Disease Note

Diseases Caused by Nematodes

Eryngium foetidum Reported as a New Host of *Meloidogyne enterolobii* in the State of Pará, in the Eastern Amazon Region, Brazil

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Amazon chicory (*Eryngium foetidum* L. [Apiaceae]), also known as culantro, is native to tropical America and the West Indies. It belongs to the unconventional food plant group, and in addition to being consumed as a spice herb, it possesses a wide range of ethnomedicinal uses (Paul et al. 2011). In 2019, in the eastern Amazon region of Brazil, state of Pará, producers of *E. foetidum* in the municipality of Castanhal (1°17′33′′S 47°57′41′′W) reported the occurrence of underdeveloped plants with leaf yellowing and a large number of galls in the root system, which are typical symptoms of root-knotting nematodes. Soil and root samples were collected and sent to the Nematology Laboratory (LabNema) located at the Faculty of Agrarian and Veterinary Sciences, UNESP, Jaboticabal, São Paulo, Brazil. A total of 46 second-stage juveniles (J2s) were extracted per 100 cm^3 of soil, and a total of 460 eggs and J2s *Meloidogyne* spp. were found per gram of root. Morphological and molecular techniques were used to identify the species. The analysis of the perineal pattern of 10 females revealed thin striations in an oval shape with a high and semitrapezoidal dorsal arch. No striations were observed in the perivulvar region. The labial region of the 10 males analyzed exhibited a nonprominent labial disc, fused and slightly recessed submedian lips, with no apparent annulations. The morphological characteristics observed in the adults were consistent with those originally described for *Meloidogyne enterolobii* (Yang and Eisenback 1983), confirming the species purity of the recovered population. Three individual nematodes had their 18S rDNA region sequenced (Holterman et al. 2006), which showed an average identity of 99.7% with other sequences of *M. enterolobii* available in the GenBank database. A Bayesian phylogenetic tree was constructed, providing insights into the specific relationship of *M. enterolobii* recovered from *E. foetidum* with other related nematodes. Each of the three sequenced nematodes represented a unique haplotype, resulting in their separation into distinct clades. Moreover, the obtained sequences presented polymorphisms that differed from the *M. enterolobii* sequences already available in the database, highlighting the genetic diversity of this species in relation to its original host (Silva et al. 2021). The species *M. enterolobii* was also confirmed using species-specific primers for *M. incognita*, *M. javanica*, and *M. enterolobii* (Tigano et al. 2010; Zijlstra et al. 2000). To confirm the pathogenicity of *M. enterolobii* on *E. foetidum*, a modified Koch's postulate was conducted. Six seedlings of *E. foetidum* were transplanted individually to 10-liter pots containing autoclaved soil. Each pot was then inoculated with 5 ml of a suspension containing 3,000 eggs and J2s from the original population of *M. enterolobii* obtained from *E. foetidum*. After 90 days, the inoculated plants exhibited root galls with a plentiful egg mass, in contrast to the healthy noninoculated plants. The average number of *M. enterolobii* nematodes recovered from the roots of the inoculated plants was 42,040 eggs and J2s, resulting in a reproduction factor of 14.0. The importance of reporting the occurrence of *M. enterolobii* in *E. foetidum* is due to the fact that this plant species is cultivated in a crop rotation system with other vegetables such as lettuce and coriander, which are also hosts of *M. enterolobii*. Consequently, different crop rotation strategies and control alternatives need to be considered in areas where *E. foetidum* is grown. This is the first report of *E. foetidum* serving as a host for the root-knot nematode *M. enterolobii* worldwide.

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