Diseases Caused by Nematodes

First Report of *Meloidogyne javanica* on Globe Artichoke in Florida, U.S.A.

M. Gu,^{1,†} H. X. Bui,^{1,†} J. A. Desaegeer,¹ and S. Agehara²

¹ Department of Entomology and Nematology, Gulf Coast Research and Education Center, University of Florida, Wimauma, FL 33598

² Horticulture Department, Gulf Coast Research and Education Center, University of Florida, Wimauma, FL 33598

Plant Dis. 106:2001, 2022; published online as <https://doi.org/10.1094/PDIS-10-21-2360-PDN>. Accepted for publication 10 December 2021.

Globe artichoke (*Cynara cardunculus* var. *scolymus* L.) is native to the Mediterranean region and cultivated worldwide for its edible flower buds and the medicinal value of its leaves (Pignone and Sonnante 2004). In 2019, artichokes were planted on 29 km², predominantly in California, with a yield of over 100 million kg (USDA National Agricultural Statistics Service 2020). It has been grown as a specialty crop in Florida since 2017 (Agehara 2017a). *Meloidogyne* spp. (root-knot nematodes [RKNs]) can lead to artichoke yield losses (Greco et al. 2005). In June 2020, artichokes (cv. Imperial Star) with stunting, wilting, and galled-root symptoms were observed in a research field with sandy soil at the University of Florida Gulf Coast Research and Education Center (UF/GCREC), Wimauma, Florida. The goal of this report was to identify the RKN species collected from two symptomatic artichoke roots. Morphological measurements (mean, standard deviation, and range) of 15 second-stage juveniles included body length = 409.1 ± 31.6 (360.3 to 471.3) µm, body width = 15.4 ± 1.6 (12.4 to 18.8) µm, and stylet length = 14.7 ± 0.7 (13.9 to 16.1) µm. Perineal patterns of five matured females had a high dorsal arch and double lateral lines. Morphological characteristics of the RKN cultures were consistent with the description of *Meloidogyne javanica* (Eisenback and Triantaphyllou 1991). DNA was extracted respectively from two RKN females isolated from the diseased artichoke roots. The nematode species was confirmed with primers Fjav/Rjav and resulted in an approximately 670-bp fragment (Zijlstra et al. 2000). The COXII region of mtDNA was amplified by C2F3/I108 (Powers and Harris 1993), and the sequencing result was submitted to NCBI GenBank with accession no. MZ397905. The molecular sequence had 100% identity with *M. javanica* in COXII (MK033440 and MK033439). The pathogenicity test was conducted in the greenhouse at the UF/GCREC from May to August 2021 (temperature = 26.7 ± 4.1°C, relative humidity = 83.9 ± 14.6%). Each of the 10 6.5-in-diameter plastic

pots containing 3.8 liters of pasteurized soil was seeded with one artichoke seed. Five pots were inoculated with 5,000 eggs of the field RKN cultures 4 weeks after planting, and five pots were used as the untreated control. Two months after inoculation, galled symptoms were only observed in inoculated plants with an average gall index (Bridge and Page 1980) of 6.2 ± 2.2; 99,240 ± 72,250 eggs were extracted from each root system, and the nematode reproduction factor was 19.9 ± 14.4. *Meloidogyne* spp. has been reported on artichoke in Europe, Asia, and South America (Greco et al. 2005). This is the first report of RKN on artichoke in the United States. *M. javanica* caused severe root gall symptoms and visible aboveground damage in the form of chlorosis, stunting, and wilting of artichoke planted at the UF/GCREC research farm. *M. javanica* is the predominant RKN species at the UF/GCREC research farm and one of the most common RKNs in Florida (Gu and Desaegeer 2021). Artichoke is a new crop in Florida, and RKNs are likely to be one of the main soilborne problems for its production in the state. Its long growing season (October to May) (Agehara 2017b) allows for high nematode reproduction rates. Several new growers have already reported RKNs as a problem in their fields. For artichoke to become a commodity in Florida, managing RKNs will be critical. This report provides new information on the risk that RKNs pose to artichoke, a newly established specialty crop in Florida.

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The author(s) declare no conflict of interest.

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Keywords: Florida, globe artichoke, *Meloidogyne javanica*, root-knot nematode, United States

[†]Indicates the corresponding authors.

M. Gu; mengyi.tina.gu@gmail.com, and H. X. Bui; hungbui@ufl.edu