plant disease

Editor-in-Chief: Alison E. Robertson
Published by The American Phytopathological Society

About the cover for August 2017

ISSN: 0191-2917

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August 2017, Volume 101, Number 8
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https://doi.org/10.1094/PDIS-12-16-1749-PDN

DISEASE NOTES

First Report of a New, Unnamed Lesion Nematode *Pratylenchus* sp. Infecting Soybean in North Dakota

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Citation

ABSTRACT

Lesion nematodes (*Pratylenchus* spp.) are important pests on soybean. In 2015 and 2016, nematodes in 11 soil samples from a soybean field in Richland County, ND, were extracted by decanting and sugar centrifugal flotation method (Jenkins 1964). Ten samples contained lesion nematodes ranging from 150 to 875/kg of soil. Soybean cultivar Barnes (*n* = 4) was grown in a soil sample containing 300 lesion nematodes/kg of soil. After 15 weeks of growth at 22°C in the greenhouse, the *Pratylenchus* population increased to 460 ± 181/kg soil. After rinsing with water, brown lesions were observed on soybean roots. The roots were cut into small pieces from which nematodes were extracted with Whitehead tray method (Whitehead and Hemming 1965); after 48 h, the lesion nematodes recovered amounted to 34 ± 21/g of fresh roots. Successful nematode infection was indicated by its reproductive factor of 3.76, calculated by dividing the final population (564 = 460 nematodes/kg soil × 0.5 kg soil/pot + 34 nematodes/g root × 9.835 g root/pot) by the initial population (150 = 300 nematodes/kg soil × 0.5 kg soil/pot). Lesion nematodes were hand-picked and examined under a compound microscope. Measurements of adult females (*n* = 20) were body length (mean = 409.0 µm, range = 317.0 to 505.0 µm), stylet (14.9, 12.5 to 17.0), body width (17.4, 14.5 to 22.0), head end to posterior end of esophageal glands (105.0, 80.0 to 125.0), anal body width (10.2, 8.0 to 13.5), tail length (20.7, 17.5 to 25.0), tail annules (20.0, 15.0 to 25.0), a (23.4, 16.7 to 32.6), b (3.9, 3.2 to 5.0), c (19.5, 17.1 to 22.5), c' (2.1, 1.8 to 2.6), and V (77.6%, 75.3 to 80.3). Morphological data of adult males (*n* = 4) were body length (429.2, 395.0 to 500.0), stylet (14.0, 12.5 to 15.5), body width (18.6, 17.0 to 21.0), head end to posterior end of esophageal glands (105.0, 100.0 to 110.0), anal body width (9.5, 9.0 to 10.0), tail length (20.0, 18.0 to 24.0), a (21.2, 20.6 to 29.4), b (4.3, 4.2 to 4.5), c (22.4,

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Issue Date: 13 Jul 2017
Published: 12 May 2017
First Look: 3 Apr 2017
Accepted: 29 Mar 2017

17.7 to 25.6), c' (2.3, 2.2 to 2.4), spicule (17.5, 15.0 to 20.0), and gubernaculum (5.8, 4.5 to 7.5). DNA was extracted from single nematodes (*n* = 12) collected from soil and roots. D2-D3 of 28S rRNA (Subbotin et al. 2008) and ITS of rDNA (Yan and Smiley 2010) were amplified and sequenced. The ITS rDNA (KY200666, 981 bp) shared 95% sequence identity with *P. alleni* and low identity (≤87%) with other *Pratylenchus* spp. The D2-D3 (KY200665, 766 bp) had the highest identity of 96% with *P. scribneri* and 95% identity with *P. hexincisus*. No sequence of *P. gibbicaudatus* or *P. flakkensis* is available in GenBank. This species is very close to *P. alleni* but differs in having a slightly longer stylet, variations in tail shape, truncate to bluntly or broadly rounded tail with an annulated to occasionally smooth tail terminus, 4 to 6 lines in lateral field and 2 to 3 head annules. It is closely related to *P. hexincisus*, *P. gibbicaudatus*, and *P. flakkensis* but differs from them by one or more other characters: shape of head, number of head annules, tail shape, and V%. To our knowledge, this North Dakota *Pratylenchus* sp. population represents a new species of lesion nematode able to parasitize soybean.

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