

RESEARCH NOTES—NOTAS DE INVESTIGACION

FUNGAL PARASITES OF SOME PLANT PARASITIC NEMATODES

B.R. Kerry and L.A. Mullen

Rothamsted Experimental Station, Harpenden, Hertfordshire AL5 2JQ, England.

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RESUMEN

Kerry, B.R., y L.A. Mullen. 1981. Parásitos fúngos de algunos nematodos fitoparásitos. *Nematropica* 11: 187-190.

Se estudió la patogenicidad de tres especies de hongos ficomicetos que atacan hembras de nematodos enquistadores, contra otros nematodos con hembras saculiformes. Los hongos fueron: *Nematophthora gynophila* Kerry y Crump, *Catenaria auxiliaris* (Kúhn) Tribe, y una especie Lagenidiacea no descrita. *Meloidogyne acronea* (Coetzee) resultó ser parasitado por *N. gynophila* y *Heterodera glycines* Ichinohe por los tres hongos. Sin embargo las hembras de: *M. javanica* (Treub.) Chitwood, *M. incognita* (Kofoid y White) Chitwood, *M. naasi* Franklin, *Tylenchulus semipenetrans* Cobb, y las de *Rotylenchulus reniformis* Linford y Oliveira no fueron atacadas.

Palabras claves adicionales: patología de nematodos enquistadores, hongos nematófagos, control biológico.

Three species of phycomycetous fungi have been reported attacking females of cyst-nematodes (4). These fungi infect females on roots by zoospores and rapidly (<7 days at 13°C) destroy the nematode, preventing cyst formation. One species, *Nematophthora gynophila* Kerry & Crump is a major parasite of the cereal cyst-nematode, *Heterodera avenae* Woll., and with *Verticillium chlamydosporium* Goddard prevents the nematode multiplying on susceptible hosts in many soils in Britain and elsewhere in Europe. *N. gynophila* appears to be an obligate parasite of females of *Heterodera* spp. and has been recorded only from soils infested with *H. avenae* and *H. schachtii* Schmidt. In laboratory tests other *Heterodera* spp. were parasitized but not *Globodera rostochiensis* (Woll.) Mulvey & Stone (5). The fungal parasite, *Catenaria auxiliaris* (Kúhn) Tribe occurs widely in soils infested with *H. schachtii* (8) and *H. avenae* (5); it has also been isolated from a laboratory culture of *G. pallida* (Stone) Mulvey & Stone (7) and a larva of the bark beetle, *Scolytus scolytus* F. (3). An undescribed lagenidiaceous fungus

was found parasitizing females of *H. avenae* in two soils and attacked *H. schachtii* in pot tests (6). None of these fungi has been cultured on artificial media. Because of the possible use of the fungi as biological control agents we have tested some other important nematode pests which produce saccate females to see if they are also susceptible. The nematodes tested are listed in Table 1.

Table 1. Numbers of juveniles of some plant parasitic nematodes added to their hosts, and females examined for nematophagous fungi.

Nematode species	Host	Numbers Added x 10 ³	Females Examined
<i>Heterodera glycines</i>	Soybean	4	376
<i>Meloidogyne acronea</i>	Sorghum	1	472
<i>M. incognita</i>	Tomato	3	422
<i>M. javanica</i>	Tomato	1	356
<i>M. naasi</i>	Barley	4	111
<i>Tylenchulus semipenetrans</i>	Citrus	4	206
<i>Rotylenchulus reniformis</i>	Cowpea	1	69

A sandy loam soil from Butt Close field on the Woburn Experimental Farm was sieved through a coarse screen and 42 pots were filled, and six planted with each of the host plants given in Table 1. The soil was known to contain the three species of fungus described above and *H. avenae* often failed to multiply on this site despite the continuous cropping with susceptible cereals. All pots were kept at approximately 20° C in the glasshouse except those containing citrus and sorghum which were grown at 25-30° C. After 10 days second-stage juveniles of the heteroderoid species and a mixture of juvenile stages of *Tylenchulus semipenetrans* Cobb and *Rotylenchulus reniformis* Linford & Oliveira were added around the host roots (Table 1). After 8 wk and at regular intervals thereafter females of *H. glycines* Ichinohe were washed off roots (1) whereas all other species were dissected from intact root systems. Females were cut open and examined for fungal parasites.

H. glycines was parasitized by *N. gynophila*, *C. auxiliaris* and the lagenidiceous fungus and all stages of the fungi were recovered from diseased females. Only about 10% of females were parasitized on any one sampling occasion but more detailed sampling than was done in this study is necessary to estimate the effects of parasitism on nematode numbers (6). Some females (ca 4%) of *Meloidogyne acronea* Coetzee contained hyphae of *N. gynophila* but no resting spores were found; the first time this fungus has been recorded in nematodes outside the genus *Heterodera*. *M. acronea* females on sorghum roots are usually exposed in the soil whereas *M. javanica* (Treub.) Chitwood

and *M. incognita* Kofoid & White are usually protected from parasitism within large galls. Juvenile stages of *H. avenae* within roots are not parasitized by *N. gynophila* (2). None of the females of the other nematode species was susceptible. A.A.F. Evans (pers. comm.), however, has found a parasite very similar to the lagenidiaceous fungus in females of *R. reniformis* in cultures at Imperial College, London.

Fungi which attack reproducing adults are more likely to reduce nematode populations than those killing infective juveniles in soil (4). The potential of such fungi for the control of nematode pests is being investigated.

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