Nematol. medit. (1984), *12*: 47-52.

Istituto di Nematologia Agraria, C.N.R., Bari, Italy

MORPHOLOGICAL OBSERVATIONS ON TWO PLANT NEMATODES: *PRATYLENCHOIDES LATICAUDA* AND *ROTYLENCHUS QUARTUS*, WITH THE SCANNING ELECTRON MICROSCOPE

by
N. VOVLAS [1]

About 500 soil samples were collected during a nematode survey made in 1983 in northern Italy, several of which were found to contain specimens of *Pratylenchoides laticauda* Braun *et* Loof, 1959 and *Rotylenchus quartus* (Andrassy) Sher, 1959. There are no morphological studies of these two species based on observations with the Scanning electron microscope (SEM). External morphological characters as seen by SEM, particular of the head, and cuticular structures, are described in this article.

Materials and Methods

The specimens used in this study were collected from the rhizosphere of unidentified grasses grown in vineyards and apple orchards at Burgresi (Bolzano) and Lavis (Trento), respectively. Nematodes were extracted from the soil by Cobb's sieving and decanting method, killed and fixed in hot aqueous solution of 4% formaldehyde plus 1% propionic acid. Several specimens, after this fixation, were transferred to 1% osmium tetroxide (OsO_4) solution for 12 hours and then infiltrated with Spurr's resin by the method of De Grisse, 1973. Glycerine mounted specimens were also used in this study. These nematodes

[1] The author thanks Mr. S. Landriscina for its technical help during the nematode survey.

were placed in ethanol solution of glycerine (5%) for 12 hours, then rinsed several times with ethanol, and then infiltrated with the ethanol-miscible Spurr's resin. All specimens, after vacuum gold coating, were observed by SEM at an accelerating voltage of 5 kv and microphotographed.

Morphology

Pratylenchoides laticauda. Female. Lip region hemispherical in profile, 3.5-4.0 µm long with four distinct post labial annules, and slightly or not set off (Fig. 1A) from the body, with a cephalic plate (= oral disc) which has two subdorsal, two lateral and two subventral lip sectors (Fig. 1B). Oval-shaped amphidial openings (often covered by « mucus ») located between the lateral sectors and the lateral edges of the labial disc. Oral opening oval and dorsoventrally oriented. Body annules distinct, being 1.2-1.4 µm wide at mid-body. Lateral fields, which have six incisures (7-8 µm wide) are about one third of the body width, forming 5 bands incompletely areolated. Areolations of the external bands, when present, are spaced from one to six annules apart (Fig. 1D). Lateral field in the posterior part of the body shows 4 incisures (Fig. 1C). Anal opening on the 19th-23rd annule from tail terminus appears, in ventral view, as a circular pore half the weight of an annule (Fig. 1E). Tail with 19-23 annules, and a broadly rounded terminus crossed by 5-6 irregularly spaced striae. Pore-like phasmidial opening (arrowed in Fig. 1E) occurs 19-21 µm from tail terminus, 14-16 annules behind the anus, and between the two inner incisures of the lateral field.

Male: Head, lateral fields and other cuticular ornamentations of male are similar to those of the female. Well developed caudal alae, which begin 15-18 annules anterior to cloaca, are long, about twice the tail length, with distinct annulation, and protrude ventrally half a body width at the cloacal level (Fig. 1F, G). The « cloacal tube » is short, posteriorly directed and is situated at 38-40 µm from terminus. The « cloacal tube » opening is ovoidal and with an unstriated anterior and a bilobate posterior margin (Fig. 1G).

Remarks. The Italian specimens correspond well with the original description of the species by Braun *et* Loof, 1966. The only additional

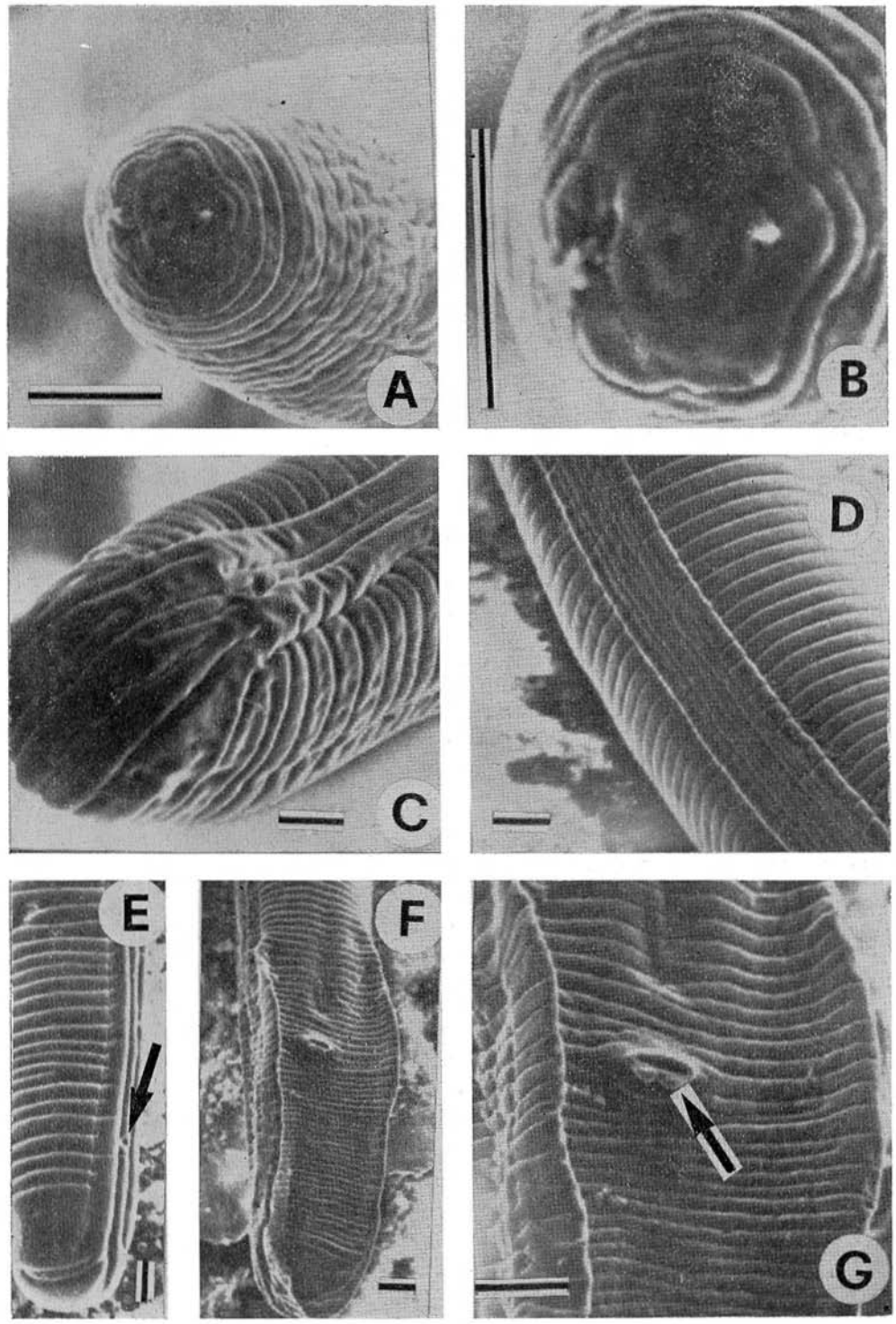

Fig. 1 A-G - SEM photomicrographs of *Pratylenchoides laticauda*: A, B, en face view of head region; C, female tail; D, lateral field at mid-body; E, ventro-lateral view of tail (phasmid arrowed); F, male posterior region; G, male anal area (posterior lips of cloacal opening arrowed). (Scale bar = 5 μm).

characters, beside those already reported for this species, are the hexaradiate pattern of the cephalic plate on female and male and the presence of a short « cloacal tube » in males.

Rotylenchus quartus. *Female*. Lip region hemispherical in profile with seven annules, an oral disc and slightly or not set off. Anterior head annules with irregular longitudinal striations, but without longitudinal striations on the basal annule (Fig. 2A). The oval opening of the prestoma is centrally located on the rounded oral disc, which is clearly separated from the first head annule. The lateral sectors of the first head annule are slightly smaller than the subdorsal and subventral sectors. Small amphidial openings are present between the oral disc and the lateral sectors of the first head annule (Fig. 2A). The lateral fields have four equidistant lines approximately one fourth as wide as the body width (Figs 2C, D). Anteriorly the field begins at the 8th-10th body annule as three lines (Figs 2A, B) forming two bands; beyond a further other 6-8 annules the central line divides to form a third band. Regular areolation on the lateral field present only on the anterior part of the body. A rectangular anterior epiptygma is present, covering the vulva aperture overlapping a less conspicuous posterior epiptygma. Anal opening located at the 9th-11th body annule from the tail terminus and 5-7 annules anterior to the end of the lateral field (Fig. 2F). Tail hemispherical, dorsally more curved with 12-14 annules with 2-3 smaller terminal annules which do not connect with the lateral fields. Phamids 2-3 annules anterior to anus.

Male: The head, lateral fields, and other cuticular ornamentations of the male similar to those of the female. Caudal alae distinctly annulated, extended twice the tail length, and protruded ventrally one body width at the anal level (Fig. 2G).

Remarks. The Italian specimens of *Rotylenchus quartus* correspond well with the Austrian specimens illustrated by Sher, 1965. Males seem to be abundant in the Italian population. The only differences noted between the Italian and previously described populations of *R. quartus*, are the anterior position of phasmids (2-3 annules anterior to anal level vs. on tail) and the number of tail annules (10-12 vs. 12-16) that are not considered to be of particular taxonomic significance.

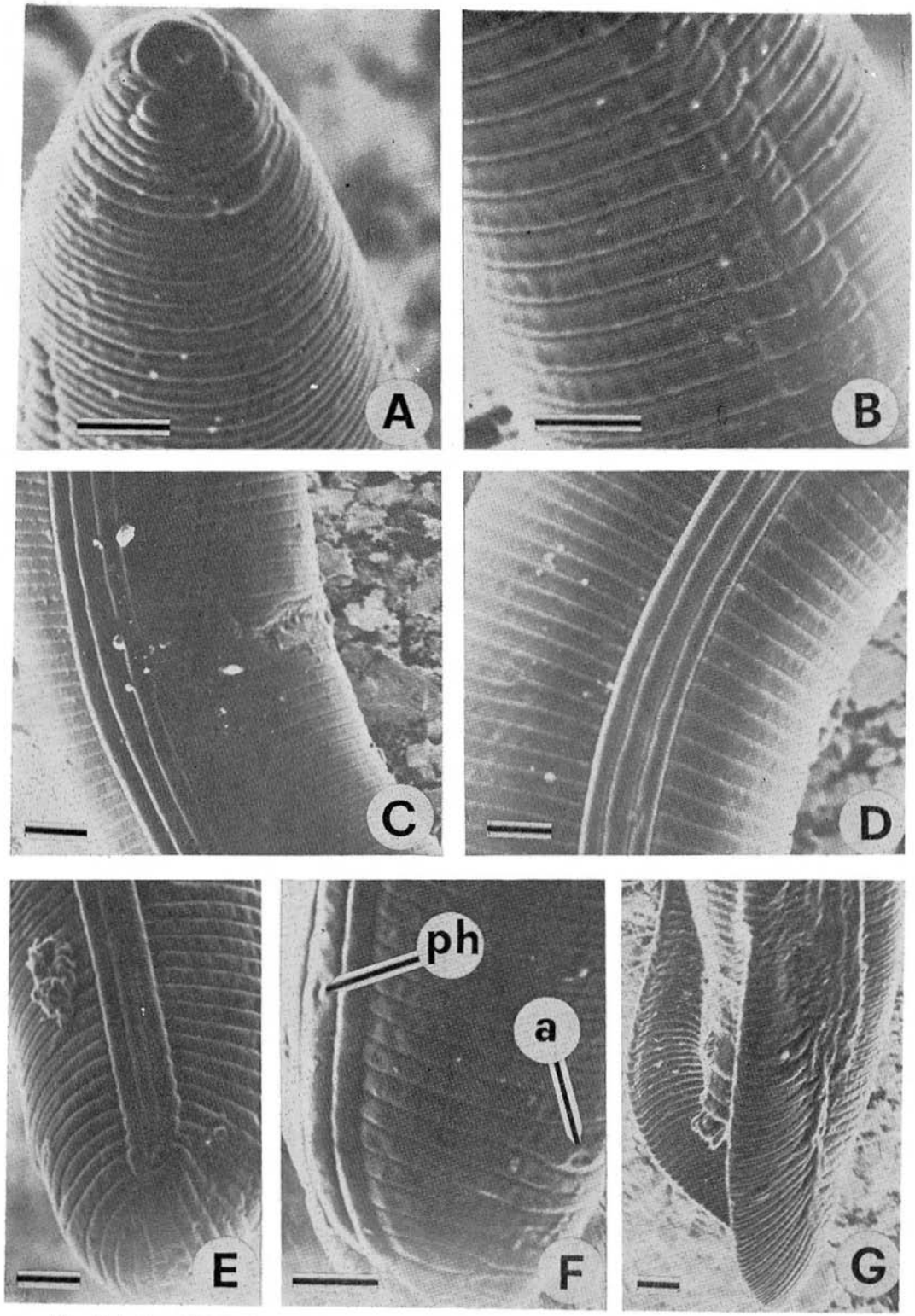

Fig. 2 A-G - SEM photomicrographs of *Rotylenchus quartus*: A, anterior body portion; B, lateral field of the anterior region; C, latero-ventral view of vulval area; D, lateral field at mid-body; E, F, lateral and ventral view of female tail (Ph = phasmid; a = anus); G, latero-ventral view of male posterior region. (Scale bar = 5 μm).

SUMMARY

Details of head and cuticular structures of Italian populations of *Pratylenchoides laticauda* Braun *et* Loof and *Rotylenchus quartus* (Andrassy) Sher are illustrated with scanning electron photomicrographs. These two plant parasitic nematode species are widespread in vineyards and apple orchards of northern Italy.

LITERATURE CITED

BRAUN A. L. and P. A. A. LOOF, 1966 - *Pratylenchoides laticauda* n. sp. a new endoparasitic phytonematoda. *Neth. J. Plant Path.*, *72*: 241-245.

DE GRISSE A., 1973 - A method for preparing nematodes and other soft tissues for SEM. *Meded. Fac. Landbwet. Riiksuniv., Gent*, *38*: 1685-1703.

SHER S. A., 1965 - Revision of the Hoplolaiminae (Nematoda). V. *Rotylenchus* Filipjev, 1936. *Nematologica*, *11*: 173-198.

Accepted for publication on 16 September 1983.