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Abstract

Soil samples collected during a survey for plant-parasitic nematodes in Tift County GA in summer 2017 were submitted for routine diagnosis of nematodes to the Extension Nematology Lab at the Department of Plant Pathology, University of Georgia, Athens, Georgia. Cyst nematodes recovered by centrifugal flotation technique were discovered in the samples from two research sites in a field with a history of tobacco and vegetable production. Cyst nematodes from tobacco (10 cysts/100 cm³ of soil) and vegetable (2 cysts/100 cm³ of soil) sites had similar morphological features. Morphology and morphometric measurements of the cysts and J2 (Fig. 1A–C) were in agreement with those of *Heterodera cyperi* (Golden et al., 1962; Romero and López-Llorca, 1996). Measurements of J2 (*n* = 12) included the length (range = 443–494 μm, mean = 467.4 μm) and width (18.3–24.4 μm, 20.6 μm) of body, stylet (19.1–20.8 μm, 20.3 μm), tail (61.6–66.4 μm, 64.2 μm), body width at anus (11.9–14.1 μm, 12.8 μm), and hyaline tail terminus (22.7–29.2 μm, 26.3 μm). The lateral field of J2 had three lines. Cysts (*n* = 10; Fig. 1C) were lemon-shaped, light to dark brown in color with protruding neck and vulval cone. The cysts had ambifenestrated vulval cone and no bullae was present. Morphometrics included body length excluding neck (370.5–714.4 μm, 555.7 μm); body width (165.6–411.1 μm, 310.9 μm); neck length (36.5–66.3 μm, 49.8 μm); fenestra length (26.3–42.5 μm, 35.8 μm), and fenestra width (19.1–31.5 μm, 23.8 μm). DNA was extracted from single cysts (*n* = 3) and internal transcribed spacer (ITS) of rRNA and partial cytochrome oxidase I (COI) genes were amplified with primers TW81/AB28 and Het-coxiF/Het-coxiR, respectively (Subbotin et al., 2001; Subbotin, 2015) and sequenced. The resulting sequences were deposited into the GenBank database (Accession no. MG825344 and MG857126) and also subjected to BLAST searches in the database. ITS sequence of *H. cyperi* showed 100% similarity (100% coverage) with that of a *H. cyperi* population from Spain (AF274388). COI sequence of *H. cyperi* showed 89% similarity (98% coverage) with that of *H. guangdongensis* (MF425735), and 88% similarity (83% coverage) with that of *H. elachista* (KC618473). The pathogenicity of *H. cyperi* was examined under greenhouse conditions using tobacco cv. K340, tomato cv. Tribute, cucumber cv. Thunder, and yellow nutsedge (*Cyperus esculentus* L.). 3-wk-old seedlings of the test plants were transferred into Deepot D25L cell containers (5-cm-diam. × 25.4-cm deep) filled with sterilized sand: soil mixture (1:2) and then inoculated with 1,000 eggs and J2 of *H. cyperi*. The plants were grown for 90 d in a greenhouse before examination of roots and extraction of cysts from the soil. Results showed that the nematode failed to reproduce on tobacco, tomato, and cucumber whereas white females and mature cysts of *H. cyperi* were observed on yellow nutsedge roots.
References


