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DITYLENCHUS LEPTOSOMA SP. N. (NEMATODA: TYLENCHIDA), A PARASITE OF CARPINUS LEAVES IN KOREA

by

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Summary. *Ditylenchus leptosoma* sp. n. is described and illustrated from the leaves of *Carpinus laxiflora* in Korea. It is characterized by its very thin body, the structure of the lateral field (mainly two lines) and the en face view (two groups of three lips). It invades and damages the leaves of its type host.

The second author while investigating a diseased *Carpinus* tree, found that the leaves contained long, but very thin nematodes. These nematodes resembled *Ditylenchus* species; but in addition to their thinness, also the structure of lateral field and lip region was unusual. The possibility of erecting a separate genus for this nematode was considered but not pursued because too many other characteristics typical for *Ditylenchus* species were also present in this species.

Materials and methods

Infected leaves were collected from a 20 year old *Carpinus laxiflora* tree at Bulguk Temple Garden in Kyungju, Korea. They were cut into small pieces and the nematodes were extracted by the Baermann funnel method, and processed to glycerine by the de Grisse (1965) method.

Some fixed material was processed for scanning electron microscopy (SEM) using the method described in Luc *et al.* (1987).

DITYLENCHUS LEPTOSOMA sp. n. (Figs 1 and 2)

Measurements

Holotype ♀: L = 905 µm; width = 12.5 µm; a = 72.5; oesophagus = 186 µm; b = 4.9; tail = 60 µm; c = 15.2; V = 76%.

Paratype ♀♀ (n = 5): L = 775-930 µm; width = 11-12.5 µm; a = 70-81; oes = 164-197 µm; b = 4.5-5.3; tail = 54-71 µm; c = 12.5-15.5; V = 74-80%.

Paratype ♂♂ (n = 5): L = 845-930 µm; width = 12-13 µm; a = 69-71; oes = 162 µm; b = 5.2; tail = 32-47 µm; c = 19-27; T = 70-84%.

Description

Body long and very thin, almost straight except for the posterior region which is often ventrally curved. Cuticle thin, delicately annulated, annuli 0.6-1 µm wide. Lateral field with two distinct border lines 2.5-3 µm from each other; in between, the light microscope (LM) shows some intermittent faint lines; SEM shows some faint longitudinal striae in an irregular pattern, about eight striae being the maximum.

Head flattened, 1.5-2 µm high and 4-5 µm wide, not offset; striae not visible with LM but SEM shows, apart from the labial area, two broken, discontinuous head annuli. En-face study with LM and SEM shows that the six lips are separated in two groups of three. Outline of the labial area hexagonal; the head annuli that follow show the lateral region slightly more outward. Mouth aperture (less than 0.2 µm), surrounded by six, even smaller, openings often blurred by an exudate. Mouth aperture and these six inner labial sensillae on an oral disc of about 1 µm diameter. The two groups of three lips each are well separated from the oral disc. Outer labial sensillae also are probably pores on the inner side of the lips; four cephalic sensillae on the outer side of the submedian lips. Amphidial apertures not distinct, but slightly oblique lines could be discerned on some photographs. LM indicates only the position of the four cephalic sensillae and of the two amphidial

¹ This paper was supported by Non Direct Research Fund, Korea Research Foundation, 1990.

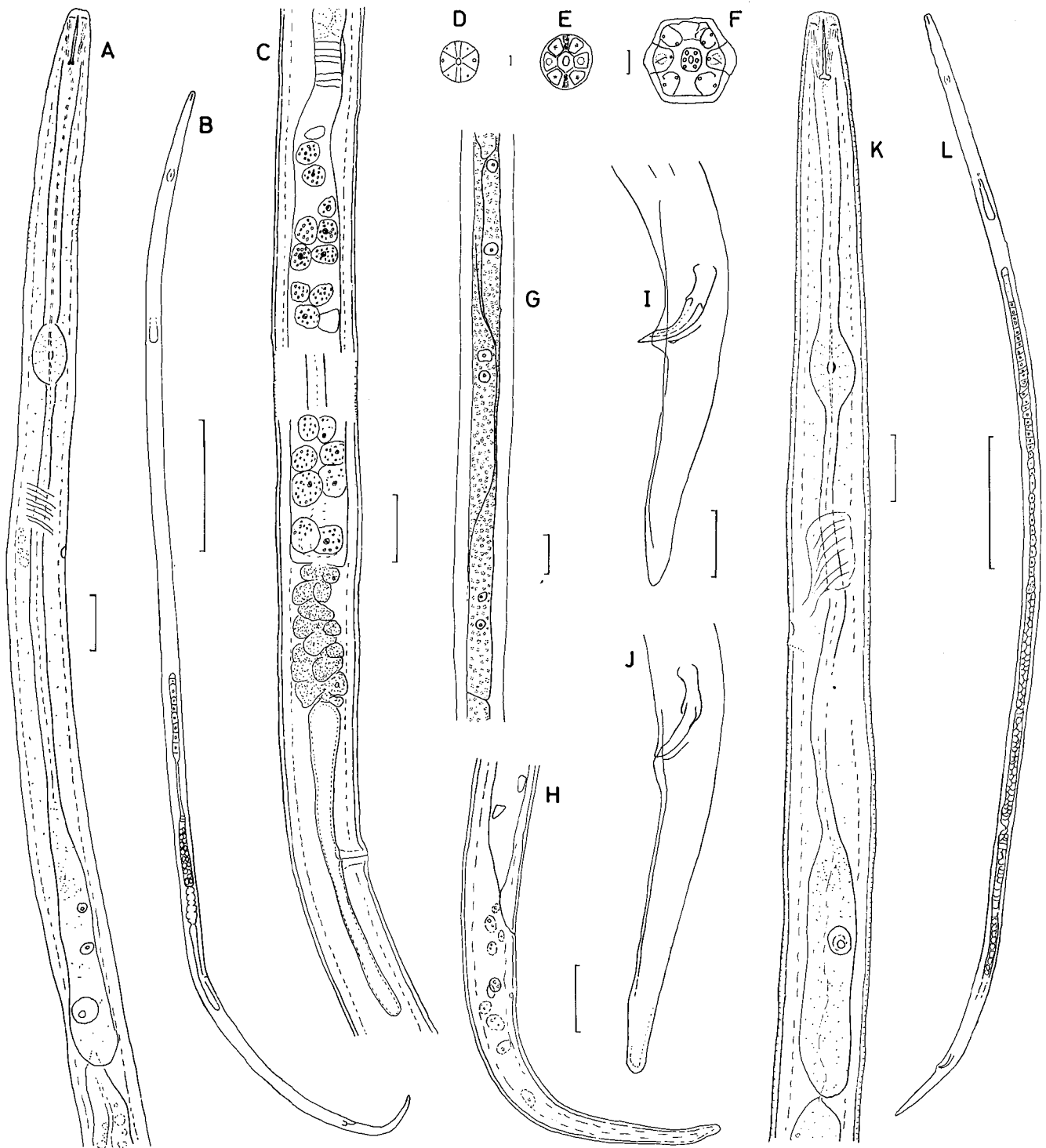
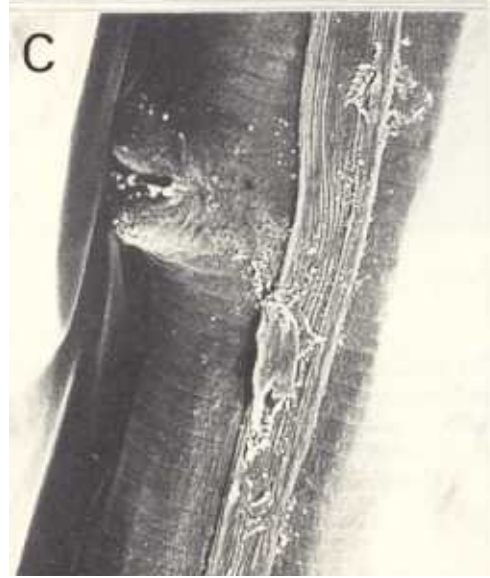
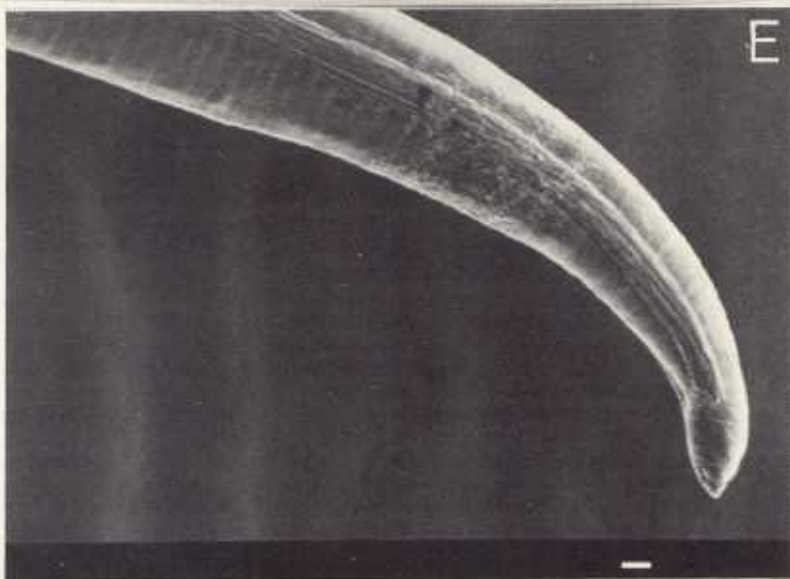
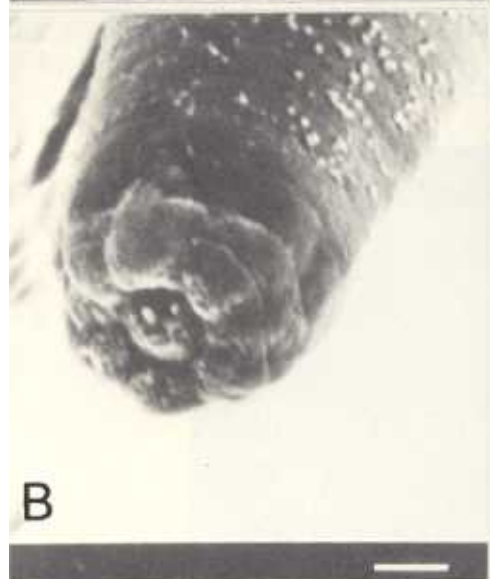
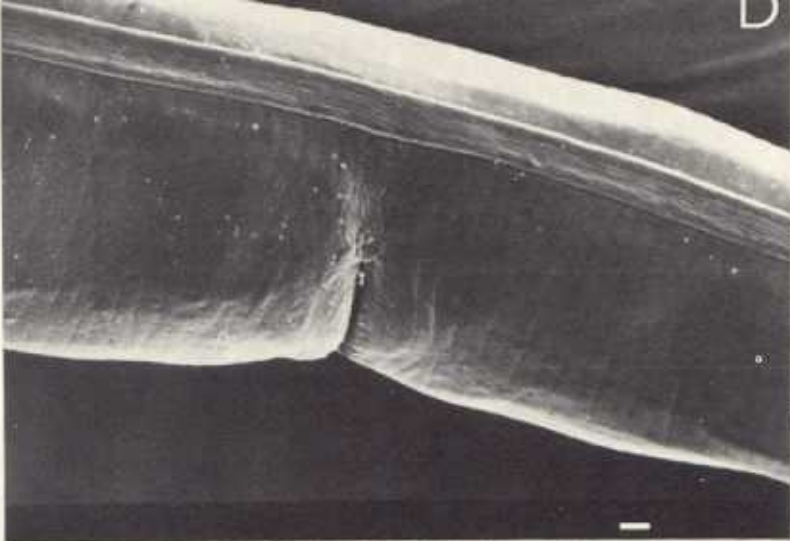
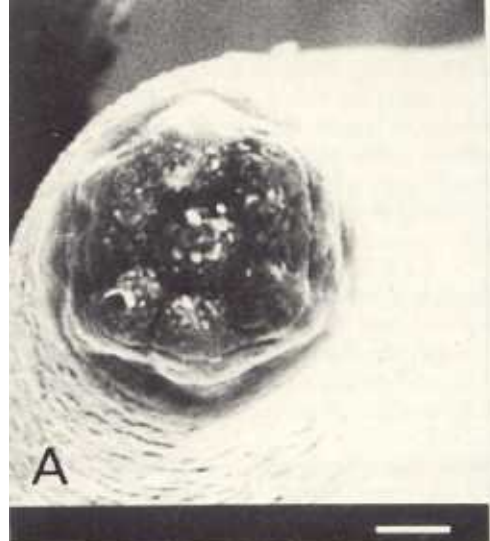


Fig. 1: *Ditylenchus leptosoma* sp. n.: A, female, oesophageal region; B, female, entire view; C, female, reproductive system (also showing lateral field and annulation); D, head, end-on view, light microscope (LM); E, basal head framework, LM; F, head, end-on view, based on SEM micrographs; G, three consecutive intestinal cells at the left side and at about mid-body; H, female tail; I, J: male tails; K, male, oesophageal region, showing also the position of the deirid; L, male, entire view. Scale lines represent 10 μ m, except for B and L (100 μ m) and D-F (1 μ m).

Fig. 2 (Front page): *Ditylenchus leptosoma* sp. n.: A and B, head; C and D, vulva region, in C protruded; E, female tail; F, male tail with outcoming spicules. Scale lines represent 1 μ m, except for F (10 μ m).



openings. LM and SEM clearly show a gap between the submedian lips; LM shows this gap also present at the basal framework and a kind of strengthening ridge on the median line. Stylet delicate, 8.5-10 μm long; knobs about 1.5 μm wide, not always distinct; conus 3-4 μm long (35-45% of total stylet length). Dorsal oesophageal gland opening at about 1.5 μm behind stylet knobs. Oesophagus 162-197 μm long; MB = 32-33%; median bulb well developed with large valves, 5.5-7 μm wide, 10-12.5 μm long; terminal bulb elongated, sometimes slightly overlapping intestine, width 6-7.5 μm , length 30-55 μm . Dorsal gland nucleus usually large (3.5-5.5 μm) located in the posterior half; the subventral nuclei usually smaller (2-4 μm), more anteriorly located and at some distance from each other. In a few specimens intestinal cells and their nuclei were distinct: there are apparently two nuclei in the elongated cells; the cells are per two in circumference. Rectum longer than anal body diameter. Excretory pore indistinct. Hemizonid distinct, 92-99 μm from anterior end, i.e. at about mid-isthmus. Deirid often distinct, just posterior to hemizonid, at 96-110 μm from anterior end. Female reproductive system prodelphic. Vulva from smooth to var-

iously projected. Vulval slit transverse, large. Vagina straight, about 5 μm long. Postvulval uterine sac 20-28 μm long, i.e. 1.5-2.5 times the vulval body diameter. Anterior uterine sac of similar length. Uterus followed by an elongated spermatheca in line containing 4-5 μm large spermatozoa. Ovary with only a few oocytes, suggesting that our population consisted of young females. Female tail conical, ventrally bent; terminus broadly rounded to variously truncated; $c' = 5.5-8.3$.

Male with slightly curved spicules, 16-17 μm long and slender gubernaculum 4.5-6.5 μm long. Bursa beginning well anterior to about mid-spicule, extending the longer part of the tail, and ending near tail end. Cloacal region protruded. Tail straight to curved, conical with a broad end; $c' = 3.2-4.7$.

Type material: holotype on slide 3262, Nematode Collection, Instituut voor Dierkunde, Ledeganckstraat 35, 9000 Gent, Belgium; two female paratypes on same slide; one female, one male on slide 3263, same collection; head section on slides 3264 and 3265, same collection; a slide with two females in the USDA Nematode Collection, Beltsville, Maryland, U.S.A.



Fig. 3: *Carpinus* leaves infected by *Ditylenchus leptosoma* sp. n.: left, heavily infected; middle, mild infestation; right, healthy leaf.

Some slides from an additional collection were sent by the second author to Agricultural University, Wageningen, the Netherlands (five females, five males); to University of California, Davis, U.S.A. (six females, three males); to M. N. H. N., Lab. des Vers, Paris, France (four females,

six males). This was done to supplement some less well preserved material from the original collection.

Type locality: found in leaves of *Carpinus laxiflora* Blume at Bulguk Temple in Kyungju, Korea.

Diagnosis: this species is distinct because of its extreme

thinness, structure of the lateral field, and the position and structure of the six lips.

Differences with related species: no other *Ditylenchus* species is known to be so extremely thin, to have a lateral field with essentially only two lines, or with the six lips divided in two groups of three.

Discussion

The head structure of *D. leptosoma* was compared with that of *Ditylenchus dipsaci* and *Hexatyclus viviparus* (Shepherd *et al.*, 1983; De Grisse, 1977). *Hexatyclus* is entirely different. In *D. dipsaci* the dorsal and ventral radii of the cephalic framework are slightly thicker than the other radii (often found in other tylenchs too) but the lips are equally spaced. As De Grisse (1977) pointed out, the six inner labial sensillae end on a pore near the mouth aperture on the oral disc. Amphid apertures and other head structures of *D. leptosoma* also conform to what is known of *Ditylen-*

chus; so the peculiar lip arrangement as described herein is considered as a species character.

Bionomics: leaves infected by *D. leptosoma* sp. n. become slightly swollen and yellow; in an advanced stage the color changes to dark brown and finally the leaves fall from the tree (Fig. 3).

Literature cited

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