Diseases Caused by Nematodes

First Report of *Meloidogyne enterolobii* on Thai Basil in Florida, United States

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Thai basil (*Ocimum basilicum* var. *thyrsiflora*) is an important ethnic aromatic herb native to Southeast Asia. According to the Vegetable Production Handbook of Florida 2020–2021, Asian vegetables are currently grown on more than 4,000 ha in Florida, and Thai basil is one of the most commonly grown among these. *Meloidogyne* spp. cause severe damage to different basil cultivars (Brito et al. 2007). From May to July 2020, plant stunting and galled root symptoms were observed on Thai basil plants sampled from a commercial Asian vegetable farm in Wimauma, Florida (27°44.951' N; 82°16.271' E); 1,972 root-knot nematode second-stage juveniles (J2s) were extracted from 200 cm³ of soil. A pathogenicity test was performed in September 2020 at the University of Florida Gulf Coast Research and Education Center, Wimauma, Florida. Ten of 20, 3-week-old nematode-free Thai basil plants were inoculated with 5,000 eggs of field nematode cultures. Two months after inoculation (temperature = 22.8 ± 3.8°C, relative humidity = 85.6 ± 14.0%), an average gall index (Bridge and Page 1980) of 5.4 ± 1.1 was only observed in inoculated plants, and 69,276 ± 18,904 eggs were extracted from roots using the NaClO method (Hussey and Barker 1973); 5 ± 7 J2s/200 cm³ of soil were recovered by the modified Baermann funnel technique (Forge and Kimpinski 2007). Nematode reproduction factor (RF) = 13.86 ± 3.78 (Nicol et al. 2010). Morphological measurements (mean, standard deviation, and range) of J2s (*n* = 20) included body length = 394.0 ± 22.3 (362.8 to 437.9) µm, body width = 15.7 ± 1.2 (13.6 to 18.3) µm, and stylet length = 12.8 ± 1.1 (10.4 to 14.5) µm. The perineal pattern of mature females (*n* = 5) was oval-shaped with coarse and smooth striate; the dorsal arch was high and round; no lateral line presented.

Morphological characteristics of females and J2s were consistent with those described for *Meloidogyne enterolobii* (Yang and Eisenback 1983). DNA was extracted from a single female picked from infected Thai basil root using the NaOH digestion method (Hübschen et al. 2004). The D2-D3 expansion segment of 28S rDNA and the COXII region on mitochondrial DNA were amplified by PCR using the primers 28S391a/28S501 and C2F3/1108 (Ye et al. 2021); the species was also confirmed with species-specific primers Me-F/Me-R (Ye et al. 2021). PCR products were sequenced by the Genomic Sciences Laboratory (North Carolina State University, Raleigh, NC), and the results were recorded with GenBank accession numbers MW488150 and MW507374. The sequences showed 100% identity with *M. enterolobii* in D2-D3 (KP901079, KP411230) and COXII (MN809527, KX214350). *M. enterolobii* (*M. mayaguensis*) has been reported on sweet basil in Florida (Brito et al. 2008). To our knowledge, this is the first detection of *M. enterolobii* on Thai basil in Hillsborough County, Florida. It is not clear to what extent *M. enterolobii* reduces the yield of Thai basil, but the RF value obtained in the pathogenicity test indicates the crop is certainly a very good host. Limited information is available on the distribution of *M. enterolobii* in Florida and the United States. *M. enterolobii* is known to break down the root-knot resistance of crops including soybean, sweet potatoes, and tomatoes (Philbrick et al. 2020). This nematode is considered one of the major emerging threats to agriculture in the southeastern United States. A multistate research and outreach program (FINDMe program) was initiated in 2019 to study the distribution and management of this nematode in the southeastern United States.

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