PAPILLAE ASSOCIATED WITH THE SPINNERET IN SOME SOIL NEMATODES

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The caudal glands in nematodes open to the exterior through the spinneret at the tail tip either terminally or at times slightly subterminally (Chitwood & Chitwood, 1974). The spinneret may be a simple opening or may open at the end of a short, apparently cuticularized tube extending from the tail tip. Caudal glands appear to be primitive structures as they predominate in aquatic species and gradually disappear in the more evolved soil forms. According to Chitwood and Chitwood (1974) caudal glands are present in the suborders Chromadorina, Monhysterina and Enoplina which now correspond to the orders Chromadorida, Araeolaimida, Monhysterida, Enoplida and Mononchida. To date, caudal glands have not been reported in the species of the orders Tylenchida, Dorylaimida and Rhabditida.

During routine observations on *Tobrilus* sp., papillae-like structures were seen near the spinneret. As these structures had not been observed earlier, it was decided to make a comparative study.

Materials and methods

For SEM observations the nematodes were fixed in glutaraldehyde and post-fixed in osmium tetroxide, dehydrated in an alcohol or acetone series and critical point dried, using CO_2. They were coated with a 25-30 nm thick layer of gold and examined in a Hitachi S-2300 SEM at 15 kV. On an average 12-20 specimens of each species were examined except *Iotonchus* sp. where only three were available.

Observations

In *Tobrilus* sp. females the spinneret opens via a short curved cuticularized tube (Fig. 1 A). Surrounding the base of the tube are ten papillae (Fig. 1 B). They are about one micrometer long and spaced unevenly; the dorsal ones being more widely spaced than the laterals and ventrals. The tail tip of *Plectus* n. sp. (to be described by Tahseen, Ahmad and Jairajpuri) females (Fig. 1 C) resembles that of *Tobrilus* sp. in that the opening of the spinneret is at the end of a short tube. At the base of the spinneret tube are ten papillae almost evenly spaced (Fig. 1 D). The spinneret of females of *Mononchus aquaticus* Coetzee, 1968 is a cuticularized terminal pore not extending beyond the contour of the tail tip. The margins of the pore are well marked (Fig. 1 F). On the ventrosublateral sides of the tail tip are two prominent papillae (Fig. 1 E, F).

Not all species with caudal glands and spinneret had papillae at the tail tip. In *Mylonchulus minor* (Cobb, 1893) Andrássy, 1958 females, *Iotonchus* sp. females and *Thalassogenus* n. sp. (to be described by Ahmad *et al.*) females the spinneret is a simple invagination of the body cuticle at the tail tip, while in *Chromodorella* sp. it is on a small tube extending from the tail tip similar to *Plectus* sp. and *Tobrilus* sp. The spinneret of *Monhystera* sp. females opens terminally and in *Tobrilus paludicola* Micoletzky, 1925 females and males the tip tapers to a short spinneret tube. In none of these species was any papillae observed about the spinneret.

Discussion

From the information presented generalization is not possible but it appears that papillae associated with the tail tip may have a peri-spinneret arrangement (as in *Tobrilus* sp. and *Plectus* n. sp.) or may be limited to any particular sector (as in *M. aquaticus*). The arrangement of papillae around the spinneret appears to be restricted to those species where the spinneret opens at the end of a short tube. However, the presence of the spinneret tube does not necessarily imply that papillae will always

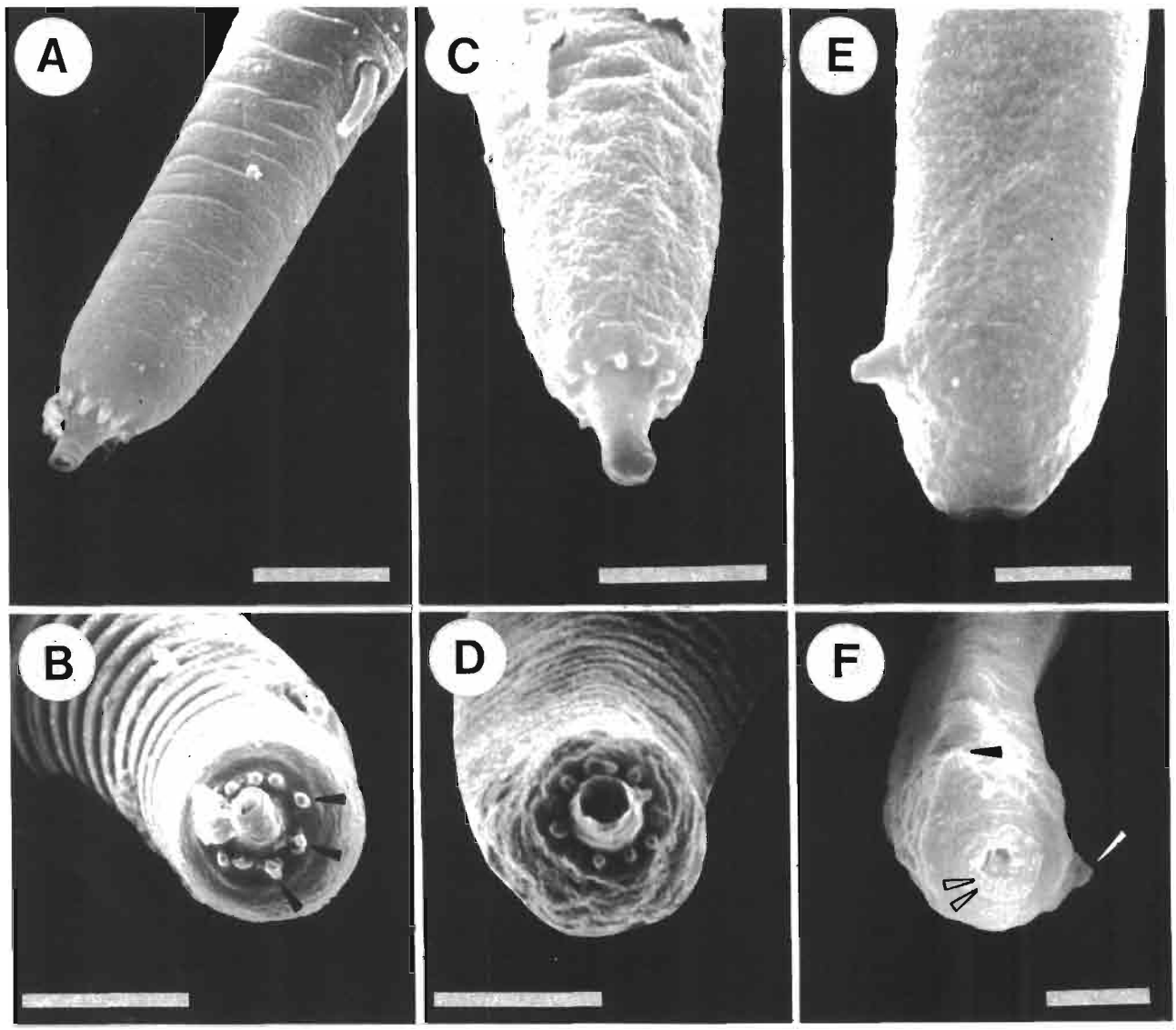

Fig. 1. Tail tips : A, B : *Tobrilus* sp. (arrows indicate papillae in dorsal sector); C, D - *Plectus* sp.; E, F - *Mononchus aquaticus*. Black and white arrows indicate the papillae on the ventrosublateral sector; half tone arrows indicate the margin of the spinneret. *(Scale bars = 3 μm).*

be present (e.g. *T. paludicola* or *Chromodorella* sp.). No papillae were observed in any of the five species of *Aphanolaimus* described by Raski and Coomans (1990). Generally where the spinneret is a simple invagination of the cuticle at the tail tip contour, the occurrence of papillae appears to be rare (seen only in *M. aquaticus*), and when present, their number is few. But whether the papillae of *M. aquaticus* on the one hand and *Plectus* n. sp. and *Tobrilus* sp. on the other are homologous structures is not certain and only detailed anatomical studies may provide the clue. Their close association with the spinneret, however, may suggest a common function probably of analysing the environment about the tail tip. Whether these papillae are chemo or mechano receptors can only be determined by TEM studies. From the point of view of functional relevance, the peri-spinneret papillae may not be of much importance as many species with caudal glands and spinneret lack them and they may be absent even in species of the same genus. They may, perhaps, represent a regressive character.

Acknowledgments

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