



RESEARCH NOTE

Root-knot nematode, *Meloidogyne incognita* incidence on long coriander (*Eryngium foetidum* L.) in Odisha

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ABSTRACT: Long coriander (*Eryngium foetidum* L.) grown in experimental farm of ICAR-IIHR-Central Horticultural Experiment Station, Bhubaneswar, India for characterization and evaluation, showed moderate to heavy infestation of root-knot nematode with numerous small to medium sized galls or knots on the roots. Analysis of soil and root samples revealed the infestation by root knot nematode, *Meloidogyne incognita*. Plants exhibited poor stunted growth with leaf chlorosis due to severe infestation. This is the first report of root-knot nematode infestation in Long coriander from Eastern India.

Keywords: Long coriander, root knot nematode, Odisha

Long coriander (*Eryngium foetidum* L.) is a perennial spicy and medicinal leaf herb indigenous as well as medicinal leafy herb indigenous to continental Tropical America and the West Indies (Adams, 1971). It is now being grown in tropical regions of world (America, South Asia, Pacific Islands, South Europe and Africa) as a condiment in flavouring, garnishing, marinating and seasoning of foods. In India, long coriander is popularly used in Andaman & Nicobar Islands, Mizoram, Manipur, Nagaland, Assam and Tripura, and few parts of Tamil Nadu, Kerala and Karnataka; but its potential is unexplored in other parts of India. This underutilized leafy vegetable is used in traditional Indian cuisine to improve the aroma and taste of the food largely by native people.

Among the Long coriander plants grown in the experimental site at ICAR-IIHR-Central Horticultural Experiment Station, Bhubaneswar, Odisha for characterization and evaluation, around 20 percent of plant population were found to be stunted with poor foliage and had no disease symptoms (Fig. 1). Upon uprooting, it was observed that the roots were harbouring numerous galls and root decay was also observed in severe infestation. The characteristic symptoms produced on the host confirmed the presence of root knot nematode. The above ground effects of the root parasitization include lack of vigour, stunted growth, yellowing of leaves due to inability in roots function for water and nutrient uptake. Since leaves are the economic parts of the plant, nematode infestation has the potential to affect the leaf yield of the crop. In this case, around 25-30 percent reduction in leaf yield was observed.

In present study, long coriander was evaluated under partial shade net condition during 2016-2020 at ICAR-IIHR-Central Horticultural Experiment Station, Bhubaneswar and occurrence of pest and diseases were documented at periodical interval. Since galls were observed on the plants exhibited stunted growth, the uprooted plants along with soil were sent for analysis to Nematology Laboratory of ICAR - IIHR, Bengaluru to determine the presence of plant parasitic root-knot nematodes (*Meloidogyne* spp.). Nematode population in soil was analysed as per Cobb's sieving and decanting method (Cobb, 1918) and Modified Baermann's funnel technique (Southey, 1986), and in roots by acid fuchsin staining (Bridge *et al.*, 1982). Gall index was scored in 1 -5 scale as per Taylor and Sasser (1978). The results revealed that the plants were infested with root knot nematode, *Meloidogyne incognita* based on the perineal cuticular pattern of the females. The nematode population parameters was as furnished below (Table 1).

Table 1. Root knot nematode, *M. incognita* population in *E. foetidum*

Parameter	Value*
Mean Nematode population in soil per 100 cc	93.6
Mean number. of females per g root	7.2
Gall index	3.4

*mean of 3 replications

Root-knot nematode is one of the most damaging groups of plant-parasitic nematodes in vegetable cultivation, among the major pests. The previous studies on the host ranges of *Meloidogyne* species on some of the medicinal plants indicated that the plants such as hemp, parsley, ash, spearmint, and coriander are hosts of several species of root-knot nematodes (Nasresfahani *et al.*, 2008) and incidence of root-knot nematode *M. incognita* on *E. foetidum* was reported by Sheela *et al.* (2003) from Kerala and on *Coriandrum sativum*, by Singh and Gupta (2011). Root knot nematode can exist either in hot climates or short winters around the world. In case of Long coriander, the adaptive nature of *Meloidogyne* to different climatic conditions might have resulted in severe infestation. It has the widest host range, which is infecting more than 232 genera of plants and the most preferred hosts are vegetables, pulses, fibre crops, fruits, ornamentals, medicinal and aromatic plants and other important cash and plantation crops (Gowda *et al.*, 2017). Considerably, this polyphagous pest reported to cause an average 10% yield losses in vegetables crops and in highly susceptible crops it is reported to cause 30% of yield loss (Gowda *et al.*, 2017).

It is difficult to eradicate once the root knot nematodes which are established in field. Application of biological, cultural and chemical methods should be used in line with integrated pest management (IPM) practices involving cultural methods such as summer ploughing, crop rotations, destructions of crop residues, use of antagonists crops such as African marigold, *Tagetes erecta* or *Tagetes patula*, applications of organic amendments mainly neem cake (1.5 t/ha) before 10 days of planting and use of available resistant varieties, if any. In addition, biological control of nematodes are successful by using nematode antagonistic biocontrol agents such as *Paecilomyces lilacinus*, *Pochonia chlamydosporia*, *Trichoderma viride*, *T. harzianum* and nematode antagonistic plant growth promoting rhizobacteria. Need based application of nematicides in highly susceptible crops can be employed to reduce the economic damage.



Fig.1. Root-knot nematode infestation in long coriander *E. foetidum* (Left: nematode infested, Right: healthy)

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