Nematol. medit. (1984) *12*: 163-168

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HEAD STRUCTURE OF FIVE SPECIES IN THE SUBFAMILY HOPLOLAIMINAE (NEMATODA)

by
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Several taxonomic contributions in the last ten years have shown intricate details which can be obtained by scanning electron microscope (SEM) photography of surface structures of nematodes. Such morphological characters frequently are useful in supplementing light microscope (LM) observations. In the present article a comparison of the head morphology of five hoplolaimid species is supplemented with additional comments on some taxonomic characters of the head region, which are difficult to interpret by LM because of resolution limits.

Materials and Methods

Specimens of *Rotylenchus laurentinus* Scognamiglio *et* Talamé, 1972, *Helicotylenchus multicinctus* (Cobb, 1893) Golden, 1956, *R. fallorobustus* Sher, 1965, *Hoplolaimus seinhorsti* Luc, 1958, and *Scutellonema unum* Sher, 1964 were killed, fixed in hot aqueous 4% formaldehyde plus 1% propionic acid and transferred to 1% osmium tetroxide for 12 hours and then infiltrated with Spurr's resin by the method of De Grisse (1973). Specimens mounted in glycerine were also used in this study. Nematodes were placed in an ethanol solution of glycerine (5% of glycerine) for 12 hours and then infiltrated with the ethanol-miscible Spurr's resin. All specimens, after gold coating

in a vacuum, were photomicrographed by SEM operating at an accelerating voltage of 5 kv.

Results and Discussion

The basic arrangement of the cephalic characters of adults in Hoplolaiminae species shown in Fig. 1 A is based on SEM observations of the genera *Rotylenchus, Helicotylenchus, Hoplolaimus* and *Scutellonema.*

The elliptical dorso-ventrally orientated opening to the prostoma is centrally located on the rounded or hexagonal cephalic plate (= oral disc), surrounded by the openings of the six inner labial sensilla (three on each side). The first head annule consists of six unequal sectors, two subventral, two subdorsal and two lateral sectors. The lateral sectors are generally slightly smaller than the subdorsal and subventral sectors. Two conspicuous ovoidal amphidial apertures are present between the lateral edges of the cephalic plate and the lateral sectors of the first head annule. Posterior to the first divided head annule the head is marked by a distinct annulation.

Description

Rotylenchus laurentinus (Fig. 1 B, C). Head hemispherical in profile with five annules and an oral disc. Anterior head annules with irregular longitudinal striations but basal annule divided into 22-28 regular rectangular segments. Centrally located on the hexagonal oral disc is the oval opening of the prostoma which is surrounded by the openings of the six inner labial sensillae (one arrowed in Fig. 1 C). The oral disc is clearly separated from the first head annule. Each amphid opening appears as a « half-ellipse » between the oral disc and the lateral sectors of the first annule.

Helicotylenchus multicinctus (Fig. 1 D, E). Lip region hemispherical in profile with four evident post-labial annules. The circular oral disc is slightly raised from the first head annule. The lateral sectors of the first annule are smaller than the subdorsal and subven-

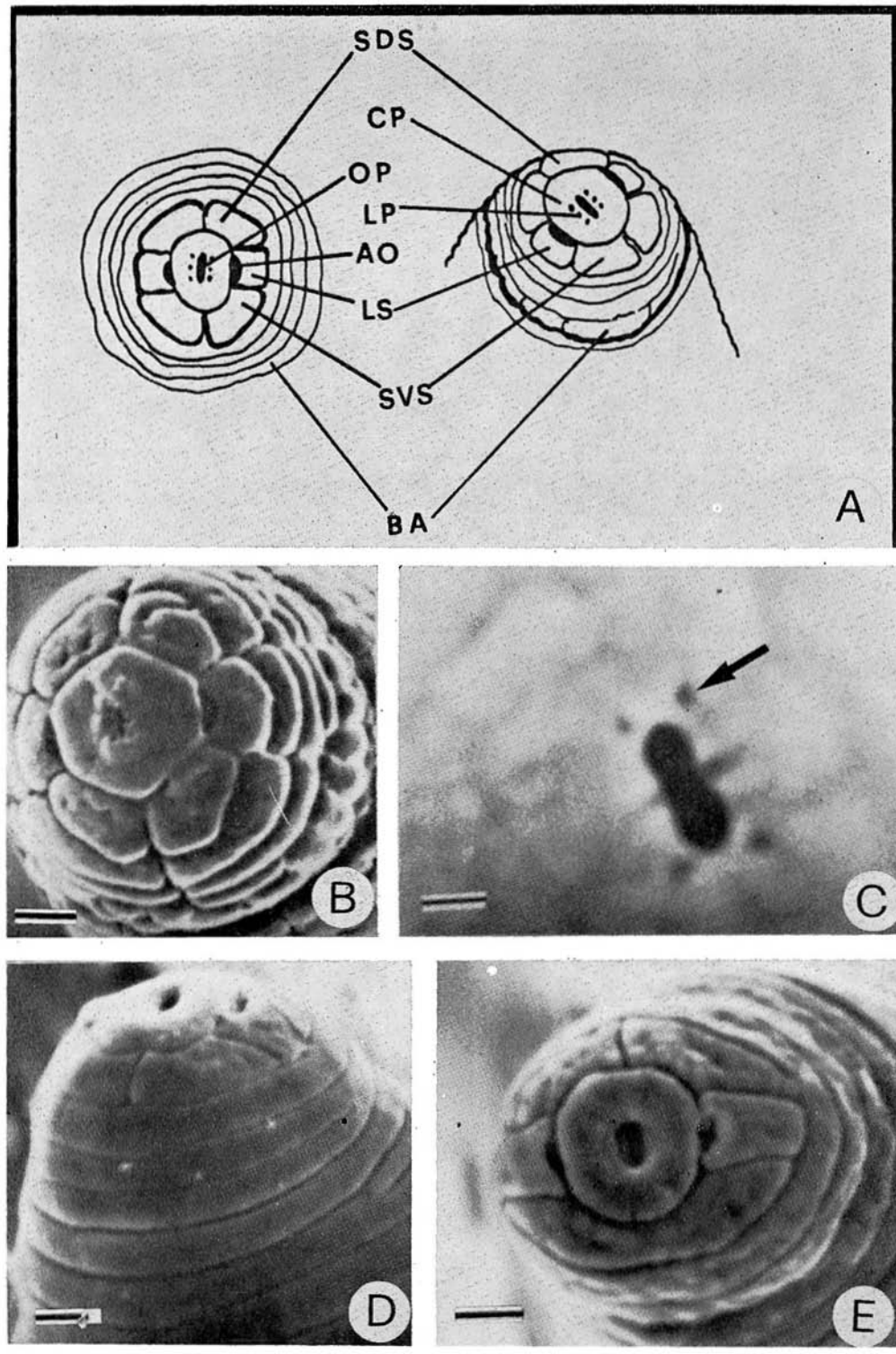

Fig. 1 - (A) Schematic illustrations of the head morphology within the Hoplolaiminae (AO = amphidial aperture; CP = oral disc; LP = openings of the inner labial sensilla; LS = lateral sectors of the first annule; OP = opening of the prostoma; SDS = subdorsal sectors of the first annule; SVS = subventral sectors). (B, C) SEM photomicrographs of *Rotylenchus laurentinus*. B) Female head region. C) Perioral area (labial sensillae arrowed). D, E) Head of *Helicotylenchus multicinctus*. D) Head in profile. E) Head en face view (Scale bar=2 μm).

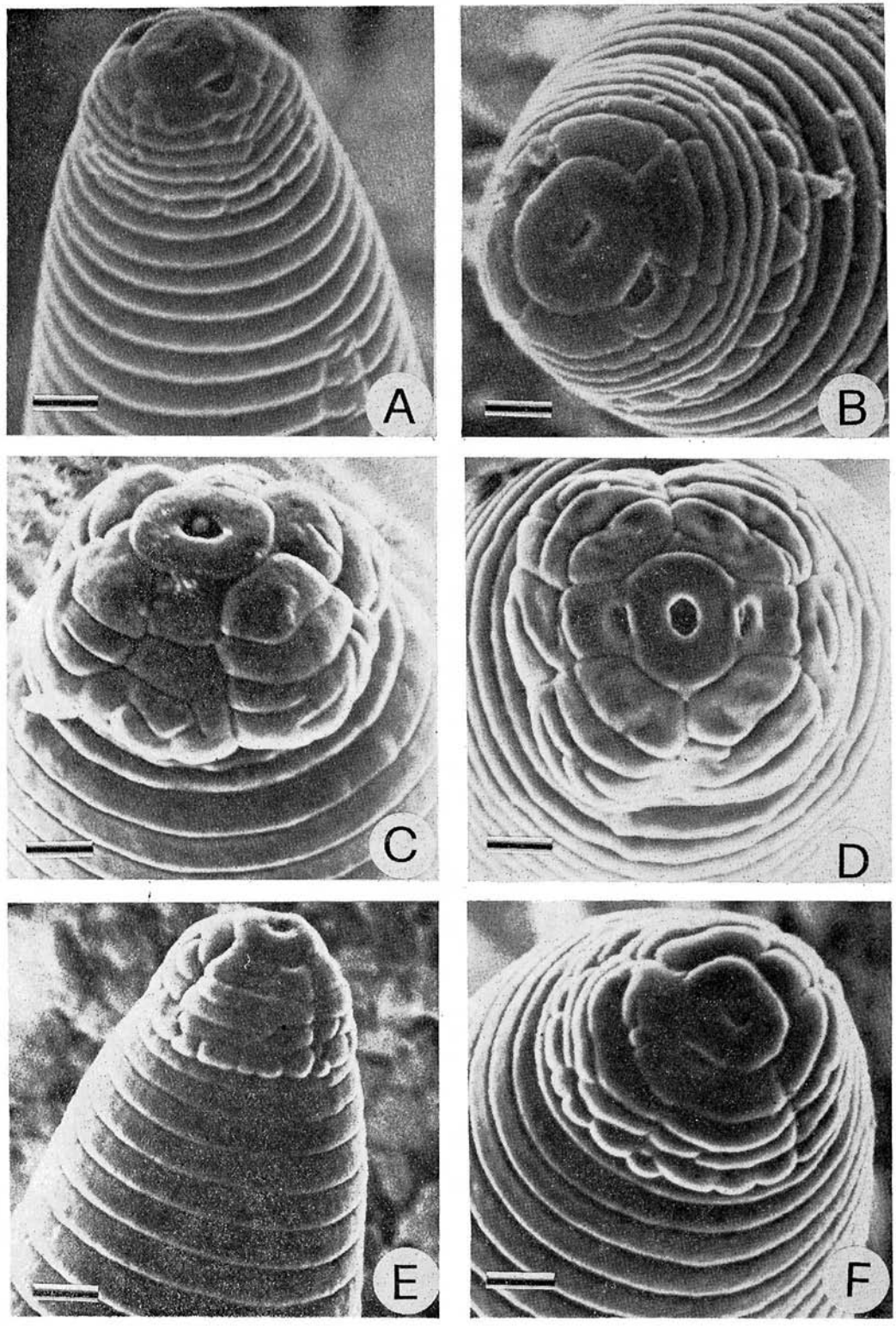

Fig. 2 - (A, B) Head of *Rotylenchus fallorobustus*. A) Head in profile. D) Head en face view. C) Head of *Hoplolaimus seinhorsti*. C) Head in profile. D) Head en face view. E) Head of *Scutellonema unum*. E) Head in profile, F) Head en face view (Scale bar=2 μm).

tral sectors. The ovoid amphidial apertures are located between the oral disc and the lateral sectors of the first annule.

Rotylenchus fallorobustus (Fig. 2 A, B). Head hemisperical in profile with six post labial annules. Anterior head annules with irregular longitudinal striations but basal annule divided into segments (18-22) by numerous longitudinal striations. Anteriorly the lateral field begins at the 7th-9th body annule.

Hoplolaimus seinhorsti (Fig. 2 C, D). Head region hemispherical 7-8 μm long, set off from the body by a distinct head constriction with a terminal disc and four post-labial annules. The head region is divided into two halves by a deep dorsal and ventral groove; each half is subdivided by shallower grooves that delimit the lateral sectors. Irregular longitudinal indentations are present on head annules giving a slightly four-lobed shape of the head with a tile-like surface appearance.

Scutellonema unum (Fig. 2 E, F). Lip region hemispherical slightly set off, bearing 4-5 post labial annules and a rounded oral disc. The basal head annule is subdivided into 20-24 unequal segments. Irregular longitudinal grooves also divide the head annules.

It is possible to observe slight differences in the shape of the cephalic structures within hoplolaimid species, particularly in the shape of the amphidial openings. These depend to some extent upon the protraction or retraction of the head at the time of nematode fixation. The fundamental arrangement of the hoplolaimid face view includes a rounded or hexagonal oral disc, an ovoidal opening of the prostoma, six (two subdorsal, two labial and two subventral) inner labial sensilla openings, six unequal sectors of the first head annule and 4-8 post-labial annules which can be more or less subdivided.

SUMMARY

The head structures of the Hoplolaiminae: *Helicotylenchus multicinctus, Hoplolaimus seinhorsti, Rotylenchus laurentinus, R. fallorobustus* and *Scutellonema unum* were compared by scanning electron microscopy (SEM). The structure of the head annules, shape and proportion of the oral disc and lip sectors of the first head annule, and the shape and position of amphidial apertures for each species are described and illustrated.

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Accepted for publication on 7 June 1984.