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PARASITISM OF AGRIOTES OBSCURUS LINNEAUS (COLEOPTERA: ELATERIDAE) BY HEXAMERMIS SP. (NEMATODA: MERMITHIDAE)

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Records of nematode parasitism of elaterids are few. VAN ZWALUWENBURG (1928) reported that an elaterid pupa, probably *Monocrepidius* sp., was parasitized by an unidentified mermithid. Several genera of nematodes also have been found associated with dead elaterid larvae (KÖRNER 1954; VEREMCHUK 1962, 1969), but such associations are probably not the result of primary parasitism. Primary parasitism of *Agriotes lineatus* by the nematode *Neoplectana carpocapsae* was reported by POINAR & VEREMCHUK (1970). The different types of insect-nematode relationships were reviewed by WELCH 1963, 1965.

Nematodes, later identified as belonging to the mermithid genus *Hexameris*, were found parasitizing larvae of a wireworm, *Agriotes obscurus*<sup>2</sup> (Linnaeus). The wireworms, collected near Wädenswil<sup>3</sup>, Switzerland, during the autumn of 1970, were being reared for other studies when the nematodes emerged.

*A. obscurus* larvae collected 15 September were taken to the laboratory, held for 3 days at 6°C, and then 10 large larvae (about 20 mm) and 20 medium-sized larvae (about 13 mm) were placed in small plastic boxes filled with sieved soil and supplied with live wheat kernels for food. The larvae were examined two or three times a month and at these times provided with fresh soil and food. During the entire period of examination the larvae were held at approximately 22°C.

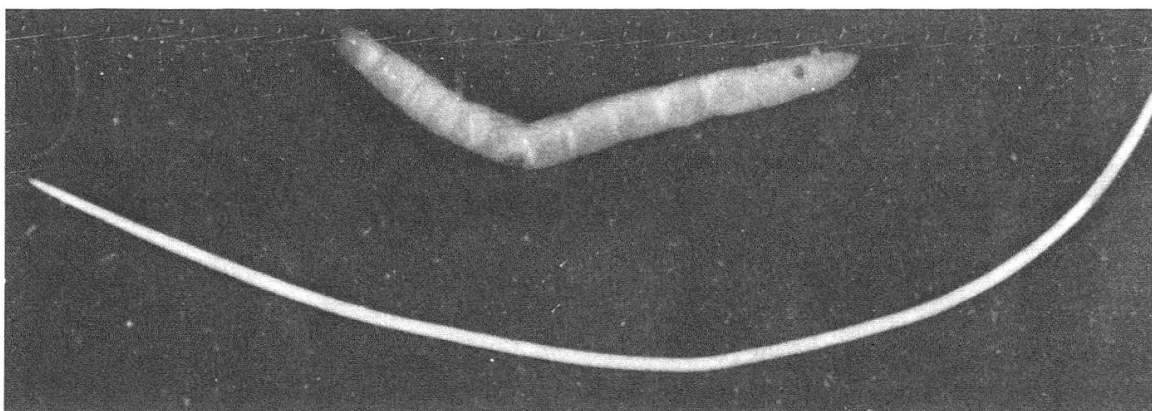


Fig. 1. *Agriotes obscurus* (Linnaeus) larva (actual size 13 mm) and a mermithid parasite (*Hexameris* sp.) that emerged from this larva.

Between 13 October and 19 December, 10 nematodes ranging in size from about 15 to 35 mm emerged from six of the medium-sized wireworms, an average of 1.7 per infected host. None emerged from wireworms longer than 14 mm. The numbers of nematodes per wireworm in the sample of 30 larvae were as follows: 0 nematodes in 22 larvae; 1 in 3; 2 in 2; 3 in 1. The per cent infection of the population sample of 30 wireworms was therefore 20 per cent, or if only the medium-sized larvae are considered, 30 per cent. Parasite emergence, which killed the host, appeared to take place through the mouth, anus or possibly the spiracles because no break in the integument could usually be found. However, in one case emergence was apparently through the intersegmental membrane between the second and third abdominal segments on the dorsum. After emergence the nematodes were heat relaxed in water on a cavity slide over a low flame, fixed in 4 per cent formalin and held for examination.

The feeding activity of the six parasitized wireworms did not seem greatly affected as compared to that of healthy larvae except perhaps within the 2-week period before parasite emergence. Even so, three of the parasitized larvae fed within 2 weeks of nematode emergence. During the last few days before parasite emergence parasitized wireworms became sluggish or quiescent, appeared thicker than normal, and resembled larvae about to moult. The apparent small effect of the nematode parasites on the feeding activity of the wireworms is consistent with the observation that mermithids do little damage to their hosts except shortly before parasite emergence (WELCH 1965).

Since parasites emerged from medium-sized wireworms 12–14 mm long apparently either a particular larval stage is attacked or the nematode infection tends to affect the growth rates of larvae so that they are all about equal size when the nematodes emerge.

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<sup>2</sup>Larvae of *A. obscurus* cannot be definitely separated from those of *Agriotes lineatus* (Linnaeus). However, because adults collected from this location were all *A. obscurus* the larval population probably contained no *A. lineatus* larvae.

<sup>3</sup>Coordinates of this location are: 693.375/299.300. (Kilometer-grid of Swiss national map).

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