



Short communication

First report of *Meloidogyne javanica* on ginger and *Meloidogyne incognita* on coriander in Jammu and Kashmir (India)

V.K. Singh and R.K. Gupta*

Division of Plant Pathology, S.K. University of Agricultural Sciences and Technology
Dhiansar - 181133, Jammu, India
E-mail: virendra_singh16@yahoo.com

ABSTRACT

Heavy infestation of root-knot nematode was observed on ginger and coriander grown in Gharana village and SKUAST-J Chattha farm of Jammu district of Jammu and Kashmir state. Identification of the species revealed that this is the first observed occurrence of *Meloidogyne javanica* on ginger and *M. incognita* on coriander from Jammu and Kashmir.

Key words: Root-knot nematode, *Meloidogyne javanica*, *Meloidogyne incognita*, coriander, ginger

Ginger (*Zingiber officinale* Rose) and coriander (*Coriandrum sativum* L.) are important crops in Indian farming. Root-knot nematodes, *Meloidogyne* spp., infest several agricultural and horticultural crops all over the world. The estimated overall annual yield loss in the world's major crops to damage by plant parasitic nematodes is reported to be 12.3% (Sasser and Freckman, 1987). Various species of *Meloidogyne* attack nearly every crop sown where, not only are yields greatly affected but quality is also compromised (Sasser, 1980). Nematode infestation is one of the most important factors contributing to low productivity of crops (Dabur and Nandal, 2009). Root-knot nematode was observed on the local ginger crop in the field, of Mr. Manjeet of Gharana village located at 300m amsl, and on coriander (cv. Khushbu) from the experimental field of Chatha Farm, located at 296m amsl of Jammu district of Jammu and Kashmir. Symptoms included root galling, leaf chlorosis and stunting. On uprooting these plants, numerous, small to very big sized galls/knots were noticed on the roots, resulting in a very poorly developed root system. Specific identity of the nematode was determined by the perineal pattern of the females (Goodey, 1963). The galled root system from affected plants was washed in water and immersed in a beaker containing boiling 0.1% Cotton Blue and left overnight for clearing. Female nematodes were teased out from the galls and transferred to a drop of lactophenol taken on a clean glass slide. The posterior portion of the females was carefully cut with a sharp razor blade and the body contents were cleaned. The perineal pattern

of the females was trimmed and mounted for observation as per Taylor *et al* (1955). For each observation, ten slides containing the perineal pattern were prepared. Stylet length, head shape and length of the juvenile nematode were recorded.

Meloidogyne javanica: Female body pear-shaped, without posterior protuberance. Perineal pattern rounded, with distinct lateral lines. Stylet length ranging from 14.5 to 18.2 μm ; knobs ovoid and offset; Male head not offset from the body, Head cap rounded and set off, usually labial disc not elevated and lateral lips not present; Second stage juvenile body 403.5 to 565.6 μm long; Tail slender, 48.3 to 61.5 μm in length; hyaline tail part 10.2 to 20.1 μm long and tail-tip finely rounded.

Meloidogyne incognita: Female body pear-shaped, without posterior protuberance; Perineal pattern usually with relatively high dorsal arch and without lateral lines; Stylet ranging in length from 15.3 to 17.1 μm , knobs rounded and offset; Male head not offset from the body; Head cap with elevated labial disc, usually without lateral lips, head region often with incomplete head annulations; Second stage juveniles' body 352.5 to 452.2 μm long; Tail slender, 44.5 to 66.2 μm in length, hyaline tail part 7.1 to 15.2 μm long, anterior regions clearly delimited, tail-tip rounded.

Identification of the species was made by comparing characteristics observed in the perineal region with description given by Eisenback *et al*, (1980). Thus, based on



Fig 1. Root-knot nematode infested ginger



Fig 2. Root-knot nematode infested coriander plant roots

the perineal pattern, stylet length, head shape, and juvenile length studies, the said root-knot nematode species were identified as *Meloidogyne javanica* and *Meloidogyne incognita*. To our knowledge, this is the first report of *M. javanica* on ginger and *M. incognita* on coriander in Jammu and Kashmir (India).

REFERENCES

- Chitwood, B.G. 1949. Root-knot nematode - Part 1. A revision of the genus *Meloidogyne* Goeldi, 1887. *Proc. Helm. Soc. Wash.*, **16**:90-104
- Dabur, K.R. and Nandal, S.N. 2009. Assessment of yield losses due to phytonematodes in India. *Ind. J. Nematol.*, **39**:237
- Eisenback, J.D., Hirshchmann, H. and Triantaphyllon, A.C. 1980. Morphological comparison of *Meloidogyne* female head structures, perineal patterns and stylets. *J. Nematol.*, **12**:300-313
- Goodey, J.B. 1963. Laboratory methods for work with soil and plant nematodes. Technical Bulletin, Ministry of Agriculture, London, p. 72
- Jain, R.K., Mathur, K.N. and Singh, R.V. 2007. Estimation of losses due to plant parasitic nematodes on different crops in India. *Ind. J. Nematol.*, **37**:219- 221
- Sasser, J.N. 1980. Root-knot nematodes: a global menace to crop production. *Pl. Dis.*, **64**:38-41
- Sasser, J.N. and Freckman, D.W. 1987. A world perspective of Nematology. The role of Society. In: *Vistas on Nematology* (Veech, J.A. and Diskson, D.W. Eds.), Published. by Society of Nematologists, U.S.A., pp. 7-14
- Taylor, A.H., Dropkin, V.H. and Martin, G.C. 1955. Perineal patterns of root-knot nematodes. *Phytopath.*, **45**: 26-34

(MS Received 04 August 2010, Revised 10 May 2011)