

CHARACTERIZATION OF RENIFORM NEMATODE, ROTYLENCHULUS RENIFORMIS
LINFORD & OLIVIERA, 1940 (TYLENCHIDAE) FOR REGULATORY PURPOSES

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The purpose of this circular is to provide a morphological characterization of reniform nematode for use as a guide for identification or delineation of the species for regulatory purposes.

Reniform nematode parasitizes over 100 plants (Fig.1) and is considered a severe pest of cotton, soybean, and pineapples (4). Females are usually partially embedded in the root, (Fig. 2), but sometimes the entire body lies within the root. It could be considered a tropical and subtropical climate pest because it occurs commonly in large numbers in tropical Florida, Louisiana, Puerto Rico, Hawaii, Texas, and some Caribbean islands.

Regulatory Status: Reniform nematode is presently excluded from the states of Arizona and California. On August 1, 1985 Arizona will formally initiate a quarantine against this pest. Plant shipments from Florida to these states must be certified free of reniform nematode.

History: Reniform nematode was first observed in 1935 infecting cowpeas growing in a pineapple field on the Hawaiian island of Oahu (3). It was described in 1940 by Linford and Oliviera (3).



Fig. 1. Left: Lettuce seedlings stunted by reniform nematode. Right: Young reniform nematodes embedded in a root. (Courtesy C. M. Heald, USDA ARS, Weslaco, TX)

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Hosts: Some of the economically important host plants are presented in Nematology Circular No. 32 (4). Reniform nematode has been recovered from soil associated with the following nursery plants in Florida: Aegle marmelos (L.) Correa, Aglaonema sp., Aloe vera (L.) Burm. f., Amaryllis sp., Aphelandra sp., Aralia sp., Araucaria heterophylla (Salisb.) Franco, Bambusa sp., Begonia sp., Boehmeria nivea (L.) Gaud. Beaup., Brassaia actinophylla Endl., Brassica juncea (L.) Czerniak., Bucida buceras L., Carica papaya L., Casuarina sp., Chamaedorea elegans Mart., X Citrofortunella mitis (Blanco) J. Ingram & H. E. Moore, Citrus X paradisi Macfady., Codiaeum variegatum (L.) Blume var. pictum (Lodd.) Mull. Arg., Coffea arabica L., Colocasia sp., Crocus sp., Croton sp., Delonix regia (Bojer) Raf., Dieffenbachia maculata (Lodd.) G. Don, Dracaena deremensis Engl., Dracaena marginata Lam., Dracaena reflexa Lam., Dracaena surculosa Lindl., Epipremnum aureum (Linden & Andre) Bunt., Eremochloa ophiuroides (Munro) Hack., Eucalyptus sp., Euphorbia milii Desmoul., Ficus neriifolia Sm., Gardenia sp., Gerbera sp., Hemerocallis sp., Hibiscus rosa-sinensis L., Liquidambar styraciflua L., Liriope sp., Lysiloma bahamensis Benth., Mangifera indica L., Mentha sp., Merremia tuberosa (L.) Rendle, Monstera deliciosa Liebm., Murraya paniculata (L.) Jack, Nerium oleander L., Persea americana Mill., Persea borbonia (L.) K. Spreng., Pinus palustris Mill., Polyscias fruticosa (L.) Harms., Sabal palmetto (Walt.) Lodd. ex Schult. & Schult. f., Sansevieria cylindrica Bojer, Sansevieria trifasciata Prain., Sansevieria trifasciata Prain. 'Laurentii', Schefflera arboricola (Hayata) Merrill, Schinus terebinthifolius Raddi, Sesbania vesicaria (Jacq.) Ell., Solanum seaforthianum Andr., Spathiphyllum sp., Stenocarpus sinuatus (A. Cunn.) Endl., Stenotaphrum secundatum (Walt.) O. Kuntze, Syzygium cumini (L.) Skeels, Tagetes sp., Tecomaria capensis (Thunb.) Spach, Viburnum sp., Vitis rotundifolia Michx., Vriesea imperialis E. Morr. ex Bak., Zebrina pendula Schnizl.

Identification characterization:

MORPHOMETRICS AND RATIOS

Character	Morphometrics (um)			
	Mature Female	Juvenile Female	Male	Larva
Body length	(324-483)*520	300(321-432)510	332-497	(316-341)410
Stylet length	10-15	(16-20)21	9(14-18)	14-18
Excretory pore	80-90	72-90	75	no data
Spicule	absent	absent	16(19-21)25	absent
Gubernaculum	absent	absent	(7-9)14	absent
	Ratios and percent			
Alpha (body length/body width)	4-5	(19.3) 37	22(24.4) 34	20(20.5) 24
Beta (body length/esophagus length)	no data	2.1(3.1) 4.3	2.7(4.2) 4.8	3.5 (4)
Gamma (body length/tail length)	no data	11 (15) 18	11 (12) 19	12 (13) 16
Vulva %	68-73	67(72) 76	absent	absent

* Numbers inside parentheses indicate original description, numbers outside are from redescrptions

Mature Female: Body ventrally arcuate, obese, kidney-shaped, with a 5-8 mu spike-like tail process* (Fig. 1-D), lip region truncate, well sclerotized about 2/3 long as wide; neck contour irregular, thick annulated cuticle with 4 lateral incisures; vulva large with prominent lips, centrally, ventrally located; stylet well

developed; dorsal gland orifice one stylet length posterior to telorhabdion base*, metacarpus large spherical with well developed valves, anus distinct; gonad amphidelphic, ovaries irregularly coiled; eggs 70-118 long by 34-49 μ wide; deposited in a gelatinous matrix.

Male: Body vermiform slender (Fig. 1-A), lip region truncate, well sclerotized; about half as long as wide*; dorsal gland orifice about one stylet length posterior to stylet*; medium bulb and valve, stylet and posterior esophagus not as well developed as in female and juveniles* (Fig. 1-A,B);, one pair lateral caudal papillae present; caudal alae narrow, rudimentary*, extends almost to tail tip; spicule slender arcuate; cephalated, gubernaculum simple; testes single; out-stretched.

Juvenile female: Vermiform, stylet, metacarpus and valves, and esophagus well developed (Fig. 1-G,H), lip region truncate, well sclerotized about 2/3 as long as the width. Dorsal gland orifice one stylet length posterior to the stylet*; telorhabdions rounded, esophageal glands overlap intestine; vulva not prominent; tail tip conoid to bluntly conoid.

Larva: Vermiform (Fig. 1-EF) resembles juvenile female but stylet, metacarpus and valves, and esophagus are not as well developed; vulva absent; anus inconspicuous.

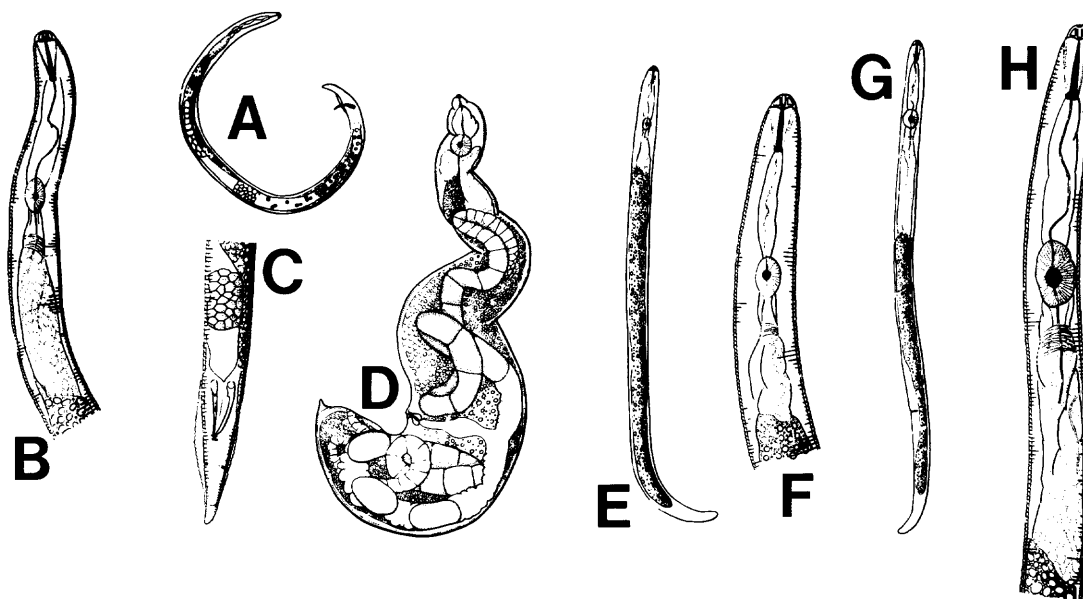


Fig. 2. Rotylenchulus reniformis. A. Male. B. Male anterior end. C. Male posterior end. D. Mature female. E. Young larva. F. Anterior end of young larva. G. Juvenile female. H. Anterior end of juvenile female. After Linford and Oliviera.

*Principal generic diagnostic characters

Control: Rotylenchulus is so ubiquitous in tropical Florida that it is almost impossible to keep groundbed plantings uninfested. To grow plants free from this pest they should be grown under a program of sanitation. Clean seeds or cuttings must be grown in pest-free media, in clean containers, on sanitized benches with at least 18" of air space between the ground and bench tops. Such plants must be manipulated with sanitized tools held by clean hands.

Florida distribution: County/Frequency of detection. Alachua/4, Brevard/3, Broward/16, Collier/1, Dade/116, Duval/2, Escambia/1, Gadsden/10, Glades/1, Hendry/2, Highlands/1, Hillsborough/14, Indian River/1, Jackson/1, Jefferson/2, Lake/2, Lee/1, Leon/1, Levy/1, Martin/1, Manatee/5, Marion/1, Monroe/2, Orange/7, Palm Beach/12, Pasco/6, Pinellas/3, St. Johns/1, St. Lucie/7, Sarasota/2, Walton/1, Volusia/4, and Wakulla/1.

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