THE PENETRATION OF *TRIPIUS SCIARAE* (BOVIEN) (SPHAERULARIIDAE: APHELENCHOIDEA) INTO ITS INSECT HOST, *BRADYSIA PAUPERA* TUOM. (MYCETOPHILIDAE: DIPTERA)

BY

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The occurrence and anatomy of the stage of *Tripius sciarae* that penetrates larvae and pupae of *Bradyisia paupera* are described. Infective, adult female nematodes produce an adhesive mass about their heads by digesting the front part of the unshed, last, larval cuticle. Adhering to their hosts by this, they use their spears and possibly also enzymes for penetration. The larval cuticle remains attached to the outside of the host by the adhesive mass which seals the penetration hole after entry.

*Tripius sciarae* was found in England during the Spring of 1964 in unidentified Mycetophilid fly larvae collected from soil samples and was cultured on *Bradyisia paupera*, a fly common in the Rothamsted glasshouses. The method whereby the eelworm penetrated the cuticle of the fly was studied in detail by filming.

**Materials and methods**

*B. paupera* was cultured in rearing chambers and the infective stage of *Tripius* was collected from soil containing parasitized fly larvae. A larva of *B. paupera* and five to fifteen infective larvae of *T. sciarae* were laid in a groove on one face of a small agar block. Movement of the fly larva was diminished by crushing the head capsule. The agar block was inverted on the coverslip base of an aluminium chamber 5 mm deep, sealed above by a second coverslip, and the preparation filmed from beneath with a ciné camera attached to an inverted microscope.

**The infective stage**

The infective stage of the nematode that penetrates the insect is the adult female enclosed in a second cuticle (probably that of the 4th stage larva) (Fig. 1C) and this adult female is mated through the outer cuticle before penetration. (Note the sperm cells in Fig. 1C).

As with some other nematodes parasitic on insects, the pharynx and the intestine are not connected, so that the pharynx and associated structures function only as organs of penetration.

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Infective females have a well-developed stylet and a non-muscular pharynx which leads back and divides into two lateral, distensible ducts leading to two equal salivary glands. These extend back to the tip of the ovary (Fig. 1). That

Fig. 1. a. Structure of infective female *T. sciarae*. A — lateral view of anterior region; B — dorso-lateral view of anterior region; C — lateral view of entire nematode. Scale line indicates 100 μ (A, B) and 50 μ (C).

* See list of abbreviations used in the Figures at the end of this paper.