

Plant Nematodes Occurring in Arkansas

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Abstract: A total of 110 species of plant nematodes were found in various habitats in Arkansas. Thirty species from 19 genera are reported here for the first time. Included in the new reports are the known plant pathogens *Criconebella onoense*, *Hirshmanniella oryzae*, *Longidorus elongatus*, and *Pratylenchus pratensis*.

Key words: Arkansas, geographic distribution, host record, survey.

Management of nematodes is an important aspect of successful agricultural plant production. Development of effective management methods requires accurate identification of the genera and species of nematodes relevant to different plant species and production environments.

Several reports include records of nematode occurrences in Arkansas (2,3,5,7-11,14,15,17,18,20,21). Six new species were described from Arkansas in recent years: *Californidorus clavicaudatus* Robbins; *C. cralleyi* Robbins; *C. cylindricaudatus* Robbins (16); *Dolichodorus cobbi* Golden, Handoo & Wehunt (4); *Dolichodorus grandaspicatus* Robbins (13); and *Hoplolaimus magnistylus* Robbins (12). The purpose of this report is to document some additional plant nematode species that exist in Arkansas.

This is a report of nematodes found over several years in samples from field experiments, in samples taken in planned surveys, in samples submitted for nematode assay, and in samples taken for curiosity. Samples were collected primarily with soil tubes or blade-type implements and sealed immediately in plastic bags. The soil was mixed thoroughly and a 150-cm³ subsample was processed by the sugar-centrifugation process (6), or a 236-cm³ sample was processed by the Baermann funnel method as modified (1). Extracted nematodes were examined under a stereoscopic microscope

and identified to genus. Specimens representative of the genera were preserved in 3% formaldehyde solution, examined under a compound light microscope, and identified to species.

Eighty plant nematodes species were reported previously from Arkansas. Our sampling and research identified an additional 30 species (Table 1). Unidentified species of *Aorolaimus*, *Coslenchus*, *Criconebella*, *Gracilacus*, *Helicotylenchus*, *Hemicriconebellodes*, *Hemicyclophora*, *Hirshmanniella*, *Longidorus*, *Meloidogyne*, *Nothocriconebella*, *Rotylenchus*, *Tylenchulus*, *Xenocriconebella*, and *Xiphinema* are included. Specimens of nematodes reported herein for the first time in Arkansas are deposited in the USDA nematode collection at Beltsville, Maryland, or in the University of Arkansas nematode collection at Fayetteville.

Previous reports of nematode damage to important crops in Arkansas include *Aphelenchoides besseyi* Christie—rice (3) and strawberry (18); *Heterodera glycines* Ichinohe—soybean (10); *Pratylenchus coffeae* (Zimmerman) Filipjev & Sch. Stek.—strawberry (11); and *Xiphinema americanum* Cobb—soybean (7). Little information is available concerning the importance of many of the other nematodes recorded here to Arkansas crops. Research from other localities, however, suggests that several of these species may also be important plant pests in Arkansas.

The nematodes reported here are from samples representing only a small portion of Arkansas. Nematodes occurring in forests, pastures, wetlands, and other uncultivated areas as well as many cultivated areas are virtually unknown. It is likely that additional species exist in Arkansas, and ef-

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TABLE 1. Plant nematodes found in Arkansas.

Nematode	Association†	Reference
<i>Aorolaimus helicus</i> Sher	Turfgrass, noncultivated	8, 15
<i>Aorolaimus</i> sp.	Noncultivated	15
<i>Aphelenchoides besseyi</i> Christie	Rice (<i>Oryza sativa</i> L.), strawberry (<i>Fragaria</i> × <i>Ananassa</i> Duch.), soy- bean, (<i>Glycine max</i> (L.) Merr.)	3, 8, 18
<i>Belonolaimus nortoni</i> Rau	Soybean, noncultivated	8, 9, 14, 15
<i>Bursaphelenchus xylophilus</i> (Steiner & Buhrer) Nickle	Pine (<i>Pinus</i> sp.), noncul- tivated	15
<i>Cactodera cacti</i> (Filipjev & Sch. Stek.) Krall & Krall	Noncultivated	8, 15
<i>C. weissi</i> (Steiner) Krall & Krall	Smartweed (<i>Polygonum</i> sp.), noncultivated	8, 15
<i>Californidorus clavicaudatus</i> Robbins	Willow (<i>Salix</i> sp.), sweet- gum (<i>Liquidamber sty- raciflua</i> L.), grape (<i>Vitis</i> sp.), hackberry (<i>Celtis</i> <i>occidentalis</i> L.)	16
<i>C. cralleyi</i> Robbins	Red haw (<i>Cratageus san- guinea</i> Pall)	16
<i>C. cylindricaudatus</i> Robbins	Elm (<i>Ulmus americanum</i> L.), sweet gum, and other trees	16
<i>Coslenchus</i> sp.	Peach (<i>Prunus persica</i> (L.) Batsch.)	This report
<i>Criconema demani</i> Micoletzky	Alfalfa (<i>Medicago sativa</i> L.)	This report
<i>C. mutabile</i> (Taylor) Luc & Raski	Peach	This report
<i>Criconema</i> spp.	Noncultivated	15
<i>Criconemella axeste</i> (Fassuliotis & Williamson) Luc & Raski	Forest	This report
<i>C. denoudenii</i> (De Grisse) Luc & Raski	Bermudagrass (<i>Cynodon</i> <i>dactylon</i> (L.) Pers.)	This report
<i>C. macrodora</i> (Taylor) Luc & Raski	Soybean	17
<i>C. onoense</i> (Luc) Luc & Raski	Forest	This report
<i>C. ornata</i> (Raski) Luc & Raski	Peach, soybean	17
<i>C. xenoplax</i> (Raski) Luc & Raski	Peach	20
<i>Dolichodorus cobbi</i> Golden, Handoo & Wehunt	Forest	4
<i>D. grandaspicatus</i> Robbins	Maple (<i>Acer</i> sp.)	13
<i>Gracilacus aculentus</i> (Brown) Raski	Noncultivated	15
<i>G. aciculus</i> (Brown) Raski	Noncultivated	15
<i>G. latescens</i> Raski	Noncultivated	15
<i>G. sarissus</i> (Tarjan) Raski	Forest	This report
<i>G. straeleni</i> (deConinck) Raski	Fescue (<i>Festuca arundina- cea</i> Schreb.)	This report
<i>Gracilacus</i> spp.	Noncultivated	15
<i>Helicotylenchus crenacauda</i> Sher	Bermudagrass	This report
<i>H. dihystra</i> (Cobb) Sher	Soybean, noncultivated	8, 14, 15, 17
<i>H. exallus</i> Sher	Bermudagrass	This report
<i>H. pseudorobustus</i> (Steiner) Golden	Soybean, noncultivated	8, 14, 15, 17
<i>Helicotylenchus</i> spp.	Noncultivated	15
<i>Hemicriconemoides</i> sp.	Noncultivated	15
<i>Hemicyclophora triangulum</i> Loof	Soybean	14
<i>Hemicyclophora</i> spp.	Noncultivated	15
<i>Heterodera betulae</i> Hirshmann & Riggs	River birch (<i>Betula nigra</i> L.), spiderflower (<i>Cleome spinosa</i> Jacq.), locust (<i>Robinia</i> sp.), non- cultivated	5, 8, 15

TABLE I. Continued.

Nematode	Association†	Reference
<i>H. cyperi</i> Golden, Rau & Cobb	Yellow nut-grass (<i>Cyperus esculentus</i> L.)	8
<i>H. glycines</i> Ichinohe	Soybean, noncultivated	8, 11, 14, 15, 17
<i>H. schachtii</i> Schmidt	Noncultivated	15
<i>H. trifolii</i> Goffart	Clovers (<i>Trifolium</i> spp.), noncultivated	8, 15
<i>Hirschmanniella oryzae</i> (van Breda de Hann) Luc & Goodey	Pasture	This report
<i>H. spimicaudatus</i> (Sch. Stek.) Luc & Goodey	Cattails (<i>Typha</i> sp.)	This report
<i>Hirschmanniella</i> sp.	Noncultivated	15
<i>Hoplolaimus galeatus</i> (Cobb) Thorne	Soybean, noncultivated	8, 14, 15, 17
<i>H. magnistylus</i> Robbins	Soybean	12, 17
<i>Longidorus elongatus</i> (deMan) Thorne & Swanger	Forest	This report
<i>L. diadecturus</i> Eveleigh & Allen	Hardwoods	This report
<i>Longidorus</i> spp.	Noncultivated	15
<i>Loofia gigas</i> (Thorne) Siddiqi	Noncultivated	15
<i>Meiodorus hollisi</i> Siddiqi	Soybean	14, 17
<i>Meloidogyne arenaria</i> (Neal) Chitwood	Noncultivated	8, 15
<i>M. graminis</i> (Sledge & Golden) Whitehead	Noncultivated	15
<i>M. hapla</i> Chitwood	Soybean, noncultivated	8, 14, 15
<i>M. incognita</i> (Kofoid & White) Chitwood	Soybean, noncultivated	8, 14, 15
<i>M. javanica</i> (Trueb) Chitwood	Noncultivated	15
<i>Meloidogyne</i> sp.	Forest	This report
<i>Merlinius brevidens</i> (Allen) Siddiqi	Noncultivated	15
<i>Nacobbus aberrans</i> (Thorne) Thorne & Allen	Noncultivated	15
<i>Nothocriconema</i> spp.	Noncultivated	15
<i>Ogma decalineatum</i> (Chitwood) Andrassy	Forest	This report
<i>Paratrichodorus minor</i> (Colbran) Siddiqi	Blueberry (<i>Vaccinium corymbosum</i> L.) soybean, noncultivated, peach	2, 8, 14, 15, 17, 20
<i>P. porosus</i> (Allen) Siddiqi	Noncultivated	8, 15
<i>Paratylenchus dianthus</i> Jenkins & Taylor	Bermudagrass	This report
<i>P. holdemani</i> Raski	Peach	This report
<i>P. projectus</i> Jenkins	Soybean, noncultivated	14, 15, 17
<i>P. tenuicaudatus</i> Wu	Soybean, noncultivated	14, 15, 17
<i>Peltamigratus christiei</i> (Golden & Taylor) Sher	Turfgrass	This report
<i>Pratylenchus agilis</i> Thorne & Malik	Bermudagrass	This report
<i>P. allenii</i> Ferris	Soybean, noncultivated	14, 15, 17
<i>P. brachyurus</i> (Godfrey) Filipjev & Sch. Stek.	Soybean, noncultivated	8, 14, 15, 17
<i>P. coffeae</i> (Zimmerman) Filipjev & Sch. Stek.	Strawberry	8, 11
<i>P. hexincisus</i> Taylor & Jenkins	Soybean, noncultivated	14, 15
<i>P. neglectus</i> (Rensch) Filipjev & Sch. Stek.	Soybean, noncultivated	14, 15
<i>P. penetrans</i> (Cobb) Filipjev & Sch. Stek.	Noncultivated	8, 15
<i>P. pratensis</i> (de Man) Filipjev	Alfalfa	This report
<i>P. scribneri</i> Steiner in Sherbakoff & Stanley	Soybean, noncultivated	14, 15, 17
<i>P. vulnus</i> Allen & Jensen	Soybean, noncultivated	8, 14, 15, 17
<i>P. zeae</i> Graham	Soybean, noncultivated	8, 14, 15, 17
<i>Punctodera punctata</i> (Thorne) Mulvey & Stone	Turfgrass	15
<i>Quimiusulcius acti</i> (Hopper) Siddiqi	Noncultivated	15
<i>Q. acutus</i> (Allen) Siddiqi	Soybean, noncultivated	14, 15, 17
<i>Rotylenchus</i> spp.	Noncultivated	15
<i>Rotylenchulus reniformis</i> Linford & Oliveira	Soybean	14
<i>Scutellonema brachyurum</i> (Steiner) Andrassy	Noncultivated	8, 15
<i>S. bradys</i> (Steiner & LeHew) Andrassy	Soybean, noncultivated	8, 14, 15, 17
<i>Seriespinula cobbi</i> (Micoletzky) Mekta & Raski	Forest	This report
<i>Sphaeronema whittoni</i> Sledge & Christie	Sweet gum	This report
<i>Trichodorus obscurus</i> Allen	Noncultivated	8, 15
<i>Trophonema arenarium</i> (Raski) Raski	Bermudagrass	This report
<i>Trophurus minnesotensis</i> (Caveness) Caveness	<i>Wisteria</i> sp., oak (<i>Quercus</i> sp.)	This report

TABLE 1. Continued.

Nematode	Association†	Reference
<i>Tylenchorhynchus agri</i> Ferris	Peach	This report
<i>T. annulatus</i> (Cassidy) Golden	Soybean, noncultivated	14, 15, 17
<i>T. canalis</i> Thorne & Malek	Soybean	17
<i>T. claytoni</i> Steiner	Noncultivated	8, 15
<i>T. dubius</i> (Butschli) Filipjev	Peach	8
<i>T. ewingi</i> Hopper	Soybean, noncultivated	14, 15, 17
<i>T. goffarti</i> Sturhan	Soybean, noncultivated	14, 15, 17
<i>T. maximus</i> Allen	Noncultivated	15
<i>T. nudus</i> Allen	Bermudagrass	This report
<i>Tylenchulus</i> sp.	Peach	21
<i>Xenocriconemella</i> spp.	Noncultivated	15
<i>Xiphinema americanum</i> Cobb	Soybean, noncultivated, blueberry, peach	2, 7, 14, 15, 17, 20
<i>X. bakeri</i> Williams	Noncultivated	8, 15
<i>X. californicum</i> Lamberti & Bleve-Zacheo	Forest	This report
<i>X. chambersi</i> Thorne	Soybean, noncultivated	8, 14, 15, 17
<i>X. krugi</i> Lordello	Noncultivated	This report
<i>X. rivesi</i> Dalmasso	Soybean, noncultivated	7, 8, 14, 15, 17
<i>X. tenuiculus</i> Lamberti & Bleve-Zacheo	Peach	This report
<i>Xiphinema</i> sp.	Noncultivated	15

Authorities for species were taken from Tarjan and Hopper (19), Norton et al. (8), and other sources such as the description of the species.

† Turfgrass = lawns or sports fields usually of mixed or unknown plants; noncultivated = abandoned fields or open areas with grasses, weeds, and brushy type vegetation; forest = mixed stands of several species of hardwood and softwood trees.

fort is warranted to continue to survey, identify, and document the occurrence of plant nematodes to help guide future research.

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