

# Scanning electron microscope observations on Telotylenchinae Siddiqi, 1960 (Nemata: Belonolaimidae). 4. New data on *Triversus festonatus* (Doucet, 1985) Fortuner & Luc, 1987

Pierre Baujard\*, Danamou Mounport\*\* and Marcelo E. Doucet\*\*\*

\*Muséum National d'Histoire Naturelle, Laboratoire de Biologie Parasitaire, Protistologie, Helminthologie, 61 rue Buffon, 75005 Paris, France,

\*\*Laboratoire de Biologie Animale, Faculté des Sciences, Université Cheikh Anta Diop, Dakar, Sénégal,

\*\*\*Laboratorio de Nematología, Centro de Zoología Aplicada, Universidad Nacional de Córdoba, Casilla de Correos 122, 5000 Córdoba, Argentina.

Accepted for publication 25 November 1997

**Summary.** Scanning electron microscope (SEM) observations on *Triversus festonatus* revealed the head morphology to be similar to that observed in two other species of the genus, *Triversus annulatus* and *Triversus triglyphus*. Preparation of a definitive description of the taxonomic limits of the genus *Triversus* requires SEM observations to be made of the two remaining species in the genus, *T. hollisi* and *T. hyalacus*.  
**Key words:** Telotylenchinae, *Triversus festonatus*, morphology, SEM.

The genus *Triversus* Sher, 1974 is comprised of the seven species, *T. annulatus* (Merny, 1964) Sher, 1974 (type species), *T. festonatus* (Doucet, 1985) Fortuner & Luc, 1987, *T. hollisi* (Siddiqi, 1976) Fortuner & Luc, 1987, *T. hyalacus* (Anderson & Ebsary, 1982) Siddiqi, 1986, *T. kangwonensis* Geraert, Choi & Choi, 1990, *T. triglyphus* (Seinhorst, 1963) Baujard, Mounport & Martiny, 1995, and *T. yugaensis* Geraert, Choi & Choi, 1990. With the exception of *T. hollisi* and *T. hyalacus*, the species have been examined by scanning electron microscopy (SEM) and are characterized by seven characters better appraised under by SEM: i) lip region continuous with body contour, ii) lip sectors not differentiated, iii) amphidial apertures circular, conspicuous, iv) body annulation sometimes coarse, v) female tail conoid, medium to long, with tip rounded to pointed, vi) lateral fields with two to three incisures, and vii) male caudal alae variable in shape, from trilobed to unlobed (Baujard *et al.*, 1995).

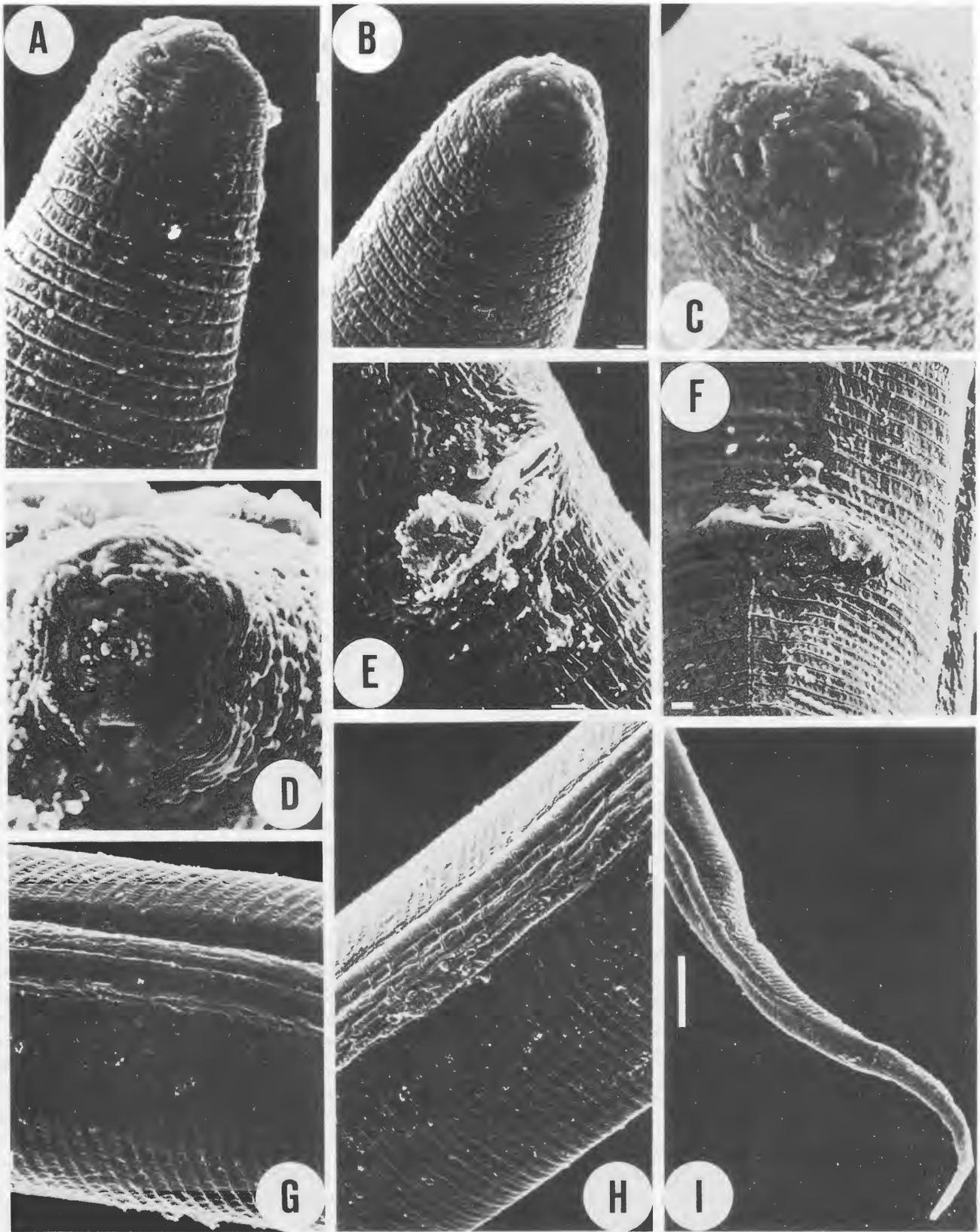
SEM observations (Baujard *et al.*, 1995) of *T. annulatus* cannot be compared with those of *T. festonatus* published by Doucet (1985) due to the poor quality of the photomicrographs of the latter species. Specimens of *T. festonatus* were collected from the type locality and new SEM observations were made of the external morphology of these nematodes.

## MATERIAL AND METHODS

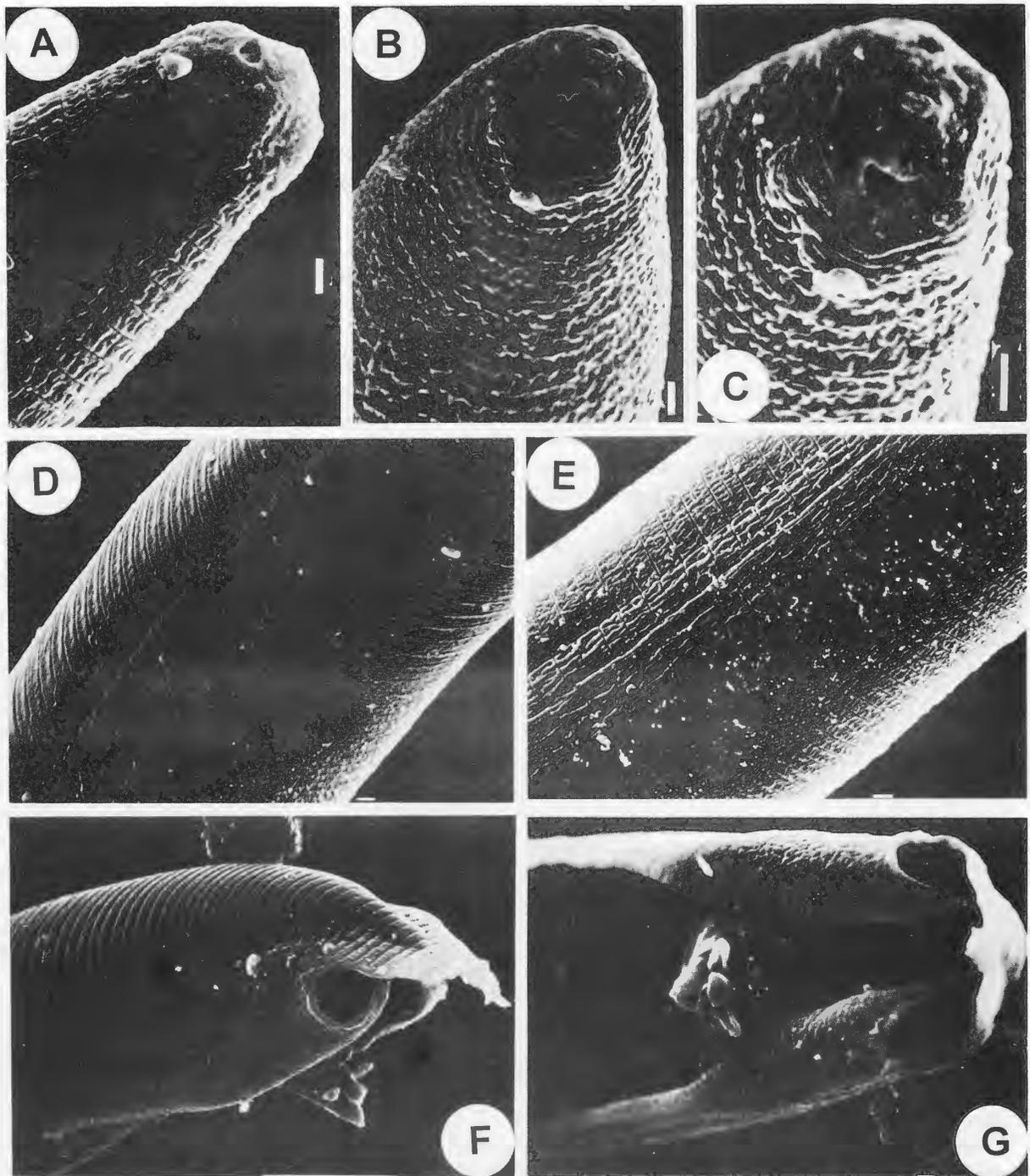
Five females and two males of *T. festonatus*, fixed in FP 4:1 (Netscher & Seinhorst, 1969) were prepared for SEM observations as described by Baujard and Pariselle (1987). The specimens were hand-picked and put into a micro-sieve; the micro-sieve was placed inside a glass tube (6.5 ml) with 0.5 ml of distilled water; the tube was placed in a dessicator filled with 500 ml of pure acetone and connected to a vacuum pump; the pump was run until the acetone began to boil; the dessicator remains closed until the acetone reached the bottom of the tube; after opening the dessicator, the micro-sieve was transferred to a new bath of pure acetone and then processed through critical point drying with CO<sub>2</sub>. Only three females and one male were suitable after critical point drying for observation by SEM. The specimens were gold-coated, an observations were made on a JEOL 35 CF at 10 kV acceleration voltage.

## RESULTS

Observation of the five female and two male *T. festonatus* by SEM revealed the head profile to be continuous with the body contour and six cephalic annuli were present (Figs. 1A & 2A). The labial disc is fused with the first cephalic annulus and the oral aperture is a small dorso-ventral slit surrounded by



**Fig. 1.** *Triversus festonatus*, females. A-D: Heads (B-C: Lateral and *en face* view, respectively, of the same specimen); E-F: Vulva; G-H: Lateral fields; I: Tail (Scale bar - 1 µm in A-H; 10 µm in I).



**Fig. 2.** *Triversus festonatus*, females (A-C, E) and males (D, F-G). A-C: Heads (A and B-C: Lateral and *en face* view, respectively, of the same specimen); D-E: Lateral fields; F-G: Tails (Scale bar - 1  $\mu\text{m}$  in A-E, G; 10  $\mu\text{m}$  in in F).

a small rim (circle of six labial sensilla?). A second circle of six more or less prominent protuberances are present as: two lateral, two subdorsal and two subventral (Figs. 1C-D & 2C). The amphidial aperture is close to the oral aperture (Fig. 2C) or more distant, close to the limit of the first cephalic annule

(Fig. 1C-D), triangular in shape and wide (0.8-1  $\mu\text{m}$  maximum width). Lip sectors are not demarcated. In one specimen, two slight transversal depressions were observed without definite limits, dorsally and ventrally, at the edge of the first annule (Fig. 2C).

Body annules 1.11-1.66  $\mu\text{m}$  in width (Figs. 1E-F,

2D-F), sometimes completely or incompletely subdivided into two narrower annules of 0.83  $\mu\text{m}$  width (Fig. 1G-H).

Vulva a transverse slit, with small protruding epiptygma (Fig. 1E-F).

Lateral fields composed of two regularly areolated bands, prominent or not (Figs. 1G & 2D-E), and in one specimen three bands were present (Fig. 1 H).

Female tail regularly conical, ending in a fine rounded terminus (Fig. 1I). Bursa enveloping the tail with two distal notches giving a trilobed appearance (Fig. 2F-G). Hypoptygma not observed. Gubernaculum protruding out of the cloaca with two distal, lateral and prominent apophysis (Fig. 2F-G).

## DISCUSSION

The pattern observed in the lateral fields of *T. festonatus* (subdivision of the body annules) has been observed by Geraert *et al.* (1990) in *T. kangwonensis* and *T. yugaensis*.

As in the topotype of *T. annulatus* (Baujard *et al.*, 1995) the pattern of lateral fields appears variable in *T. festonatus* with the number of incisures varying from two to three, probably in relation to the degree of "turgescence" of the wings of the lateral fields.

*En face* patterns of *T. festonatus* are identical to those described for *T. annulatus* by Baujard *et al.* (1995) and for *T. triglypus* (Seinhorst, 1963) Baujard *et al.*, 1995 by Sauer (1985), with the absence of a demarcated labial disc, presence of six more or less prominent tubercles around the oral aperture and wide amphidial apertures inside the limits of the first cephalic annulus. As reported by Baujard *et al.* (1995), these features are not present in *T. kangwonensis* Geraert *et al.*, 1990 or in *T. yugaensis* Geraert *et al.*, 1990. The face views of *Triversus* species observed by SEM are not clearly differentiated from

those of *Tylenchorhynchus* species belonging to group 1 of Baujard *et al.* (1994). Consequently, it is concluded that SEM observations of the two other species of the genus, *T. hollisi* (Siddiqi, 1976) Fortuner & Luc, 1987 and *T. hyalacus* (Anderson & Ebsary, 1982) Fortuner & Luc, 1987 are necessary to provide a definitive description of the taxonomic limits of the genus *Triversus*.

## REFERENCES

- Baujard, P., Mounport, D. & Martiny, B. 1994.** Scanning electron microscope observations on the Telotylenchinae Siddiqi, 1960 (Nemata: Belonolaimidae). 3. The genus *Tylenchorhynchus* Cobb, 1913. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Biologie* 64: 17-42.
- Baujard, P., Mounport, D. & Martiny, B. 1995.** Scanning electron microscope observations on the Telotylenchinae Siddiqi, 1960 (Nematoda: Belonolaimidae). 2. The genus *Triversus* Sher, 1974. *Systematic Parasitology* 30: 31-37.
- Baujard, P. & Pariselle, A. 1987.** Fabrication de microtamis et préparation des nématodes pour l'observation au microscope électronique balayage. *Revue de Nématologie* 10: 477-481.
- Doucet, M.E. 1985.** A new species of *Meiodorus* Siddiqi, 1976 (Nematoda: Tylenchida) from Córdoba, Argentina. *Revue de Nématologie* 8: 53-57.
- Geraert, E., Choi, Y.E. & Choi, D.R. 1990.** New tylenchs (Nematoda) from Korea. *Nematologica* 36: 273-291.
- Netscher, C. & Seinhorst, J.W. 1969.** Propionic acid better than acetic acid for killing nematodes. *Nematologica* 9: 286.
- Sauer, M.R. 1985.** *A Scanning Electron Microscope Study of Plant and Soil Nematodes*. C.S.I.R.O., Division of Horticultural Research. 64 pp.

---

**Baujard P., Mounport D., Doucet M. E.** Исследование Telotylenchinae Siddiqi, 1960 (Nemata: Belonolaimidae) в сканирующем электронном микроскопе. 4. Новые данные по *Triversus festonatus* (Doucet, 1985) Fortuner & Luc, 1987.

**Резюме.** Изучение *Triversus festonatus* в сканирующем электронном микроскопе показало, что морфология головного конца этого вида сходна с таковой у двух других видов рода: *Triversus annulatus* и *Triversus triglyphus*. Для подготовки окончательной ревизии этого рода необходимо исследование в СЭМ двух остающихся неизученными видов: *T. hollisi* и *T. hyalacus*.

---