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ORIGINAL ARTICLE

Studies on the Comparative Susceptibility of Different Vegetable Crops Against Root-Knot Nematodes (*Meloidogyne spp.*)

Manendra Kumar

Department of Zoology, B.R.A. Bihar University, Muzaffarpur-842001, Bihar, India

Email: [mkumar8011@gmail.com](mailto:mkumar8011@gmail.com)

ABSTRACT

India is the second largest (next to China) producer of vegetables in the world. Bihar is one of the largest producer of fruits and vegetables in the country. The total area is vegetable cultivation in Bihar is about 5.00 lakhs ha. with annual production of about 7.6 million tones vegetables. During recent years, the root-knot nematodes (*Meloidogyne spp*) have become a cosmopolitan pest of economic crop plants. Their larvae infest plant roots, causing development of root-knot galls that drain the plant's nutrients. During present investigation, the comparative susceptibility of certain vegetable crops such as Tomato, Brinjal, Okra, Cucumber, Bean, Chillie and Radish against root-knot nematodes was studied in Bihar and found that Tamoto, Brinjal, Okra and Cucumber were highly susceptible to root-knot nematodes.

**Keywords:** Root-knot nematodes, *Meloidogyne*, Vegetable crops

Received 29.09.2019

Revised 21.10.2019

Accepted 11.11.2019

**How to cite this article:**

Manendra Kumar. Studies on The Comparative Susceptibility of Different Vegetable Crops Against Root-Knot Nematodes (*Meloidogyne spp.*). Adv. Biores., Vol 10 [6] November 2019. 162-164.

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INTRODUCTION

India is the second largest (next to China) producer of Vegetables in the world. According to a report of Agriculture ministry, Govt. of India, during 2017-18, horticulture production stood at record 311.7 MT, which is 3.7 percent higher than the previous year and 10 percent higher than the past five years average production. The area under coverage rose to 25.87 million hectares from 25.43 million hectares. According to the report, the production of fruits is estimated at 97.35 MT, while that of Vegetables of about 187.5 MT. Bihar is one of the largest producer of fruits and vegetables in the country. The total area under vegetable cultivation in Bihar is about 5.00 lakh ha with annual production of about 7.6 million tones [3]. The important vegetable crops include Potato, Tomato, Brinjal, Okra, Cucumber, Onion, Cauli flower, Radish, Chillies etc. The root-knot nematodes (*Meloidogyne spp*) are plant parasitic nematodes. They exist in soil in areas with hot climates or short winters Their larvae infest plant roots, causing development of root-knot galls that drain the plant's nutrients. Kumar [2] reported that tomato, okra and brinjal were highly susceptible to the attack of root-knot nematodes (*Meloidogyne spp*) in Bihar. During present investigation, comparative susceptibility of important vegetables crops such as Tomato, Brinjal, Okra, Cucumber, Bean, Radish and Chillies against root-knot nematodes (*Meloidogyne spp*) was studied at Muzaffarpur (Bihar) during 2018-19.

MATERIAL AND METHODS

For studying the comparative susceptibility of different vegetable crops against the incidence of root-knot nematodes, a pot trial was conducted during 2018-19. Twenty one pots (9" in diameter) were filled with autoclaved soil. Two-week old seedling of tomato, brinjal, okra, cucumber, bean, chillies and radish raised on sterilized soil were planted in the pots. Only two plants were planted in each pot. The trial thus comprised of seven treatments and each treatment was replicated thrice. Each plant was inoculated with nematode's larvae isolated from stock culture. After a period of 40 days, the plants were carefully up rooted and washed. The number of root galls per plant was counted. The average number of root galls/gm of root weight was also calculated.

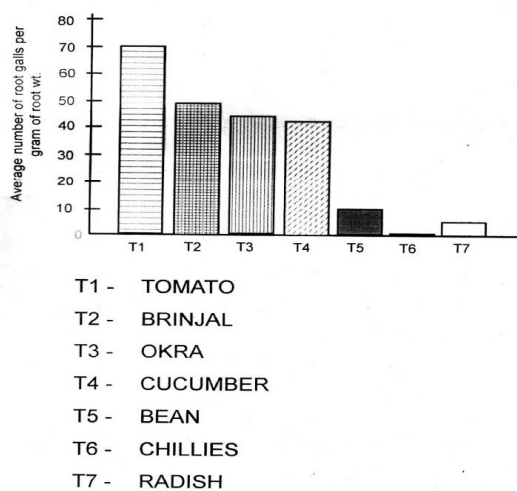
**RESULTS AND DISCUSSION**

After 40 days of inoculation, plants were carefully uprooted, washed and galls were counted per plant and the average number of root galls/gm of root weight was also calculated. Results are summarized in Table-1 and graphically represented in figure-1. From the data of the table, this is evident that all the host plants, except chillies were susceptible to root-knot nematodes. Tomato, Brinjal, okra and cucumber were highly susceptible. On the basis of the result, this is clear that tomato (*Lycopersicum esculentum*) showed the highest (70.00/gm of root wt.) infestation. The intensity of susceptibility has been expressed in terms of descending order: Tomato > Brinjal > okra > cucumber > Bean > Radish. As per nematological records from Bihar, Lall & Das [4], Sen [6] and Siddiqui, Prasad & Ansari [7] reported two species of root-knot nematodes (*Meloidogyne incognita* and *M. Javanica*) from different localities. According to Kumar [2], three species of *Meloidogyne* were found to be involved in infestation in Bihar *M. Javanica*, *M. Incognita* and *M. arenari*. He also reported that *M. Javanica* was found to be most common. Jensen [1] reported that all vegetables were hosts of root-knot nematodes. Kumar *et. al.* [3] reported that *Meloidogyne spp.* caused root-gall diseases and commonly known as root-gall nematodes. They reproduced that among vegetable crops sampled, okra gave the highest (92.68) frequency of infestation followed by tomato (82.53%) and garden egg (78.94%)

**Table-1: Comparative susceptibility of different Vegetable crops against root-knot nematodes (*Meloidogyne spp*)**

Host Plant	Treatments	Number of galls per gm. of root wt.			Average number of root galls per gram of root wt.
		Replications			
		1	2	3	
Tomato ( <i>Lycopersicum esculentum</i> )	T1	79.25	60.35	70.40	70.00
Brinjal ( <i>Solanum melongena</i> )	T2	47.10	44.47	56.43	49.33
Okra ( <i>Abelmoschus esculentus</i> )	T3	58.31	31.51	40.18	43.33
Cucumber ( <i>Cucumis sativus</i> )	T4	55.33	29.43	39.24	41.33
Bean ( <i>Dolichos lablab</i> )	T5	7.12	10.71	12.17	10.00
Chillies ( <i>Capsicum annum</i> )	T6	-----	-----	-----	0.00
Radish ( <i>Raphanus sativus</i> )	T7	4.92	3.02	4.06	4.00

**Figure- 1: Comparative susceptibility of different vegetable crops against root-knot nematodes (*Meloidogyne spp.*)**



**ACKNOWLEDGEMENT**

The author is thankful to University Grants Commission for sanctioning research project on "Root-knot Nematodes of Vegetables."

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