant has been attacked by many fungal pathogens of which Chilli Wilt caused by *F. oxysporum f.sp. capsici* is very serious fungal pathogen which causes significant loss. This pathogen is controlled by using benomyl, but frequent use of benomyl can lead to the development of resistance in the pathogen. It is necessary to know the survival ability of such resistant mutant in mixed population. So, fitness of benomyl resistant mutant of *Fusarium oxysporum f.sp. capsici* among the sensitive population was evaluated in the absence and presence of benomyl.

MATERIALS AND METHODS

To find out survival ability of benomyl resistant isolates of *Fusarium oxysporum* f.sp. *capsici* causing wilt of chilli, mycelial suspension in sterile distilled water were prepared from 8 days old cultures of benomyl sensitive isolate *Fusarium oxysporum* f. sp. *capsici* (FOC-10) and resistant isolate (FOC-5). The mycelial suspensions from these two isolates were mixed in the following three proportions:

Sensitive	Resistant
90	10
75	25
50	50

Clean, healthy benomyl (140µg/ml) treated and untreated plants of chilli were inoculated with the suspension of above three mixtures individually. After eight days of incubation period, mycelial suspension (1ml in 100 ml sterile distilled water) was prepared from infected stem separately. The suspension from each of the above mentioned mixtures were used for inoculation of chilli plant for the next (second) passage. Prior to inoculation at each passage 5 ml samples were taken from each mycelial suspension and were diluted with sterile distilled water to approximately 100 mycelial fragments per ml. One ml of suspension was then pipetted out on to the surface of 15 ml water agar plates and incubated at 26±3ºC for eight days in dark till the colonies of

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Table 1. Ratio of sensitive (S) and resistant (R) isolates (S: R) in benomyl treated passage and untreated passage

Original mixture	Benomyl Treated Passage				Untreated Passage			
	I	II	III	IV	I	II	III	IV
S:R	S:R	S:R	S:R	S:R	S:R	S:R	S:R	S:R
90:10	58:42	45:55	32:68	18:82	58:42	64:36	79:21	92:08
75:25	80:20	66:34	54:46	35:65	40:60	53:47	65:35	82:18
50:50	50:50	40:60	27:73	10:90	45:55	62:38	74:26	91:08

F. oxysporun f.sp.capsici become visible. Many colonies with surface mycelium appeared on the plates out of which 100 colonies from each mixture were transferred on to the Czapek Dox agar plates containing benomyl (2X of MIC) a concentration lethal to sensitive isolate. The plates were again incubated at 26±3ºC for eight days. The surviving colonies were counted and their composition was examined. Same procedure was followed for four successive passages.

RESULTS AND DISCUSSION

On the untreated chilli plants, resistant population in the mixture was reduced from passage to passage. But on the benomyl treated chilli plants, resistant population was increased from passage to passage. Thus, benomyl treatment to chilli plants imposed such a selection pressure on the population that only resistant population is able to survive at 4th passage indicating it was more fit for its survival in the mixed population (Table 1). Similar results were obtained by other workers in case of other pathogens resistant to different fungicides including benomyl. According to Horsten (1979) carbendazim resistant strains of *Septoria nodorum* were morefit to survive in the mixed population of sensitive strain in the presence of fungicide. Selection pressure of fungicide should not be increased since it improves the fitness of the resistant isolates (Wolfe, 1973).

Kamble (1991) reported that on untreated potato tubers population of resistant isolate of *Macrophomina phaseolina* causing charcoal rot of potato in the mixture of sensitive population of *M. phaseolina* was reduced from passage to passage. While on the carbendazim treated tubers resistant population was increased from passage to passage. Therefore, in order to reduce the benomyl resistant population of *Fusarium solani*, the selection pressure must be lowered by either mixing benomyl with competent companion fungicide or agrochemicals or by discontinuing use of benomyl for some period.

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