



Studies on Effectiveness of Nemahari Against Root Knot Nematode Disease *Meloidogyne incognita* of Mulberry to Reduction of Cocoon Yield Losses of Bivoltine Silkworm In Pune Region

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ABSTRACT

The Nemahari is an ecofriendly a plant based formulation for management of root knot disease and plant extracted products from *Azadirachta* species and utilize to soil application to prevent the root knot nematode severe infection of mulberry and does not harm the beneficial microflora in soil which is more effective to inhibits the multiplication of nematode galls and Root-knot disease of mulberry is caused by the nematode *Meloidogyne incognita*. It has important economic implications for sericulture. and found its infection with counting more than 50 galls per plant in pune region, of Maharashtra and its noticed caused by 8-10 percentage is losses the foliage production of mulberry which is affects to quality and quantum in cocoon production per unit area. objectives are attempts to prevent the multiplication of nematode and reduction of galls per plant the botanical nematicide or biopesticide was prepared as nemahari even make a study 16kg mix with 160 kg farm yard manure to apply this mixture in the trench along root zone area of plant in the depth 15 cm and covered with the soil and repeated after 70-80 days, in field of mulberry (*Morus* sp L.) is effectively. The mulberry infected with *Meloidogyne incognita* juveniles (J2). Pretreatment (ending 6 days before inoculation) and post-treatment (starting 6 days after inoculation) schedules were tested. The two uninoculated control batches were treated with the same procedure with nemahari Both pre- and post-treatment significantly reduced nematode infection in terms of root gall number and nematode population in roots of mulberry. All the

treated plants showed improved growth in terms of fresh biomass of shoot and root, length of shoot and root, num of leaves, leaf surface area, root and leaf-protein content. is more effective in all respects of nematode control as well as growth of the test plants. Pretreatments show slightly better effects than the post-treatments. It is interesting that inoculated and treated plants not only are less affected by nematodes but also have a better growth than uninoculated, untreated control. This biopesticide is more useful measure in control of nematode infection of mulberry

Keywords -

Mulberry, *Meloidogyne incognita*
Azadirachta,. Bivoltine silkworm

INTRODUCTION

Mulberry, the sole food source of silkworm *Bombyx mori* is prone to many diseases caused by fungi, bacteria, viruses, mycoplasma and nematodes. These microorganisms are the main obstacles causing considerable loss in yield and nutritive values of mulberry foliage (Chanturia, 1963; Shree et al., 1986; Shree and Umesh kumar, 1991). These diseases cause 10-30% leaf yield loss reducing the quality. Root knot disease caused by nematode *Meloidogyne incognita* is a serious one and causes 10-12% leaf yield loss. These nematodes are the major group of plant parasites and their world wide distribution, extensive host range and involvement in disease complexes with other pathogens make them a serious threat to the world's food supply (Sasser, 1989). Loss due to root knot nematodes in various crops is estimated to be around 11-25



%(Sasser1979).In mulberry these nematodes cause formation of galls/knots on the roots and stunted growth with reduced vigour of the plant (Saha et al., 1985). Mulberry being perennial plant when once nematode get established in the garden it is difficult to eradicate it. This root knot disease is more prevalent in sandy soils under irrigated farming systems and reduces the leaf production causing loss of revenue for mulberry growers (Sharma et al., 1998; Sharma and Sarkar1998). Any strategy for the management of nematodes depends on the crop life cycle, total life span and cropping pattern. The main aim of the disease management is to reduce the pathogen population to tolerable level. This is achieved by a variety of techniques or a judicious combination of physical, biological, host resistance and chemical control methods. As mulberry is perennial crop and nematode *Meloidogyne incognita* is endoparasitic in nature once it gets established in the garden it is difficult to eradicate. Hence the disease is to ecofriendly management techniques which involves different cultural, and biological methods. In the present study realising the need of proper management of root knot nematode an integration of organic amendments like neem cake, nemahari was done to find out their efficacy on three mulberry varieties M5 and S36 and V1. These three mulberry for the study conducted for their degree of resistance/ tolerance by using Egg mass Index and Root Gall Index after inoculating them with nematode juveniles as suggested by Hadisoegenda and Sasser (1982). In this study these two varieties have shown different degree of resistance. So for the present study varieties showing different degrees of tolerance and also popular varieties were selected. II.

MATERIAL AND METHODS

For this study the experimental four months old saplings of three were planted with 60cm x 60cm spacing and wider (90x150) x60 cm After three months of plantation each plant was inoculated with 1000 nematode juveniles /plant. The treatment was given by mixing 16kg of nemahari + 160 kg FYM which is sufficient for 1000 plants and were applied in

three split doses /year. ecofriendly management of root knot nematode *Meloidogyne incognita* Chitwood. in mulberry (*Morus* spp and Sixty days after application number of root galls/plant, and number of egg masses/ g root weight were calculated and after the period of establishment, growth and yield parameters i.e. Total plant height, number of leaves/plant, weight of 100 leaves, leaf moisture percentage, leaf yield / ha/annum were calculated to find out the effect of nemahari and ecofriendly management by comparing infested with treated plots.

RESULTS AND DISCUSSION

In this study the following parameters were observed to know the effect of nemahari on the management of root knot nematode *Meloidogyne incognita* in three mulberry varieties. The various parameters are as follows: Nematode population Number of egg masses/gm root weight: In these observations the variety V1 has shown 36.70 number of egg masses/ g root weight in control and the number was only 5.00 in treated. 86.45% of reduction was recorded which is highly significant compared to control. The S36 variety has shown 47.66 number of egg masses in control against 7.40 in treated with a percentage of reduction of 84.47 in treated. In M5 the number of egg masses were 56.60 in control and treated 9.20 respectively with 83.63 percentage of treated. In all these observations it was found that V1 has shown significant percentage of reduction (86.45) of egg masses/ g root weight compared to other varieties. It is followed by S36 (84.47), M5 (83.63), . Among all variety Number of galls/plant: In these studies V1 has shown 135.80 number of galls /plant in control and 19.90 number of galls/plant in treated with a percentage of reduction of 85.30. In S36 variety the number of galls/plant in control was 166.36 and in treated 28.10. The percentage of reduction observed was 83.10. In M5 variety the number of galls/plant was 178.30 in control and 30.73 in treated. The percentage of reduction was 82.75. The minimum percentage of reduction was observed in M5 Variations between control and treated also highly significant. The results are in conformity with Singh et. al (1971) who reported reduction of nematode population and



increase in plant height and growth in tomato and okra. Jatala et al 1986 reported parasitization of *Meloidogyne incognita* by. The results are in conformity with Govindaiah (1994) who reported increased moisture percentage and yield when treated with neem cake. The results are also in conformity with Sharma (1999) who reported 23% increase in leaf yield when treated with *Verticillium chlamidosporium*. Sankarnarayana et al who reported improved plant growth in tomato raised on VAM. Asha John and Hebsy Bai (2004). Same results were observed in brinjal by Reddy et al (1993). Nematicidal activity of neem cake by secreting played the major role in reducing the nematode population and also the organic manurial value of nemahari contributing in increasing plant growth and leaf yield. The reason in increased plant growth and suppressed nematode population with nematodes for infection site in curbing the nematode entry and multiplication in the root. So in conclusion it may be stated that ecofriendly control is more effective in managing the root knot nematode *Meloidogyne incognita*.

INFESTATION OF *MELOIDOGYNE INCOGNITA* AND REDUCTION

Name of mulberry variety	Eggs masse / plant	No of galls/ plant
V1 (T)	5.00	19.90
(C)	36.70	135.8
(R)	86.45	85.30
S36 (T)	7.40	28.8
(C)	47.66	166.34
(R)	84.47	83.10
M 5 (T)	9.2	30.73
(C)	56.6	178.30
(R)	83.63	82.75

References

1. Asha John and Hebsy Bai (2004). Evaluation of VAM for management of root knot nematode in Brinjal. Indian Journal of Nematology.34 (1)22-25.
2. Chanturia, N.N.Labahua, L.V. (1963). Soobsch Akad. Nauk Gruz SSR.32 (1), 141- 148.
3. Govindaiah., Dandin, S.B., Giridhar, K. and Datta., R.K.(1994).Efficacy of different doses of neem oil cake on *Meloidogyne incognita* infecting mulberry. Sericologia, 34:717-721.
4. Hadisoegenda, W.W.and J.N.Sasser. (1982). Resistance of tomato, bean, southern pea and garden pea cultivars to root knot nematodes based on host susceptibility. Plant Dis.66:145-150.
5. Jatala,P.(1986).Biological control of plant parasitic nematodes.Ann.Rev. and control. Edited by Lamberti.F. and Taylor, C.E. Academic press.
6. Sharma,D.D.(1998).Ecofriendly approach for management of ootknot. IndianSilk, August,pp.15-16.
7. Shree,M.P.Boraiah,NarayanaGowda.S.N.(.1996).Nat.Sem.ProspProb.Sericulture, India, March 27-30, P 38.
8. Shree,M.P.,Umesh kumar, N.N.(1991). Sericologia, 31(3),441-444. [12]. Singh R.S., Sitaramaiah K.(1971) Control of root knot through organic and inorganic amendaments of soil, effect of oilcakes and saw dust. Indian.J.Mycol. and Plant pathology., 1, 20-29.