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Reaction of mungbean cultivars against root-knot nematode, *Meloidogyne incognita*

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Abstract
Sixty five mungbean cultivars were screened under poly house condition for resistance against *M. incognita* infecting mungbean. Cultivars, De local and T-43-1-5 were highly resistant; OBGG-52(Durga) and OBGG-194 were resistant and cultivars, KM-2293, AKM-10-13, DGG-1, ML-1628, AKM-8802, PDM-288, IPM-02-16, PDM-87, IPM-306-6, OBGG-170, RCM-4, RCM-5, RCM-2 were moderately resistant to *M. incognita*. Rest other cultivars were susceptible to highly susceptible.

Keywords: *Meloidogyne incognita*, mungbean, resistance

Introduction
Root-knot nematode, *Meloidogyne incognita* is considered as one of the major limiting factor in the sustainable mungbean production. This important plant parasitic nematode has been reported to cause appreciable loss in yield by disturbing homeostasis, forming galls on the roots and interfering with biological nitrogen fixation. The management of this nematode through chemical nematicides is costly and most of the nematicides are vanishing from the world market because of environmental pollution. Therefore, it was felt necessary to exploit the available germplasms of mungbean for their resistance against this nematode species so that effective management can be achieved without the burden of additional cost to the growers.

Materials and Methods
A replicated pot culture experiment was conducted in 15 cm diameter earthen pots, each containing 1 kg stem sterilized soil. Sixty five mungbean cultivars were sown in pots and one week after germination, 1000 freshly hatched second stage juveniles of *M. incognita* were inoculated to each pot. Pots along with the plants were watered regularly. Forty five days after inoculation plants were uprooted, washed carefully and root knot indices were recorded in 1-5 scale (Adegbite *et al*., 2011) [1] on the basis of root galls and egg masses in Table- 1. The reaction of cultivars in the 1-5 scale is reported in Table-2. Data were analyzed in CRD for comparison among different treatment means.

Table 1: Root gall index (1-5 scale)

Sl. No	Infection	Number of galls	Reaction
1.	No infection	No galls, no egg mass	Highly resistant (HR)
2.	Very high infection	0-10 galls with egg mass	Resistant (R)
3.	Light infection	11-30 galls with egg mass	Moderately resistant (MR)
4.	Moderate infection	31-50 galls with egg mass	Susceptible (S)
5.	Heavy infection	More than 50 galls with egg mass	Highly susceptible (HS)

Results and Discussion
The results of the present investigation indicated varying degree of reaction of cultivars to *M.incognita*. Out of sixty five entries 22 entries *viz*; PM-09-11,ML-818,WGG-979, PUSA-1271, PUSA-0672, NDMK-10-35, BM-4, RVSM-11-9, IVTUNNATI, PUSA-RATNA, IPM-2K-14-5, ML-5, IPM-2K-14-9, PANT-MUNG-5, RCM-12, PKUM 8802, PDM 84-143, PS-16, OBGG-182, PANT M 4, OBGG-176, OBGG 180 exhibited highly susceptible reaction

with a mean root knot index ranging between 4.66 to 5. Twenty six cultivars *viz*; ML-1666, DGG-5-L, AKM-09-02, GM-04-02, PKV-AKM-4, VGG-04-011, IPM-306-6, RMG-1004, MH2-15, IPM-02-3, IPM-2K-15-4, IPM-02-14, MH-805, TMB-36, PUSA-1171, IPM-02-01, IPM-02-23, PDM-871, PDM 96-126, RCM-8, PDM 84-249, RCM-6, PDM-54, LGG 407, K-85-1, OBGG-173 exhibited root knot index between 4 to 4.33 and hence were rated as susceptible ones. Devi *et al*, 2014tested 28 germ plasms of mungbean against *M. incognita*, race-2 in which 24 were susceptible and four were highly susceptible similar to the present study. Thirteen cultivars KM-2293, AKM-10-13, DGG-1, ML-1628, AKM-8802, PDM-288, IPM-02-16, PDM-87, IPM-306-6, OBGG-170, RCM-4, RCM-5 and RCM-2 were rated as moderately resistant. Gupta *et al*, 1986 [3] screened 219 varieties of mungbean for their susceptibility to root knot nematode, *M. javanica* and have reported 15 varieties with moderate resistant reaction similar to the present study.

Table 2: Reaction of Mungbean cultivars against *M. incognita*.

SL. No	Cultivars	Mean root knot index	Reaction
1	ML-1666	4.33	S
2	PM-09-11	4.66	HS
3	DGG-5-L	4	S
4	ML-818	5	HS
5	KM-2293	3	MR
6	AKM-09-02	4	S
7	GM-04-02	4	S
8	PKV-AKM-4	4	S
9	AKM-10-13	3	MR
10	VGG-04-011	4	S
11	WGG-979	5	HS
12	IPM-306-6	4	S
13	PUSA-1271	5	HS
14	RMG-1004	4	S
15	MH2-15	4	S
16	IPM-02-3	4	S
17	PUSA-0672	5	HS
18	NDMK-10-35	4.66	HS
19	DGG-1	3	MR
20	IPM-2K-15-4	4	S
21	ML-1628	3	MR
22	BM-4	5	HS
23	IPM-02-14	4	S
24	RVSM-11-9	5	HS
25	AKM-8802	3	MR
26	IVTUNNATI	5	HS
27	MH-805	4	S
28	TMB-36	4	S
29	PUSA-1171	4	S
30	PUSA-RATNA	5	HS
31	IPM-02-01	4	S
32	IPM-02-23	4	S
33	IPM-2K-14-5	5	HS
34	ML-5	5	HS
35	PDM-288	3	MR
36	IPM-02-16	3	MR
37	PDM-87	3	MR
38	PDM-871	4	S
39	IPM-306-6	3	MR
40	IPM-2K-14-9	5	HS
41	PANT-MUNG-5	5	HS
42	OBGG-170	3	MR
43	RCM-12	5	HS
44	PDM 96-126	4	S
45	RCM-4	3	MR
46	RCM-8	4	S
47	PDM 84-249	4	S
48	PKUM 8802	5	HS
49	DE LOKAL	1	R
50	PDM 84-143	5	HS
51	T43-1-5	1.33	HR
52	OBGG-194	1.66	R
53	RCM-5	3	MR
54	PS-16	5	HS
55	RCM-6	4	S
56	RCM-2	3	MR

57	PDM-54	4	S
58	OBGG-182	5	HS
59	LGG 407	4	S
60	K-85-1	4	S
61	PANT M 4	5	HS
62	OBGG-173	4	S
63	OBGG-176	5	HS
64	OBGG 180	5	HS
65	OBGG 52	2	R

*S-Susceptible *HS-Highly susceptible *MR-Moderately Resistant *R-Resistant *HR-Highly resistant

Two cultivars OBGG52 (Durga) and OBGG-194 exhibited resistance reaction with mean root knot index of 2.00 and 1.66 respectively. The result of present investigation is in confirmity with the findings of Mishra and Swain, 1988 [4] in which they have screened nine mutants lines of mungbean resistant to *M. incognita*.

Two cultivars, De-Local and T-43-1-5 exhibited highly resistance reaction with root-knot index ranging between 1-1.33. The result of the present investigation is in congruence with the findings of Gupta *et al.,* 1986 [3] and Mishra and Swain, 1988 [4]. However, the cultivars used in the present study were altogether different from the cultivars used by the above workers

References

1. Adegbite AA, Amusa NA, Agbaje GO, Taiwo LB. Screening of cowpea varieties for resistance to *Meloidogyne incognita* under field conditions. *Nematropica*. 2005; 35(2):155-158
2. Devi G, Choudhury BN, Bhagawati B**.** Screening of mungbean variety/ germplasm against root-knot nematode (*Meloidogyne incognita*) Race-2. Indian Journal of Nematology. 2014; 44(2):253-255
3. Gupta DC, ParuthiI J, Verma KK. Reaction of mungbean germplasms and its pathogenicity against *Meloldogyne javanica*. Indian Journal of Nematology, 1986; 16(2):194-196.
4. Mishra SK, Swain PK. Reaction of some mungbean lines to root knot nematode, Meloidogyne incognita. Indian Journal of Nematology. 1988; 18(2):348-349.