



(RESEARCH ARTICLE)



## Report on heavy infestation of root-knot nematode, *Meloidogyne incognita* on Sponge Gourd (*Luffa cylindrica*) from Bishnupur District, Manipur

Th. Sunita Devi \*

Department of Plant Pathology, Pandit Deen Dayal Upadhyay Institute of Agricultural Sciences, Utlou-795134, Manipur, India.

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### Abstract

Some areas of Bishnupur District were selected in which small scales of sponge gourd cultivation was done. During June to October in 2023, some areas were visited in the village where heavy infestation of root-knot nematode were noticed on the roots as well as the above ground parts. Patches growth were seen on the field. Chlorosis and yellowing of leaves which resembles nitrogen deficiency symptoms were found on leaves. Wilting of the plants, stunted growth, defected and premature fruits were also observed. Flowers were reduced and fall off easily which leads to sudden death of the plants. The roots of the plants have multiple large size galls formation. The galls formations were different, where some of the roots produced small size galls and some of the roots have very large size galls formation. Some control measures like crop rotation with non-host crops, summer deep ploughing, proper sanitation, application of neem cakes or mustard oil cakes, ashes were advised to the farmers for reduction of the nematode population as well as to promote better growth and yield production.

**Keywords:** Sponge gourd; Galls formation; *Meloidogyne incognita*; Manipur

### 1. Introduction

Sponge gourd, (*Luffa cylindrica*) is locally known as 'sebot' in Manipur, which belongs to Cucurbitaceae family. It is a good source of vitamin A and C. The young fruits are eaten as vegetable curry and "eromba" or fried with fermented dry fish which are a delicacy of Manipur. The ripen mature fruits are fibre and inedible which is used as scrubbing for bath in most household. It can also cure diabetes, purification of blood and jaundice and also for skin disease purpose. The cucurbits shares about 5.6% of the total vegetable production in India and according to FAO (2012) estimate, cultivation of cucurbits were about 42.9 lakh/ha with a productivity of about 10.52t/ha. It is a climber and need small areas for cultivation which makes possible for every household area for cultivation. On the other hand, in certain areas these crops were severely infested by plant parasitic nematode which damages the crops by consuming nutrient. The consequences caused by this plant parasitic nematode are easily visible on underground as well as above ground parts of the plants.

Root-knot nematodes (*Meloidogyne* sp.) are considered the most widespread and destructive of all the Plant parasitic nematode in the world. They belong to the family Meloidogynidae and are responsible for 5-12% losses in yield to the entire crops worldwide (Taylor, 2003). Being endoparasites and polyphagous, root-knot nematodes possess specialized adaptation for parasitism which impact economic importance. All India Coordinated Research Project Report on Plant Parasitic Nematodes with Integrated Approaches for their Control revealed that infestation on tomato, okra, chilli, brinjal, bottle gourd, snake gourd, bittergourd, cucumber and pumpkin are 11-35%, 10-29%, 8-23%, 10-42%, 21-23%, 17%, 13-14%, 6-8% and 13% respectively yield losses were found responsible by root-knot nematode on different parts of India, (Annon. 2012). These nematodes it also attacks crops which are grown in the green house, when non sterilized

\* Corresponding author: Th. Sunita Devi

soil is used (Agrios, 2005). Farmers have little knowledge and due to unawareness, the spread of root-knot nematode is increasing. The population of nematodes and pathogenicity level increases mainly due to climatic condition where some of the species of root-knot nematode have higher numbers in areas which are warm or hot climate, (Chandra et al., 2010). There have been numerous reports on root-knot nematodes causing damage to the crops. Hence present study was undertaken to carry out the survey on root-knot nematode causing infestation on sponge gourd by *Meloidogyne incognita* which was done in some areas of Bishnupur district, Manipur.

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## 2. Materials and methods

Some soil samples were collected randomly from the field and put in clean polyethene bag and tight it with a rubber band. It was brought in the laboratory and the roots samples were clean properly with a running tap water. A 250 cc of soil was used for nematode extraction by Cobb's modified sieving and decanting technique and the suspensions was collected. Nematodes were killed and stained for further microscopic study. After detection of disease on the field, alternative strategies were discussed with the growers like application of soil organic amendment of crop residues and animal manures, soil solarization, crop rotation with non host crops, use of bioagents for managing root-knot nematode (Singh and Khurma, 2007). Application of organic amendment improves the plant growth as well as productivity of crops. This organic substrate leads to build up micro flora around the soil rhizosphere, which helps in the reduction of plant parasitic nematode population and give better yield than infected susceptible crop varieties.

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## 3. Result and discussion

The present investigations revealed that large amount of sponge gourd were infected by root-knot nematode. Due to local grower's ignorance, many yield reduction were reported. It was given advised to follow the strategies to control the population in the entire field. Common methods like deep summer ploughing which will reduce the population of nematode by desiccation, application of neem cakes, growing non host crops, vermicompost and growing marigold as trap crops, are some easy methods to reduce the population in the infected area of the field. Rizwi et al (2015) observed that the growth of tomato plant in term of length, fresh and dry weight was increased when soil amended with 10g of neem cake per plant. Devi and Das (2016) reported application of neem cake @ 1 t/ha was found effective in reducing the nematode population in soil and increase plant growth parameters and yield of cucumber. Application of different types of ashes like rice straw ash, rice husk ash, banana pseudostem ash also help in reducing the population of root knot nematode. Devi and Das (2018) observed application of rice husk ash @ 30g/plant was found to be the most effective than other treatment which helps in increasing plant growth parameters and yield of cucumber. Application of talc formulation bioagents like *Trichoderma harzianum*, *Pochonia chlamydosporia*, *Paecilomyces lilacinus* against root knot nematode is also effective which has no residual effect on the soil and very good for long term field application. Devi and Das (2017) carried out field trial in which it was observed that *Trichoderma harzianum* @ 30 kg talc formulation/ha was effective in reducing the root knot nematode, *Meloidogyne incognita* infestation and increase plant growth and yield of cucumber. Fatma (2019) revealed that roots were infested by root-knot nematode in sponge gourd. Chlorotic patches on field were observed and deformed fruits were detected. Eco friendly management practices were advised to the farmers which will help in reduction of the population. It was also advised to keep the land fallow for few months and reduce the unwanted weeds to keep the field clean. It is necessary in most of the places in Manipur to give awareness program on nematodes so that the local growers can prevent their field from getting infestation.

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## 4. Conclusion

The study shows that many places in Manipur lacks knowledge about infestation of nematode therefore conducting farmer's training programme and method demonstration will enlighten the local growers about the nematode infestation. Simple management practices as mention above will help to prevent the disease development to some extent.

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## Compliance with ethical standards

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## References

- [1] Agrios, G.N. 2005. Plant Pathology, 5th edition. Academic Press, USA. 922pp.
- [2] Anonymous (2012). Consolidated Annual Report, AICRP Nematodes, P.C.Cell. Division of Nematology, IARI, New Delhi, p-160.
- [3] Chandra, P., Sao. R. S., Gautum, K. and Poddar, A.N. (2010). Initial population density and its effect on the pathogenic potential and population growth root-knot nematode (*Meloidogyne incognita*) in four species of cucurbits. Asian J. Plant Pathology. 4(1) : 1-15.c
- [4] Devi, Th. Sunita and Das, D (2016). Effect of organic amendments on root-knot nematode (*Meloidogyne incognita*) in cucumber. Pest Management in Horticultural Ecosystem. 22 (2): pp-176-181.
- [5] Devi, Th. Sunita and Das, D (2017). Efficacy of Rhizospheric biological agents for management of *Meloidogyne incognita* and growth in cucumber under field condition. Annals of Plant Protection Sciences. 25 (2): 394-398.
- [6] Devi, Th.Sunita and Das, D (2018). Potentiality of ashes against root-knot nematode (*Meloidogyne incognita*) in cucumber. Indian Journal of Nematology. 48(1): pp-46-50.
- [7] FAO, (2012), [www.faostat.fao.org](http://www.faostat.fao.org).
- [8] Fatma, G.R. and Singh. S.N. (2019). Survey of root-knot diseases of sponge gourd (*Luffa cylindrica*) at Muzaffarpur in city areas. Indian Journal of Sciences Research. 10 (2):27-32.
- [9] Rizwi, R. Singh, G.Sifiuddin, Ansari, R.A., Tiyaqi, S.A and Madmood, I (2015). Sustainable management of root-knot nematode disease of tomato by neem cake and *Glomus fasciculatum*. Congent Food and Agricultural. 1 (1) : 20-25.
- [10] Singh, S.K. and Khurmi, R.K. (2007). Susceptible of six tomato cultivars to the root-knot nematode, *Meloidogyne incognita*. The South Pacific Journal of Natural Sciences. 13: 73-77.
- [11] Taylor, A.L. (2003). Biology identification and control of root-knot nematode (*Meloidogyne* species) North Carolina State University, Raleigh, NC, USA.