Hatching of Tylenchorhynchus maximus and Merlinius icarus

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Tylenchorhynchus maximus Allen, 1955 and *Merlinius icarus* (Wallace and Greet, 1964) Siddiqi, 1970 were cultured on *Lolium perenne* L. seedlings growing in 1% sterile water agar in petri dishes. Seeds were dehusked and surface-sterilized in 2% sodium hypochlorite solution, washed three times in sterile water and germinated on sterile filter paper before being transferred to the water agar plates. Nematodes were washed three times in sterile water and hand-picked onto the plates containing the grass seedlings. Petri dishes were sealed with tape and kept at room temp. The final stages of embryonic development and emergence from the egg of both species were observed by transferring developing eggs from agar plates to thin squares of 1% water agar on microscope slides which were covered with coverslips and sealed with candle wax.

The parthenogenetic species, *T. maximus*, produced the most eggs; 15 females laid 95 eggs over a 19-day period along the roots on which they were feeding and on the surface of the agar. One nematode alone laid 14 eggs in the same period. *T. maximus* eggs hatched 17 - 19 days after being laid in the plates.

The final stages of development and hatching were similar for both species. Three days before hatching, fully formed larvae moved continually, performing figure-of-eight movements both forward and backwards as described by Wallace (9) for *Meloidogyne javanica*. The egg shells remained rigid until 12 h before hatching, when they softened and the eggs increased in size. Movements of the nematodes produced distortions of the elastic walls and distinct protrusions were caused by the nematodes pressing their heads against the end walls of the eggs. Prior to hatch, a nematode would

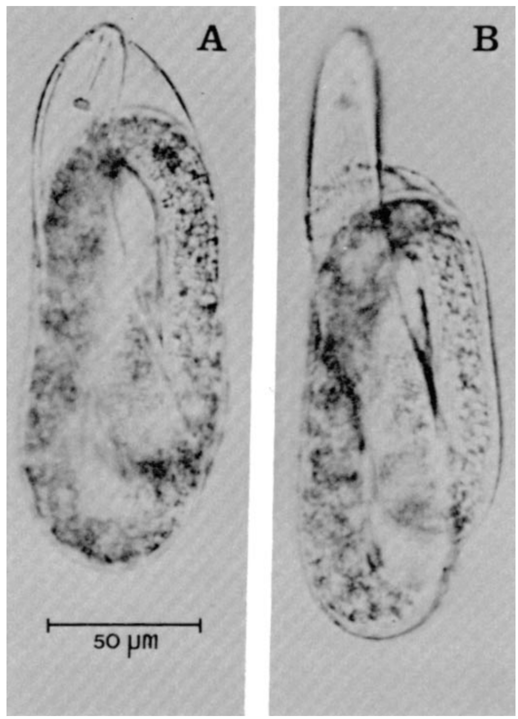

FIG. 1-(A,B). Hatching of *Merlinius icarus*. **A.** Softened egg shell bulging immediately prior to hatch. **B.** Larva emerging after rupturing the end wall.

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press its head at one point on the end wall (Fig. 1-A), begin thrusting its stylet until the stretched wall ruptured when punctured by the stylet and the larva emerged (Fig. 1-B).

The softening of the egg shell and the use of the stylet to rupture the shell is similar to the process described for *Aphelenchus avenae* (8), *Ditylenchus destructor* (1), *Meloidogyne arenaria* (5), *M. javanica* (2, 9), *T. dubius* (7) and *Pratylenchus penetrans* (3), although in the first two species it is uncertain whether stylet thrusts play an important part in the final emergence from the egg. In *Criconemoides xenoplax* (6) and *Trichodorus similis* (10) the stylet is not used to puncture the egg shell and any part of the egg may rupture at hatching. Hatching of *T. maximus* and *Merlinius icarus* differs from that of *Heterodera rostochiensis* which escapes from the egg by more purposeful and accurately directed stylet thrusts, resulting in a line of perforations and eventually a slit in the egg; the shell remains rigid throughout (4).

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