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Management of root knot nematode (*Meloidogyne incognita*) in brinjal crop using various formulations of *Parthenium hystereophours* in micro-plot condition

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Abstract
Role of *Parthenium hystereophours* on population built-up of *Meloidogyne incognita* on brinjal was studied. The observations recorded revealed that, number of galls soil population, egg population, total root population, total nematode population and multiplication factor of nematode was significantly lower in all the treatment in comparison to treated check. The highest soil population, egg population, total root population, total nematode population, multiplication factor and number of galls was recorded (1938.5), (577.50), (183.75), (78045.25), (15.60) and (173.50) respectively in untreated check with the minimum (536.70), (93.60), (36.25), (9932.75), (1.98) and (25.75) in treated check respectively. Among the *Parthenium* and compost treatments the most effective treatment for the management of root knot nematode *Meloidogyne incognita was Parthenium* leaf compost @ 7.5% + compost. It was followed by *Parthenium* leaf compost @ 5% + compost, *Parthenium* leaf compost @ 7.5%, *Parthenium* leaf compost @ 5% + compost, *Parthenium* leaf compost @ 5%, *Parthenium* compost @ 5% and compost @ recommended dose in ascending order for the management of root-knot nematode, *Meloidogyne incognita*. highest multiplication rate 15.60 in untreated check, 11.58, 9.70, 8.86, 8.18, 7.44, 5.95 and 3.98 with the minimum (1.98) in compost @ the recommended dose, *Parthenium* compost @ 5%, *Parthenium* leaf compost @ 5%, *Parthenium* compost @ 5% + compost, *Parthenium* leaf compost @7.5%, *Parthenium* leaf compost @ 5% + compost, *Parthenium* leaf compost @ 7.5% + compost and treated check respectively.

Keywords: compost, gall, *Meloidogyne*, nematode, *Patheenium*, root knot

Introduction
Root-knot nematode, *Meloidogyne* spp. Goeldi; 1892 by various Nematologists have been reported as one of the important noxious nematode problem causing enormous yield losses. Ranges from 28.3 to 47.5 in tomato, 26.5 to 50.0 in brinjal, 19.7 to 33.3 in chilli and 60 to 90 per cent in bitter gourd under Indian condition. The recorded economically important species of genus, *Meloidogyne* are *M. incognita*, *M. javanica*, *M. arenaria* and *M. hapla* are known to be associated with vegetables, fruits, spices, condiments, pulses and cereal crops but the disease severity always remain high in most of the above said crops except to that of cereal crops. Among various approaches known so far the management of plant parasitic nematode below economic injury level, cultural practices are not generally advised to follow because of time limit, economic pressure on land and other inherent difficulties (Jatala 1985) [11]. Likewise nematicides are also not being used primarily due to their unfavorable cost benefit ratio and their non availability. Although quick results can be obtained with the application of nematicides, even then they are not over whelmed because of their residual effect on human health and ground water contamination. The growing awareness regarding the use of various nematicides for the management of plant parasitic nematodes have further accentuated the problem and emphasized the need to address the problem by exploring other eco-friendly options. Keeping in view the above facts and for keeping the use of nematicides to the bare minimum one, such an emerging situation have made the scientist to review the strategies of nematode management by incorporating other possible ecologically safe control measures like exploitation of the allelopathic properties of certain wild weeds.

Materials and Methods
In order to study the role of *Parthenium hystereophours* in management of *Meloidogyne incognita* on brinjal a total of nine treatments i.e. *Parthenium* leaf compost @ 7.5% (T1),

Parthenium leaf compost @ 5.0% (T2) *Parthenium* compost 5.0% (T3), *Parthenium* leaf compost @ 7.5% + FYM @ recommended doses (T4), *Parthenium* leaf compost @ 5.0% +FYM @ recommended doses (T5), *Parthenium* compost @ 5% + FYM @ recommended doses (T6), FYM @ recommended doses (T7), Treated check (Carbofuran @ 1.5g / kg soil) (T8) and untreated check (T9), were prepared in sandy loam garden soil in 9 inch earthen pot. The each pot were planted with 3-4 leaf stage brinjal seedling inoculated with freshly hatched *Meloidogyne incognita* larvae was inoculated after three days of transplanting brinjal seedling and left for growth in cage house. All treatments were replicated six times. The experiment was run for a period of 30 days and the plants were uprooted and washed carefully for free of soil and processed for recording the observation on number gall/plant, soil population, root population, egg population and male population per plant.

Result and discussion

In order to study the role of *Parthenium hystereophours* on population built-up of *Meloidogyne incognita* on brinjal a total of nine treatments i.e. *Parthenium* leaf compost @ 7.5% (T1), *Parthenium* leaf compost @ 5.0% (T2) *Parthenium* compost 5.0% (T3), *Parthenium* leaf compost @ 7.5% + FYM @ recommended doses (T4), *Parthenium* leaf compost @ 5.0% +FYM @ recommended doses (T5), *Parthenium* compost @ 5% + FYM @ recommended doses (T6), FYM @ recommended doses (T7), Treated check (Carbofuran @ 1.5g / kg soil) (T8) and untreated check (T9), were prepared The experiment was run for a period of 30 days and the plants were uprooted and washed carefully and processed for recording the observation on number gall/plant, soil population, root population, egg population and male population per plant.

Observation presented (table 6) on number of galls/plant soil population, egg population, total root population, total nematode population and multiplication factor of nematode indicate that all the treatment were significantly different to each other and observed significantly lower galls/plant, soil, root and total population in treated and untreated check. The highest soil population, egg population, total root population, total nematode population, multiplication factor and number of galls was recorded (1938.5), (577.50), (183.75), (78045.25), (15.60) and (173.50) respectively in untreated check with the minimum (536.70), (93.60), (36.25), (9932.75), (1.98) and (25.75) in treated check respectively. Among the *Parthenium* and compost treatments the most effective treatment for the management of root knot nematode *Meloidogyne incognita was Parthenium* leaf compost @ 7.5% + compost. It was followed by *Parthenium* leaf compost @ 5% + compost, *Parthenium* leaf compost @ 7.5%, *Parthenium* leaf compost @ 5% + compost, *Parthenium* leaf compost @ 5%, *Parthenium* compost @ 5% and compost @ recommended dose in ascending order for the management of root-knot nematode, Meloidogyne incognita. The multiplication factor recorded in all the treatment showed highest multiplication rate 15.60 in untreated check, (11.58), (9.70), (8.86), (8.18), (7.44), (5.95) and (3.98) with the minimum (1.98) in compost @ the recommended dose, *Parthenium* compost @ 5%, *Parthenium* leaf ompost @ 5%, *Parthenium* compost @ 5% + compost, *Parthenium* leaf compost @7.5%, *Parthenium* leaf compost @ 5% + compost, *Parthenium* leaf compost @ 7.5% + compost and treated check respectively.

Table 1: Management of root-knot nematode *Meloidogyne incognita* using *Parthenium* on brinjal Observations are the mean of four replications

S. No.	Treatments	No of galls/ plant	Soil population/ Plant	Eggs/ Plant*	Total Root Population/ Plant	Total Nematode Population/Plant	Multiplication factor
1.	T_1	97.50	1310.25	35.75	85.75	37243.5	7.44
2	T_2	119.25	1575.50	42.50	151.50	44346.25	8.86
3.	T_3	129.50	1722.75	46.50	166.75	48519.00	9.70
4.	T_4	67.75	642.50	19.25	62.50	19905.00	3.98
5.	T_5	75.50	856.00	28.75	77.25	29758.75	5.95
6.	T_6	101.25	1435.75	39.25	119.25	40905.25	8.18
7.	T_7	147.75	1839.50	55.75	173.50	57910.75	11.58
8.	T_8	25.75	536.50	09.36	36.25	9932.75	1.98
9	T_9	173.50	1938.50	57.75	183.75	78045.25	15.60
CD Value at 5%		12.26	21.15	4.12	7.45		

T_1	*Parthenium* leaf compost@7. 5%	T_4	*Parthenium* leaf compost@7. 5% +FYM @ RD	T_7	FYM @ RD
T_2	*Parthenium* leaf compost@ 5%	T_5	*Parthenium* leaf compost@ 5% +FYM @ RD	T_8	Treated check
T_3	*Parthenium* compost@ 5%	T_6	*Parthenium* compost@ 5% +FYM @ RD	T_9	Untreated check

Conclusion

The observations recorded revealed that, number of galls soil population, egg population, total root population, total nematode population and multiplication factor of nematode was significantly lower in all the treatments in comparison to check. Among the *Parthenium* and compost treatments the most effective treatment for the management of root knot nematode *Meloidogyne incognita was Parthenium* leaf compost @ 7.5% + compost. It was followed by *Parthenium* leaf compost @ 5% + compost, *Parthenium* leaf compost @ 7.5%, *Parthenium* leaf compost @ 5% + compost, *Parthenium* leaf compost @ 5%, *Parthenium* compost @ 5% and compost @ recommended dose in ascending order for the management of root-knot nematode, *Meloidogyne incognita*.

References

1. Abo- Elyours, Kamal AM, El-morsi AM, Abdel Gaid MA. Management of tomato root knot nematode *Meloidogyne incognita* by plant extract and essential oils. Plant pathology JV 2009;25(2):189-192.
2. Alam MM, Khan AM, Saxena SK. Mechanism of control of plant parasitic nematodes as a result of the application of organic amendments to the soil. Indian. J Nematol 1979;9:136-142.
3. Alam MM, Khan AM, Saxena SK. Management of plant parasitic nematodes by different cropping sequence. Indian J Pl. Pathol 1988;6:102-109.
4. Achievement. AICRP on Nematode pest and their control 1977-87, 16-26.

5. Bora BC, Phukan PN. Organic amendments for the control of root-knot in jute. J Res. Assam Agric. Univ 1983;4:50-54.
6. Gommers FJ. Biochemical interactions between nematodes and plants and their relevance to control. Helminthol. Abstr. Sr. B. Plant Nematol 1981;50:9-24.
7. Gopinatha KV, Gowda DN, Nagesh M. Management of root-knot nematode, *Meloidgyne incognita* on tomato usiong bio-agent *Verticullum chlamydosporium*, neem cake, marigold and carbofuron. Indian J Nematol 2002;32(2):179-181.
8. Hacknmey RW, Dickerson OJ. Marigold castor bean and chrysanthemum as control of *Meloidogyne incognita* and *Pratylenchus alleni.* J Nematol 1975;7:84-90.
9. Haque SE, Sultana V, Abid M, Araj, Ghaffar A. Use of *Calotropics procera* and microbial antagonist in the control of *Meloidogyne* incognita on mung bean. Pakistan J Phytopath 1997;11:52-55.
10. Hasan A. Allelopathy in management of root-knot nematode In: Allelopathy: Basic and Applied Chapman and Hall London 2009, 413-441.
11. Jatala P. Biological control of nematodes. In An advanced treatise on *Meloidogyne*, (eds. J.N. Sasser and C.C. Caster), 1985; 1:303-308.
12. Kamal AM, Elyousr A, Awad MSM, Gaid MAA. Management of tomato root-knot nematode, *Meloidoygne incognita* by plant extract and essential oils. Plant Pathol J 2009;25(2):189-192.
13. Katooli N, Moghodam EM, Taheri A. Management of root-knot nematode (*Meloidogyne incognita*) on cucumber with the extract and oil of nematicidal plants. http//www.scialert.net/fulltext?doi=ijar2010. 582-583 & org=10 2010.
14. Pandey. RApplication of botanicals for management of root-knot nematode direare of *Ammi majus* L. Indian J Nematol 2002;32(2):198-200.
15. Patel HR, Patel DJ, Patel CC, Thakar NA. Management of root knot nematodes by periwinkle. Nematol Medit 1991;19:65-66.
16. Pathak KN, Keshari N. Management of root-knot disease of cauliflower by organic amendments and carbofuran. Indian J Nematol 2003;33(2):191-193.
17. Prasad D, Ram D, Imtiyaz A. Management of plant parasitic nematodes by the use of botanicals. Ann. Pl.t Prot. Scie 2002;10(2):360-367.
18. Ramakirshnon S, Senthilkumar T. Non chemical management of root- knot Nematode *Meloidogyne incognita* in Ashwagandha (*Withania, somnifera Dunal*). And senna (Cassia Anguistifolia vahli) Indian J Nematol 2009;V39(2):170-174.
19. Randhawa N, Sakhuja PK, Singh I. Management of root knot nematode *Meloidoggne incognita* in Abelmoschus *asculentus* through botanicals extraction and amendments. Indian J Nematol 2002;32(3):129-131.
20. Reddy PP, Khan RM, Rao MS, Chari MS, Ramaprasad G. Management of root-knot nematodes infesting papaya by incorporation of some plant leaves. In: Botanical pesticides in integrated pest management: Proceedings of National symposium held on January 21-22, 1990 at CTRI Rajahmurdry, 533105, India 1993, 421-423.
21. Saikia J. Aparajita Borah Bora, B.C. Efficacy of organic amendments in combination with the nematicide for management of *Meloidogyne incognita* in brinjal. Indian J Nematol 2007;37(2):179-181.
22. Saikia MK, Debanand Das. Integration of carbofuran with *Paecilomyces lilacinus* for the control of root-knot *nematode Meloidogyne* incognita on brinjal. Source Ann Biolo 2001;17(1):79-82.
23. Saxena R, Gangopadhyay A. Plant extracts and their role in management of juveniles of *Meloidogyne incognita.* Indian J Nematol 2009;35(2):142-144.
24. Siddiqui MA, Alam MM. Control of plant parasitic nematodes by intercropping with *Tagetes minuta* Nematol. Medit 2005-1987a;15:205-211.
25. Srivastava SS. Efficacy of organic amendments in the management of root-knot nematode (*Meloidoggne incognita*) infecting papaya. Indian J Nematol 2002;32(2):183-184.
26. Swathi P, Rao KT, Rao PA. Studies on control of root knot nematode *M. incognita* in tobacco nurseries. Tobacco Res 1998;24(1):26-30.
27. Thorne G. Control of Sugarbeet cyst nematode by crop rotation. USDA Farmers Bulletin 1926, 1514.
28. Upadhyay KD, Dwivedi K, Uttam SK. Role of plants parts and their extracts in the management of *Meloidogyne incognita* infecting pigeonpea. Indian J Nematol 2007;37(20):197-198.
29. Zarina B, Ghaffer A, Maqbool MA. Effect of plant extracts in the control of *Meloidogyne javanica* root-knot nematode on brinjal. Pakistan J Nematol 2003;21(1):31-35.