INCIDENCE OF ROOT-KNOT NEMATODE IN MELOIDOGYNE INCOGNITA ON TOMATO IN RANGAREDDY DISTRICT.

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Abstract: Survey conducted in Harshaguda village Maheshwaram Mandal Ranga Reddy district during Kharif season 2017-2018 revealed incidence of root knot nematode *meloidogyne incognita* on tomato where infestation was found to an extant of 25%.Infestation was observed in low lying area of the field where there was ran off soil from upper side to lower side .The infested plants were showing external symptoms like stunned growth yellowing and sickly appearance of the plant. Observation of roots revealed that galling percentage from 10%- 60%, gall number ranged from 40-453, gall size ranged from small, medium and large. However the number of small galls indicating early stage of nematode infestation was more that clearly reveals further development of nematode infestation during the crop period which ultimately infest the tomato yield.

Introduction: Successful raising of vegetable crops is hampered by the attack of plant parasitic nematodes, Root-knot nematodes, *Meloidogyne spp*, one of the third major economically damaging genera of plant parasitic nematodes on horticulture crops especially solanaceous vegetables. The annual estimated crop loss due to major plant parasitic nematodes in India has been worked out to be 242.1billion(Jain *et al* 2007). Root-knot nematodes are distributed worldwide and are obligate parasites of the roots of thousands plant species, more than 3000 plant species are infested by root-knot nematodes(Hussey and Janssen,2002). In India , yield losses in tomato due to *M.incognita* range from 40-46% (Bhatti and Jain, 1997and Reddy 1995).

Among various crops vegetables are worst affected , hardly any vegetable crop escape infestation by this nematode particularly in tropical areas like Ranga Reddy District. Root-knot disease is caused by various species of *Meloidogyne*. There are several species of root-knot nematodes found in India including

- *M.incognita*
- *M.Javanica*
- *M.arenaria*
- *M.hapla*

Root-knot nematode damage results in poor growth, wilting of the plants, a decline in quality and yield of the crop and reduced resistance to other stresses like diseases. A high level of damage can lead to total crop loss. Nematode damaged roots, don't use water or fertilisers as effectively, leading to additional losses for the grower. Root-knot nematodes have great impact on crop productivity of Tomato, when they attack the roots of siblings immediately after seed germination as well as standing crop in the field.

However no work has been reported on the *Meloidogyne* species of plant parasitic nematodes in Harshaguda village, Maheshwaram mandal, RangaReddy District .

Hence this work on the identification of root-knot nematode, Meloidogyne species may be considered to be the first recorded documentation

Tomato is a major vegetable crop that has achieved tremendous popularity over a last centurary.Tomatoes being a good source of vitamin 'A' and vitamin 'C'.These vitamin are important for bone growth, cell division and differentiation, for helping in the regulations of immune system and maintaining surface living of eyes, respiration, urinary and intestinal tracts. It is important for forming collagen, a protein that gives structures to bone cartilage, muscle and blood vessels. It also helps to maintain capillaries, bones, teeth and aids in the absorption of iron. Lycopene is very powerful antioxidant which can help in preventing the development of many forms of cancer .Cooked tomatoes and tomato products are the best source of lycopene since lycopene is released from the tomato when cooked. Raw or cooked tomatoes are considered the best source of this antioxidant.

***Material and Methods**:*

Sample Collection: Survey was carried out to find out tomato field, infested with root knot nematode: Samples were randomly collected from different parts of the field. (i.e from four corners and center of the field. Seedlings were collected when they were of a four weeks age. All the samples collected were washed under clean running water to remove soil debris and stored at about 4°C for nematode extraction. In the laboratory , root samples were examined for over all root structure i.e the number of galls, galling percentage and size of the galls following the infection. To count the number of galls present on root surface , roots were washed in clean running water for 10 mints and data was recorded.

Gall Index Were Rated Based On 0-5 Scale as Per Taylor and Sasser (1978)

Galling %	Galling number	Gall size
1-20 ----- 1	0-90 ----1	Small --- 1
21-40 ---- 2	91 -180 ---2	
41-60-----3	181-270----3	Medium –2
61-80----4	271-360----4	
81-100----5	>361------5	Large---3

Extraction and Identification of Nematode Species: Extraction method is towards isolating all stages of nematode development by using Bearmann funnel extraction method as described by Bearmann. Identification of the nematode species was done by observing perennial pattern of the female nematode (*eisenback et al.,1981*). Mature females were dissected out from large galls of infected roots of tomato , perennial pattern was prepared and examined under the microscope which revealed the incidence of meloidogyne incognita. The nematodes in the roots were stained by cotton blue in lactophenol.

Occurrence of root knot nematode on Tomato in Harshaguda village, Ranga Reddy District:

Specimen	Galling %	Gall Size			Total Gall Number	Gall Index	
		Small	Medium	Large		Galling%	Gall Size
R1	60	370	68	15	453	5	3
R2	25	190	30	3	223	3	2
R3	20	63	7	0.0	70	1	1
R4	10	50	0.0	0.0	50	1	1
R5	20	96	0.0	0.0	96	2	1
average	27	154	21	1.26	98.4		

Results and Discussion: Present research revealed the incidence of infestation of root knot nematode on tomato. Five roots which were uprooted from four corners and center of the field .R1(root which was up rooted from low lying area), had highest infestation than other roots where the percentage of infestation was more in low lying area compared to other areas. This might be due to the run off soil from upper side to lower side of the field. As revealed in this study, it is important to note

that the number of small galls is more than the medium and large, indicating early stages of nematode infestation. This clearly reveals further deposit of nematode infestation during the growth period of crop, which could ultimately affects the tomato yield as well caution us for monitoring of the nematode infestation at regular intervals, so that timely management can be planned.

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