Diseases Caused by Nematodes

First Report of *Meloidogyne enterolobii* Infecting *Mesona chinensis* in China

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Funding: This research was supported by National Natural Science Foundation of China (32160627). Plant Dis. 106:1999, 2022; published online as <https://doi.org/10.1094/PDIS-12-21-2720-PDN>. Accepted for publication 13 January 2022.

Mesona chinensis Benth is a perennial herb of edible and medicinal value. It is commonly used to cure heatstroke and fever and treat diseases including diabetes, hypertension, and acute nephritis in modern medicine (Li et al. 2020). In May 2020, *M. chinensis* plants presented reduced growth and leaf wilting associated with root galls at the agricultural base of Guangxi University (22°50'28.41" N, 108°17'9.00" E), China. Digging up the roots of the *M. chinensis* plants revealed many root knots. An average of 689 ± 28 eggs and second-stage juveniles (J2s) of *Meloidogyne* spp. were collected per gram of fresh weight roots. Population densities of the J2s averaged 386 ± 16 per 100 cm³ of soil. The female perineal pattern was usually oval shaped with the dorsal arch being moderately high to high and often rounded. The J2s were truncate with a rounded head region and slender body. Tails were narrow with pointed tips and had distinct hyaline tail termini. The morphological measurements (mean $\pm$ standard deviation) of the females ($n = 10$) were: body length = 689.7 ± 11.5 μ m; width = 549.3 ± 42.9 μ m; stylet length = 15.1 ± 1.0 μ m; and dorsal esophageal gland orifice (DGO) = 5.4 ± 0.5 μ m. Measurements of males ($n = 12$) were: body length = $1,341.0 \pm 96.2$ μ m; width = 38.6 ± 4.2 μ m; and DGO = 4.4 ± 0.1 μ m. The J2s ($n = 20$) were: body length = 436.1 ± 12.5 μ m; body width = 15.7 ± 0.8 μ m; stylet

length = 12.4 ± 0.8 μ m; and DGO = 3.8 ± 0.3 μ m. Individual J2 ($n = 4$) DNA was further explored using the primers 18S/26S (TTGATTACGTCCTGC CCTTT/TTTCACTCGCCGTTACTAAGG), C2F3/1108 (GGTCAATGTTC AGAAATTTGTGG/TACCTTTGACCAATCAGCT), and D2A/D3B (ACA AGTACCGTGAGGGAAAGT/TCGGAAGGAACCAGCTACTA) (Ley et al. 1999; Powers and Harris 1993; Vrain et al. 1992). Three fragments (765 bp [GenBank accession no. OL663830], 705 bp [OL780766], and 759 bp [OL681885]) were amplified and had 100% sequence homology with *M. enterolobii* (MT406251, MN269947, and MT193450, respectively). Species-specific primers Me-F/Me-R were used for amplification of rDNA-IGS2. An expected PCR fragment of approximately 236 bp was obtained; this fragment is not presented in *M. incognita* populations (Long et al. 2006). Therefore, the unknown nematode was further identified as *M. enterolobii*. To perform Koch's postulates, *M. enterolobii* from *M. chinensis* roots was inoculated onto tomato plants for propagation, and eggs were extracted from tomato roots. Greenhouse tests were conducted after inoculating 0 or 5,000 eggs into 1-month-old healthy *M. chinensis* cuttings grown in pots filled with sterilized substrates. After 60 days, the inoculated plants ($n = 12$) exhibited galled root symptoms, and the noninoculated plants ($n = 10$) exhibited no galls. A reproduction factor of 13.2 ± 3.3 was obtained, confirming the pathogenicity of *M. enterolobii* on *M. chinensis*. To our knowledge, this is the first report of a natural infection of *M. enterolobii* on *M. chinensis*. It is likely that *M. enterolobii* may be causing a high level of loss on *M. chinensis* in southern China.

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The author(s) declare no conflict of interest.

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Keywords: medicinal plant, *Meloidogyne enterolobii*, *Mesona chinensis*, new host, root-knot nematode

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