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INTERACTION BETWEEN *Pythium Aphanidermatum* and *Meloidogyne Incognita* IN CHILLI AND BRINJAL

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ABSTRACT

The interaction effect of *Pythium aphanidermatum* (Edson) Fitz. and *Meloidogyne incognita* (Chitwood, 1949) was tested in field. The concomitant inoculation of *P.aphanidermatum* and *M.incognita* caused maximum pre-and post-emergence damping-off in both chilli cv.Co2 and brinjal cv.Co2. The dry shoot and root weight of the plants infected with *Pythium* and *Meloidogyne* were found to be reduced significantly.

KEY WORDS: Interaction, *Pythium-Meloidogyne* complex.

Chilli (*Capsicum annum* L.) and brinjal (*Solanum melongena* L.) are the most important vegetable crops grown in India. These two crops are often affected by several fungal, bacterial, viral and nematode diseases. Among these, the fungal disease *viz.*, 'damping-off' due to *Pythium* spp. is of considerable importance, since the crop is damaged in the early growth phase. Among nematodes, root-knot nematode, *Meloidogyne* spp. is important since it forms root-knots from the early stage of the crop. Since both *Pythium* and *Meloidogyne* are soil borne, the complex disease caused by *Pythium* sp. and *Meloidogyne* sp. cause serious damages to these two crops. Hence, the study of interaction effects has importance in the management of this disease complex.

MATERIALS AND METHODS.

The isolates of the fungus *Pythium aphanidermatum* were isolated from the infected chilli and brinjal seedlings by using tissue segment method on potato dextrose agar medium and the pure cultures were obtained by single hyphal tip method. These chilli and brinjal isolates were multiplied on sand-maize medium. The roots of tomato infested with *Meloidogyne incognita* were collected and the roots were examined for the presence of the nematode. A monoculture of *M.incognita* was raised in autoclaved soil on tomato in glass house and the culture was checked periodically for purity.

Two separate field trials were laidout to test the interaction effect of *Pythium* and *Meloidogyne* in chilli and brinjal. The experiment was laid in a randomized block design (RBD) with five replications. The treatments were T1) - *M.incognita* alone inoculated, T2) - *P. aphanidermatum* alone inoculated, T3) -*M. incognita* + *P. aphanidermatum* inoculated, T4) - Uninoculated control.

The bed size was 20 x 20 cm with 60 cm gap inbetween the beds. *P. aphanidermatum* multiplied on sand-maize medium (at 1:20 w/w) and *M. incognita* (at 500 eggs/bed) infected root bits were mixed with the soil as per treatment. Chilli cv.Co2 and brinjal cv.Co2 seeds having good germination were sown at the rate of one gram/bed. The germination percentage of the seeds were determined by roll towel method.

The weekly plant stand was taken by counting the normal seedlings. The nematode gall-index was determined by using 1-5 scale, where, 1) Less than 1 per cent, 2) 1 to 25 per cent, 3) 26 to 50 per cent of total roots galled 4) 51 to 75 per cent, 5) 76 to 100 per cent. The seedlings were dried in an oven at a temperature of 70°C for 24h and the dry shoot weight were determined at 45 days after sowing.

RESULTS AND DISCUSSION

To study the effect of interaction of *P. aphanidermatum* and *M. incognita* on chilli and brinjal, the plant stand, dry shoot weight, root weight and nematode gall-index were recorded at 45 days after sowing. It was revealed that there was a significant reduction in plant stand, dry shoot weight and root weight in nematode and fungus inoculated beds when compared to uninoculated control beds.

Table 1. Interaction of *Pythium aphanidermatum* and *Meloidogyne incognita* on chilli

Treatments	Percent incidence of damping-off		Dry shoot weight/ plant (g)	Dry root weight/ plant (g)	Gall index
	Pre-emergence	Post-emergence			
M. incognita alone	10.53 (18.91)	22.33 (28.18)	0.845[b] (29.23)	0.326[b] (13.79)	3.0
P. aphanidermatum alone	22.58 (28.39)	31.88 (34.39)	0.728[c] (39.03)	0.271[b] (28.12)	1.0
M. incognita + *P. aphanidermatum*	32.70 (34.88)	38.90 (38.65)	0.589[c] (50.67)	0.192[d] (49.07)	3.0
Control (Uninoculated)	0.00	0.00	1.194[a]	0.377[a]	1.0
CD (P=0.05)	0.808	0.689	1.194	0.043	-

* Figures in parantheses under are per cent incidence columns are transformed values. While, figures in parantheses under dry shoot and root weight columns are per cent reduction over control.

* In the columns each figure followed by the same letter do not differ significantly at 5 per cent level by DMRT.

Damping-off of chilli and brinjal seedlings was maximum in the treatment which received both fungus and nematode as inoculum. The pre-emergence damping-off was 32.7 per cent and 47.66 per cent in chilli and brinjal while the post emergence damping-off was 38.9 per cent and 53.1 per cent (Table 1 and 2) in chilli and brinjal respectively. Due to interaction of *Pythium* and *Meloidogyne* on chilli and brinjal, a drastic reduction in the plant stand was observed. This observation is commensurate with the findings of Hasan (1985) on chilli. It may be concluded that synergistic effect of infection by the fungus and the nematode leads to reduced plant stand, the latter rendering the host plant more susceptible to the fungal pathogen, by altering the host metabolism.

The dry shoot weight was greatly reduced in fungus and nematode inoculated beds. The per cent reduction over control was 50.67 in chilli and

Table 2. Interaction of *Pythium aphanidermatum* and *Meloidogyne incognita* on brinjal

Treatments	Percent incidence of damping-off		Dry shoot weight/ plant (g)	Dry root weight/ plant (g)	Gall index
	Pre-emergence	Post-emergence			
M. incognita alone	26.01 (30.66)	31.97 (34.45)	0.864[b] (28.54)	0.284[b] (17.92)	3.0
P. aphanidermatum alone	35.89	42.01 (26.81)	0.736[bc] (40.40)	0.254[c] (39.12)	1.0 (26.59)
M. incognita + *P. aphanidermatum*	47.66 (43.68)	53.10 (46.78)	0.675[c] (44.17)	0.193[c] (44.22)	2.6
Control (Uninoculated)	0 (2.90)	0 (2.90)	1.209[a]	0.346[a]	1.0
CD (P=0.05)	0.797	0.866	0.143	0.042	0.377

* Figures in parantheses under per cent incidence columns are transformed values. While, figures in parantheses under dry shoot and root weight columns are per cent reduction over control.

* In the columns each figure followed by the same letter do not differ significantly at 5 per cent level by DMRT.

44.17 in brinjal where as in fungus alone inoculated beds it was 39.03 in chilli and 39.12 in brinjal. All the three treatments differed significantly. The dry root weight was minimum in fungus and nematode inoculated beds. The per cent reduction over control in fungus and nematode inoculated beds was 49.07 in chilli and 44.22 in brinjal, whereas it was 28.12 in chilli and 26.59 in brinjal in fungus alone inoculated beds and it was 13.79 and 17.92 per cent in nematode alone inoculated beds. According to Hasan (1985) the root weight of chilli plant was found to be reduced when *Pythium* and *Meloidogyne* were inoculated simultaneously. This reduction in dry shoot weight and root weight was also observed in cowpea plants inoculated with *M.incognita* complex. (Lanjewar and Shukla, 1985) and in lettuce due to infection by *P.trachiphilum - M. hapla* complex (Gracia *et al.*, 1991). The reduction in the dry shoot and root weight of the plants infected with *Pythium* and *Meloidogyne* is an indication of reduced vigour of the plants, which would ultimately lead to their poor establishment in main field after transplanting and also poor yield.

The highest gall-index of 3.00 was observed in *Meloidogyne* alone inoculated beds of chilli and brinjal which was followed by simultaneous inoculation of *Meloidogyne* and *Pythium*. The root-knot nematode is an obligate parasite and cellular destruction by another pathogen would naturally result in suppression of nematode multiplication.

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TMV 6-A NEW HIGH YIELDING MEDIUM DURATION CASTOR FOR TRADITIONAL CASTOR GROWING AREAS OF TAMILNADU

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ABSTRACT

The new castor variety TMV 6 (TVC 31) is a hybrid derivative of VP 1 (a stable pistillate line) and RC 962 (a high yielding pollinator) with desirable characteristics viz., medium duration (155 to 165 days), non dehiscent spiny capsules borne on mostly pistillate racemes and high oil content of 51.9 per cent. It gives an average yield of 928 kg/ha under pure cropping and 568 kg/ha under intercropping situations.

KEYWORDS : Castor, TVC 31, medium duration

Castor is one of the most important oilseed crops grown during kharif season in Salem, Dharmapuri and Erode districts which form the traditional castor growing tract. Of late, castor is gaining importance owing to its wide utility in the industrial and pharmaceutical sectors. It is normally grown as an intercrop in groundnut or pulses. In general, medium duration varieties are preferred by the farmers for intercropping. TMV 6 is one such high yielding medium duration variety which is suited for both pure and intercropping situations.