



## EVALUATION OF BRINJAL (*Solanum melongena*) VARIETIES FOR RESISTANCE TO ROOT-KNOT NEMATODE *Meloidogyne incognita*

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### ABSTRACT

The reaction of sixteen brinjal varieties to root-knot nematode *Meloidogyne incognita* was studied under artificially inoculated pot condition. Two brinjal varieties Vijay and Annamalai were found to be resistant, four varieties Syamala, BR-112, Azad Hybrid and Rajendra exhibited moderately resistant, 2 varieties No.81 and VNR-125 were found to be moderately susceptible, Pusa purple long was found highly susceptible and the remaining varieties viz. Azad kranti, Green Round, Aruna, NS-317, Navkiran No.23, Sakura-371 and VNR-60 were rated as susceptible for *M. incognita*.

**KEY WORDS:** Brinjal varieties, *M. incognita*, Resistant, Susceptible

### INTRODUCTION

Brinjal (*Solanum melongena*) is an important vegetable crop grown in almost all part of India. The root-knot nematodes, *Meloidogyne spp.* Are worldwide in distribution and damage caused them is higher in tropical and subtropical countries, *M. incognita* has been reported to be the most important nematode pest in India, Bangladesh, Brazil, Egypt, Hawaii, Nepal and Pakistan<sup>1</sup>. according to Nane *et al.*, (1989) Plant parasitic nematodes cause 12.3% yield loss of world's major crops per annum which is worth \$ 77 billion, serious yield losses in brinjal and other Solanaceae vegetable crop due to Root-knot nematodes<sup>2-4</sup>. (Darker and Mhase, 1988; Khan and Khan 1990, 1996). Root-Knot nematode *Meloidogyne incognita* was ranked first in India due to its deleterious effect on economically important crop plants<sup>5</sup>. (Sharma *et al.*, 2002). Brinjal is attacked by root-knot nematode *M. incognita* causing gall on the root which hampers the uptake of major and minor nutrients from soil. Use of resistant cultivars is the best method for the plant disease control. An economical and eco-friendly approach to manage these plant parasitic nematodes under field condition. Various researchers have reported the management of root-knot nematode on brinjal and other vegetable crop by many workers<sup>6-8</sup>. (Parvatha Reddy *et al.* 1986; Sharma *et al.*, 2005; Rai *et al.*, 2010). Therefore, there is a need to search a better alternative for management the disease. The present study was undertaken to screen brinjal varieties for their reaction to *M. incognita*.

### MATERIALS & METHODS

The brinjal varieties viz. Azad kranti, Syamala, Green Round, Aruna, BR-112, Vijay, Azad Hybrid, No.81, Rajendra, NS-317, Annamalai, Navkiran No.23, Pusa purple long, VNR-125, Sakura-371 and VNR-60 to be screened against *M. incognita*. Sterilized seed of different varieties sown in plot. Germinated plants were transferred into earthen pots containing one Kg. sterilized soil. After

five days freshly hatched J2 larvae inoculated into pots @ 1000 nematode juveniles per plant in the root zone. Uninoculated seedling served as control. Each treatment was replicated thrice. The experiment was terminated after 60 days of inoculation. Data on average number of galls per plant, average number of egg masses per plant, Root-knot index (R.K.I) and resistant rating. Root-knot index (R.K.I) - The method adopted by Sasser *et al.*<sup>9</sup> (1984) was slightly modified and used in the present investigation.

### Basic of Resistance Rating

0/no gall, Immune(0), 1-15 gall Resistant(1), 16-25 gall Moderately resistant (2), 26-50gall Moderately susceptible (3), 51-100 gall susceptible heavy galling (4), 100+ or more gall Highly susceptible (5)

### RESULTS & DISCUSSION

Results presented in Table 1 reveal that brinjal varieties exhibited differential reaction inst root-knot nematode *M. incognita*. brinjal varieties showed significant differences among themselves. Data recorded in the present study showed that of the 16 varieties. Non variety found immune against root-knot nematode. It was found that during screening under pot, variety Vijay and Annamalai were resistant. The root-knot index of the variety was 0.7 and 0.8. Average number of the gall per plant was noted 10.33 and 12.66. Four varieties Syamala, BR-112, Azad Hybrid, Rajendra exhibited moderately resistant. The root-knot nematode of the above mentioned varieties was 1.44, 1.57, 1.42 and 1.51. Average numbers of galls per plant were recorded 21.66, 23.66, 21.33 and 22.66 and average numbers of egg masses per plant were 9, 8.3, 9 and 9 respectively. Two varieties No.81, VNR-125 were found to be moderately susceptible having root gall index 2.86 to 3.01 and average number of gall per plant was noted 40.66, 43.33. Average numbers of egg masses per plant were 20 and 18 respectively. Seven varieties viz. Azad kranti, Green Round, Aruna, NS-317, Navkiran No.23, Sakura-371 and VNR-60 were observed to be susceptible showing root-knot index as 3.4, 3.45, 3.8, 3.43, 3.3, 3.26, and 3.01 and average number of gall per plant 71.65,

70.33, 92.33, 71.66, 65, 63.33, and 50.66 were recorded respectively. Average numbers of egg masses per plant were 33, 10.66, 38.6, 28.35, 24, 26.66 and 34.33 respectively. One variety Pusa purple long was recorded highly susceptible having root gall index 5.0. It shows 97.66 average numbers of gall per plant and 49.33 egg masses per plant. Six varieties which showed resistant and moderately resistant to root-knot nematode having root gall index between 0.1 to 2.0 under pot trial. Vijay and Annamalai showed resistant. It was also observed that among the remaining 10 varieties were moderately susceptible, susceptible and highly susceptible to root-knot nematode with root gall index between 2.1 to 5.0. Pusa Purple long was reported as slightly susceptible against *M. incognita* Haider *et al.*<sup>10</sup>. 2001, Jain *et al.*<sup>11</sup> (1983)

discussed as slightly resistant to *M. javanica*. Syamala was found moderately resistant by Harinath Naidu *et al.*<sup>12</sup> (2006). Vijay and Annamalai reported as resistant by many workers<sup>10,13</sup> (Haider *et al.*, 2001; Nandwana *et al.*, 1980) but discussed as susceptible by many workers<sup>6,14</sup> Sharma *et al.*, 1988; Parvatha Reddy *et al.*, 1986). Some variation might be because of different race of nematode soil type and other environmental condition. It is presumed that the resistance to root-knot nematode on brinjal may be genetically and host does not provide proper nourishment to nematode or release some sort of toxin which may adversely affect the nematode activity. Resistant variety Vijay, Annamalai, Syamala, BR-112 Rajendra and Azad Hybrid will be proved useful for parents for root-knot nematode resistant breeding programmed.

**TABLE 1:** Incidence of *Meloidogyne incognita* in different Varieties of Brinjal in pots (Observations are mean of three replicates)

S. No.	Name of Varieties	Average No. of Gall/Plant	Average No. of Egg Masses/Plant	Root-Knot Index (R.K.I.)	Resistance Rating
1	Azad Kranti	71.66	33	3.4	S
2	Syamala	21.66	9	1.44	M.R.
3	Green Round	70.33	10.66	3.45	S
4	Aruna	92.33	38.6	3.8	S
5	BR-112	23.66	8.33	1.57	M.R.
6	Vijay	10.33	4.3	0.7	R
7	Azad hybrid	21.33	9	1.42	M.R.
8	No. 81	46.66	20	2.86	M.S.
9	Rajendra	22.66	9	1.51	M.R.
10	NS-317	71.66	28.35	3.43	S
11	Annamalai	12.66	6	0.8	R
12	Navkiran No. 23	65	24	3.3	S
13	Pusa Purple Long	97.66	49.33	5	H.S.
14	VNR-125	43.33	18	2.73	M.S.
15	Sakura-371	63.33	26.66	3.26	S
16	VNR-60	50.66	34.33	3.01	S

1. 0- Immune (0), 2. 1-15 – Resistant (R) (1), 3. 16-50 Moderately Resistant (M.R.) (2), 4. 26-50 moderately susceptible (M.S.) (3), 5. 51-100 – Susceptible (S) (4), 6. 100+ Highly Susceptible (H.S) – (5)

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