RESEARCH NOTES

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Life History of *Pratylenchus vulnus* on Carrot Discs[1]

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Life history studies have been reported for only a few species in the genus *Pratylenchus* (1,2,6). Information is provided in this study on the life history of *P. vulnus* cultured in vitro.

Populations of *P. vulnus* originally obtained from walnut roots and thereafter propagated on carrot tissue in the laboratory were used as the source culture. Life history of the nematode was studied on carrot tissue. Carrots were prepared according to the method of Moody et al. (3) except that they were surface-sterilized for 30 minutes in 0.05% NaOCl. A single carrot disc was transferred to a sterile 150-ml glass jar. An earlier attempt at culturing the nematode on carrot discs in petri plates proved unsuccessful due to dehydration of the disc 16–17 days after inoculation. Nematodes were surface-sterilized in 133 ppm Aretan (Plant Protection Ltd., Yalding Kent, England) solution for 2–3 hours and subsequently in 200 ppm dihydrostreptomycin sulfate solution for 3–4 hours. Each of 50 carrot discs was inoculated with 8–12 dark-bodied, motile females, many of which were gravid, and 1–3 males. The discs were incubated in sealed containers at 26 C (5) and examined once or twice daily for a period of one generation of the nematode.

Observations were made from water and glycerine mounts of heat-killed individuals obtained from cultures harvested daily. The carrot disc and the inside of the jar were rinsed with 10 ml water and the rinse water was examined for developing nematodes. The carrot disc was then blended for 30 seconds in a semi-micro blender. The suspension was examined, filtered, the filtrate reexamined, and the residue placed on a Baermann funnel for 12 hours under intermittent mist. The life stages were distinguished primarily by shape, size, and position of the developing gonads. Other distinguishing characters used, although of lesser importance, included body length, greatest body width (GBW), width of lip region, and stylet length.

The first molt occurred in the egg. Emergent second-stage juveniles (L = 190–250 μm; GBW = 11–14 μm) with four-celled developing gonads 7–9 μm long and 5–6 μm wide were first observed 9 days after inoculation. The molt from second- to third-stage juvenile occurred 11 days after inoculation. The third-stage juvenile (L = 270–360 μm; GBW = 15–19 μm) was stouter and slightly longer than the second-stage juvenile and had a multicellular, oblong, developing gonad 16–34 μm long, 6–7 μm wide. The third molt began 14 days after inoculation and was completed by day 17. Sexes were first distinguishable by the length of the developing gonads which were 75 μm long in third-molt female juveniles and about 50 μm long in male juveniles. Fourth-stage juveniles (L = 410–650 μm; GBW = 18–24 μm) with developing gonads 143 μm long were developed 17 days after inoculation. Fourth-stage males showed the earliest sign of molting 17.5 days after inoculation. Molting of fourth-stage juveniles was completed by the 18th day. Twenty-six days after inoculation, mature females had laid one or two eggs; by 28 days, eggs were being produced in abundance.

Pratylenchus vulnus appears to have a life cycle similar in duration to *P. zeae* at 26 C,

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although at 30 C the respective cycles of *P. zeae* and *P. brachyurus* took 3 and 4 weeks (4). The results of this study should be confirmed by life cycle studies of *P. vulnus* in the intact plant.

Literature Cited

1. Graham, T. W. 1951. Nematode root rot of tobacco and other plants. South Carolina Agriculture Experiment Station Bulletin 390.

2. Hastings, R. J. 1939. The biology of the meadow nematode. Canadian Journal of Research, Section D, 17:39–44.

3. Moody, E. H., B. F. Lownsbery, and J. M. Ahmed. 1973. Culture of the root-lesion nematode *Pratylenchus vulnus* on carrot disks. Journal of Nematology 5: 225–226.

4. Olowe, T., and D. C. M. Corbett. 1976. Aspects of the biology of *Pratylenchus brachyurus* and *P. zeae.* Nematologica 22:202–211.

5. Towson, A. J., and Bert Lear. 1982. Effect of temperature on reproduction and motility of *Pratylenchus vulnus.* Journal of Nematology 14:602–603.

6. Zimmerman, A. W. P. 1898. Die nematoden der Koffiewortels. Deel 1. Mededeelingen Plantentium Buitenzorg 27:1–64.