

NOTE BREVI - SHORT COMMUNICATIONS

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INTRA-UTERINE DEVELOPMENT  
OF EGGS IN *PRATYLENCHUS BRACHYURUS*

by

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« Endotoquia matricida » is a well documented phenomenon in the order Rhabditida (Maupas, 1898; Lordello, 1951; Wessing, 1953; Paetzold, 1958; Hirschmann, 1960; Scott and Whittaker, 1970; Lordello and Zem, 1977). The occurrence of intra-uterine development of eggs to the pre-hatch stage in the order Tylenchida has been reported for *Pratylenchus coffeae* (Cobb, 1920; Loof, 1959; Wehunt and Edwards, 1971); *Anguina tritici* (Ivanova, 1962; Gupta and Swarup, 1968); *Meloidogyne javanica* (Lordello and Koguti, 1962); *Radopholus similis* (Loos, 1962); *Aphelenchus avenae* (Jairajpuri, 1964); *Helicotylenchus paxilli* (Yuen, 1964); *Helicotylenchus* sp. (Yuen, 1964); *Helicotylenchus vulgaris* (Yuen, 1965); *Paranguina agropyri* (Krall, 1967); *Praecocilenchus raphidophorus* (Poinar, 1969), and *Pratylenchus minyus* (Vovlas and Inserra, 1975). The phenomenon has been noted also in the order Dorylaimida in an undescribed species of *Xiphinema* (Jatala, 1975).

This report refers to a single female of *Pratylenchus brachyurus* (Godfrey) Filipjev et Schuurmans Stekhoven recovered from the roots of rice, *Oryza sativa* L., collected from Iporá, Pr., Brazil, in which intra-uterine development of eggs was observed. Seven eggs were noted within the uterus, 3 eggs contained fully developed larvae and 4 eggs appeared undifferentiated. The uterus was greatly enlarged and the ovary displaced anteriorly, terminating in the region of the dorsal gland orifice. No free larvae were observed inside the body cavity. Unfortunately, the specimen had been placed in 5% formalin prior to examination and therefore subsequent development could not be observed.

This is the first report of endotoquia matricida in *P. brachyurus*, but represents the third species within the genus *Pratylenchus* to exhibit this phenomenon.

Intra-uterine development of eggs does not appear to be restricted to a particular mode of reproduction in *Pratylenchus*. Reproduction in *P. coffeae* is by amphimixis and *P. brachyurus* reproduces by mitotic parthenogenesis (Roman and Triantaphyllou, 1969). The mode of reproduction in *P. minyus* is unknown. The authors noted that endotoquia matricida has not been reported in nematodes with a meiotic parthenogenesis mode of reproduction.

It has been speculated that intra-uterine development of eggs is associated with the deterioration of reproductive muscles in older females (Hirschmann, 1960; Lordello and Zem, 1977); nutritional factors effecting the reproductive system (Wessing, 1953; Paetzold, 1958); environmental factors or damage to females (Loos, 1962) and a lack of the enzyme necessary to lyse the vulval plug (Scott and Whittaker, 1970).

Scott and Whittaker (1970) demonstrated that endotoquia matricida is genetically transmissible in *Pelodera strongyloides*. Through a continuous, selective breeding of sibling progeny recovered from live adult females with endotoquia, the frequency of this phenomenon increased from 1% to 25% of the population over a 9 month period.

The occurrence of natural populations of *Pratylenchus coffeae* (Wehunt and Edwards, 1971) and an unidentified species of Rhabditidae (Lordello and Zem, 1977) in which intra-uterine development of eggs was frequently observed, supports a genetic basis for this phenomenon.

Maggenti (1971) suggested that complex morphological specializations, as exemplified by the Heteroderidae, may have evolved from simpler forms. The authors postulate that endotoquia matricida, which occurs in diverse taxa of nematodes, may represent one stage in the evolutionary process toward the retention of eggs within the body of the female and subsequent sedentary swollen females.

#### LITERATURE CITED

- COBB N.A., 1920 - A newly discovered parasitic nema (*Tylenchus mahogani* n. sp.) connected with a disease of mahogany tree. *J. Parasitol.*, 6: 188-191.
- GUPTA P. and SWARUP G., 1968 - Occurrence of live adult males and second stage larvae inside live adult females of *Anguina tritici*. *Nematologica*, 14: 157.

- HIRSCHMANN H., 1960 - Fundamentals and recent advances with emphasis on plant parasitic and soil forms ». (In « Nematology » J. N. Sasser and W. R. Jenkins, eds.), Univ. of North Carolina Press, Chapel Hill, North Carolina, pp. 140-167.
- IVANOVA T. S., 1962 - The phenomenon of « Endotokia Matricida » in species of the eelworm genus *Anguina* Scopoli, 1777. *Izv. Akad. Nauk. Tadzh. SSR, OTD. Biol. Nauk*, 3: 99-101.
- JAIRAJPURI M. S., 1964 - Intra-uterine egg development in *Aphelenchus avenae*. *Nematologica*, 10: 183.
- JATALA P., 1975 - Endotokia matricida in a *Xiphinema* sp. *J. Nematol.*, 7: 205-206.
- KRALL E., 1967 - Occurrence of endotokia matricida in *Paranguina agropyri* with a note on the hibernation of this eelworm. *Nematologica*, 13: 466.
- LOOF P. A. A., 1959 - Über das Vorkommen von Endotokia Matricida bei Tylenchida. *Nematologica*, 4: 238-240.
- LOOS C. A., 1962 - Studies on the life - history and habits of the burrowing nematode, *Radopholus similis*, the cause of blackhead disease of banana. *Proc. helm. Soc. Wash.*, 29: 43-52.
- LORDELLO L. G. E., 1951 - Endotoquia matricida em *Rhabditis* sp. (Nematoda, Rhabditidae). *An. Esc. Sup. Agric. «Luiz de Queiroz»*, 8: 111-114.
- LORDELLO L. G. E. and KOGUTI S., 1962 - Ocorrência de Endotoquia matricida em *Meloidogyne javanica* (Nematoda, Heteroderidae). *An. Esc. Sup. Agric. «Luiz de Queiroz»*, 19: 305-308.
- LORDELLO L. G. E. and ZEM A. C., 1977 - Ocorrência de endotoquia matricida em um nematóide da família Rhabditidae. *Soc. Bras. Nemat. Publ. n. 2*: 41-43.
- MAGGENTI A. R., 1971 - In « Plant Parasitic Nematodes, Vol. I ». B. M. Zuckerman, W. F. Mai, and R. A. Rohde, eds.), Academic Press, New York, pp. 65-81.
- MAUPAS E., 1899 - La mue et l'enkystement chez les nématodes. *Arch. Zool. Exp. Gén.*, 7: 562-628.
- PAETZOLD D., 1958 - Bemerkungen zur « endotokia matricida » von Lordello 1951. *Wiss. Z. Martin Luther Univ. Halle-Wittenberg Math-Naturwiss Reihe*, 7: 81-83.
- POINAR G. O. JR., 1969 - *Praecocilenchus rhabdidophorus* n. gen., n. sp. (Nematoda: Aphelenchoidea) parasitizing *Rhynchophorus bilineatus* (Montrouzier) (Coleoptera: Curculionidae) in New Britain. *J. Nematol.*, 1: 227-231.
- ROMAN J. and TRIANTAPHYLLOU A. C., 1969 - Gametogenesis and reproduction of seven species of *Pratylenchus*. *J. Nematol.*, 1: 357-362.
- SCOTT H. L. and WHITTAKER F. H., 1970 - *Pelodera strongyloides* Schneider 1866: a potential research tool. *J. Nematol.*, 2: 193-203.
- VOVLAS N. and INSERRA R., 1975 - Embriogenesi intrauterina in *Pratylenchus minyus* Sher et Allen. *Nematol. medit.*, 3: 177-179.
- WEHUNT E. J. and EDWARDS D. I., 1971 - Intra-uterine egg development of *Pratylenchus coffeae* (Zimmermann Filipjev and Schuurmans Stekhoven). *J. Nematol.*, 3: 422-423.
- WESSING A., 1953 - Biologische Beobachtungen bei der Zucht des Regenwurmne-matoden *Rhabditis anomala* P. Hertwig. *Zool. Anz.*, 151: 28-38.
- YUEN P. H., 1964 - The female gonad in the subfamily Hoplolaiminae with a note on the spermatheca of *Tylenchorhynchus*. *Nematologica*, 10: 570-580.
- YUEN P. H., 1965 - Further observations on *Helicotylenchus vulgaris* Yuen. *Nematologica*, 11: 623-637.

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