

RESEARCH NOTES

Observations on the Emergence of *Heterodera iri* from the Egg¹

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Doncaster and Shepherd (1) reported that hatching of eggs of *Heterodera rostochienis* Woll. was preceded by larval movement, by purposeful and accurate stylet thrusts which cut a slit at the end of the egg shell, and by forward body thrusts of the larva which forced the slit open and allowed it to escape.

We crushed in distilled water 30 cysts of *H. iri* Mathews found in association with creeping bent grass, *Agrostis palustris* Huds. Ten eggs containing second-stage larvae from each of the 30 cysts were placed on concave microscope slides in water. The larvae moved in a circulatory manner for 2 h and then pushed the head against the ends of the eggs, but neither the heads of the nematodes nor the egg shells were notably distorted. No stylet activity was observed at any time during the hatching process.

Each larva was oriented in a double figure eight configuration with the head next to the tail at the same end of the egg (Fig. 1A). Emerging *H. iri* larvae appeared to rupture egg shells with the tail tip and they always emerged from the egg tail first and head last (Fig. 1).

Shepherd and Clark (2) suggested that *Heterodera* larvae have three behavior patterns prior to hatching. These are locomotory movement, exploratory stylet thrusting, and purposeful stylet thrusting. They reported that unless purposeful stylet thrusting takes place, hatching does not occur. Our observations, however, suggest that the stylet does not play a primary role in the hatching of *H. iri*. We did see pulsations of the median bulb prior to hatching, but we did not see emission of glandular secretions from the stylet. Admittedly such secretions would

be difficult to see. It is possible, therefore, that hatching of *H. iri* may be both a physical and enzymatic activity. We believe this is the first

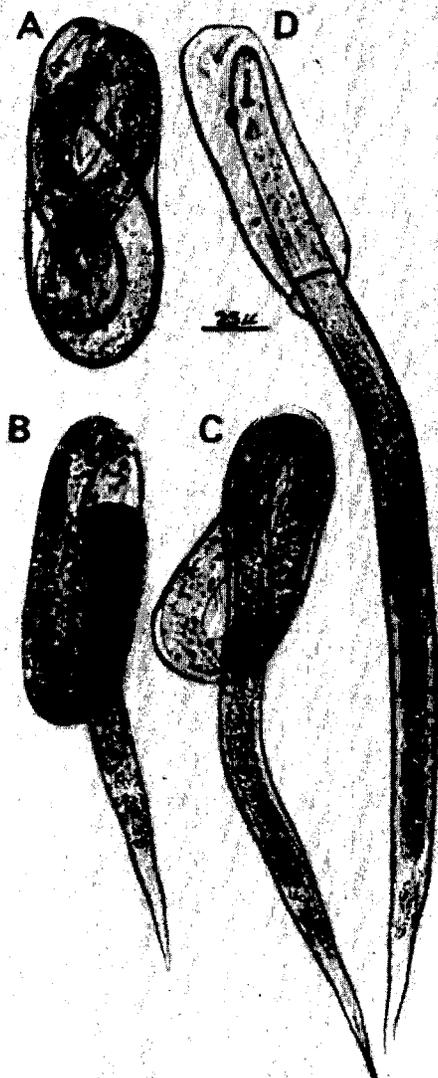


FIG. 1-(A to D). Photomicrographs of *Heterodera iri* hatching. A. Larva in double figure-eight configuration within the egg; B., C., and D. Stages in hatching with the tail tip emerging first and the head last.

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report of a plant parasitic nematode hatching tail-first.

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