Diseases Caused by Nematodes

First Report of *Meloidogyne incognita* Infecting *Stachys byzantina* in Brazil

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Funding: Part of financial support by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) - Brazil - Finance Code 001. Plant Dis. 105:510, 2021; published online as <https://doi.org/10.1094/PDIS-07-20-1628-PDN>. Accepted for publication 21 September 2020.

Stachys byzantina C. Koch (Lamiaceae alt. Labiatae), commonly known as lamb's ear, is an important medicinal plant with anti-inflammatory, antitumor, anticancer, antispasmodic, sedative, and diuretic properties (Asnaashari et al. 2010). This plant is widely consumed in Europe and Asia as aromatic teas. In Brazil, it is an unconventional food plant; nonetheless, its medicinal properties have been recognized as well as its production. In May 2019, in a São Paulo State municipality, Jaboticabal, (21°14'38.7"S, 48°17'10.6"W), *S. byzantina* plants presented reduced growth and chlorotic leaves associated with root galls. In the phytopathological clinic, 7,983 eggs and juveniles of *Meloidogyne* sp. were counted in 10 g of the plant roots. In 100 cm³ of soil surrounding the plant, 532 second-stage *Meloidogyne* sp. juveniles were found. Morphological, enzymatic, and molecular identification of the nematode species found was performed. For morphological analysis, the perineal pattern of females ($n = 10$) and labial region of males ($n = 10$) were analyzed. In the perineal region of females, a high and trapezoidal dorsal arch with thick striations was observed, whereas the males presented a trapezoidal labial region with a prominent labial disc in relation to the submedian lips and transverse streaks in the head region,

typical characteristics of *Meloidogyne incognita* (Kofoed and White, 1919) Chitwood 1949 (Eisenback and Hirschmann 1981; Netscher and Taylor 1974). The esterase enzyme profile, obtained individually from eight females, was compatible with phenotype II [Rm ($\times 100$) = 46.25], also associated with *M. incognita* (Esbenshade and Triantaphyllou 1985). Molecular analysis was realized ($n = 3$) by applying the primers Finc/Rinc (Zijlstra et al. 2000) in the DNA of individual females, which resulted in the amplification of an amplicon of 1,200 bp specific for *M. incognita*. Pathogenicity testing was conducted in a greenhouse by inoculation of 5,000 eggs and juveniles from the original population into *S. byzantina* seedlings ($n = 4$). After 90 days, the inoculated plants, unlike the noninoculated ones, exhibited symptoms similar to those initially observed in the field. The nematodes were extracted from the roots of the inoculated plants and quantified, and the identity of *M. incognita* was confirmed. The average reproductive factor obtained was 136.6, confirming the pathogenicity of *M. incognita* to *S. byzantina*. Thus, this is the first report of *M. incognita* associated with *S. byzantina* in Brazil and in the world. Lamb's ear is a horticultural plant, and its high reproductive factor to *M. incognita* can also result in damage to the subsequent crops. In addition, Lamb's ear is propagated vegetatively, and this favors the spread of nematodes to other areas. This new report is important in order to alert producers to realize the proper management of this nematode in *S. byzantina*.

References:

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The author(s) declare no conflict of interest.

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Keywords: *Meloidogyne incognita*, *Stachys byzantina*, lamb's ear, root-knot nematode, field crops, nematodes, pathogen detection

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