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PATHOGENICITY POTENTIAL OF MELOIDOGYNE INCOGNITA IN SOYBEAN

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Soybean (*Glycine max*) it is also known as golden Bean is the largest oil seed crop in world accounting for more than 50% of the world oilseeds production. Above 80% of the global soybean output is crushed worldwide production.One of the major limiting factors to the profitable soybean production is the damage caused by plant-parasitic nematodes especially Meloidoygyne species. The extent of damage is influenced by the cultivar nematode species (1). The presence of root-knot nematode causes the deformation of the root system when galls are formed nutrient and water uptakes by plant roots are then affected.Infection by Meloidogyne species can also lead to reduced nodulation by nitrogen fixing bacterial (2). Similarly infection due toMeloidogyne causes wounds on soybean root while feeding. These wounds provide entry points for secondary pathogenic infection. Thus the plant becomes susceptible to root rotting organism. M. incognita causes significant yield loss of soybean (3) by as much as 90% for susceptible soybean cultivars (4). Annual soybean yield losses to this nematode still exceed 99,600 metric tonnes in the United States of America (5). Keeping in view of the above an attempt was made to know pathogenic potential of the high inoculums level of M.incognita in soybean crop.

Fifteen earthen pots of 30cm diameter were washed with water, previously disinfected with 4% formaldehyde and filled with autoclaved at 121°C for 30 minute sterilized sandy soil @ 3kg/pot. Four seeds of root-knot susceptible soybean variety JS 335 were planted in each pot. 15 day after germination plants were thinned out to one/pot before inoculation of Meloidogyne incognita (J2) larvae. The inoculum of Meloidogyne incognita (J2) was collected from Branjal plants and after grinded . The infected root samples were thoroughly washed under tap water. The roots were cut into small pieces and grinded using grinder and 2nd stage juveniles were separated through series of sieves and collected in the beakers Meloidogyne incognita was measured and blowing through the pipette to ensure uniform distribution of population. One ml of the suspension was withdrawn with the help of pipette into counting dish and the population of juveniles (J2) was counted under binocular, microscope Meloidogyne incognita larvae were inoculated @ 500, 1000, 1500, 2000/pot in plant rhizosphere after making a ring around the stem. Uninoculated plant served as control. Each treatment was replicated three times. The experimental pots were employed in completely randomized design (CRD) and were kept in net house at 24-34°C temperature. Ninety days after nematodes inoculated plants, were washed to free of soil with water. Observation on shoot length, fresh shoot weight, rootlength, fresh root weight number of pods, rhizobium nodulation and numbers of root-knot, final population of larvae/pot were recorded. Finally, data weretabulated and subjected to statistical analysis using appropriate statistical procedures.

Effect of different inoculums level of *M. incognita* on growth parameters and nematode population of soybean. With the increasing inoculum level of *M. incognita* there was a progressive deceases in all plant growth characters of soybean from 500 to 2000 larvae per pot (Table-1). The plant became stunted with increase of inoculum dinsity of nematode population. It as been observed that there was a significant reduction in plant height at and above 1500 nematodes. The plants showed chlorosis, rugose in leaves and shedding of a few basal leaves at highest inoculum level. Similar symptoms were observed on chili by (6).

There was a significant reduce in shoot length and weight (fresh) of the plants with 500 to 2000 larvae per pot (Table-1). Similar findings has been reported by (7) on soybean and *Vigna radiata* respectively.

Like root length and fresh root weight also decreased with increase in nematode inoculums form 500 to 2000 larvae though the significant reduction in root length and root weight was obtained with an inoculums level of 1500 larvae per pot. On Jute

Table-1: Effect of different inoculums levels of *M. incognita* on growth parameters and nematode population of soybean.

Initial inoculum level	90 DAS							
	Shoot length (cm)	Fresh shoot weight (g)	Root length (cm)	Fresh root weight (g)	Number of Pods/ plant	Number of nodules / plant	Number of Galls/plant	Final nematode population (Soil +root)
0	71.16	82.4	14.63	3.30	41.2	15.5	0	0
500 J_2 larvae	60.6	77.11	13.33	2.90	35.13	9.56	23.36	1324.33
1000 J_2 larvae	53.2	62.88	12.33	2.26	30.16	6.96	65.16	1900.00
1500 J_2 larvae	50.83	56.22	11.86	1.23	26.4	4.90	116.86	2306.66
2000 J_2 larvae	44.16	51.93	10.63	0.66	20.6	4.23	150.53	2791.66
F–test	s	s	s	s	s	s	s	s
S.Ed. (±)	3.80	1.39	0.46	0.12	0.54	0.68	3.28	38.45
C.D. (5%)	8.76	3.22	1.06	0.29	1.26	1.57	7.57	88.66

However, reported increased root length and weight at low level of inoculums densities (500 to 1000 larvae per pot) over control. This may be due to the fact that in the present investigation, the weight of galls was not sufficient to compensate for the reduction in root system of soybean even at low level of inoculums. The number of pods and nodules also increased in low inoculums level from 500 to 1000 larvae per pot. The number of galls increased gradually with increasing level of inoculum up to 2000 larvae per pot. As against this, there was a gradual increase in nematode population in pot soil with the increase of inoculum even up to 2000 level.

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