

Institute for Plant Protection and Environment, Belgrade, Yugoslavia  
Istituto di Nematologia Agraria, C.N.R. 70126 Bari, Italy  
Faculty of Agriculture, Belgrade - Zenum, Yugoslavia

## THREE NEW LONGIDORIDS (NEMATODA: DORYLAIMIDA) FROM MONTENEGRO

by

DJ. KRŃJAIĆ, F. LAMBERTI, SMILJKA KRŃJAIĆ, A. AGOSTINELLI and V. RADICCI

**Summary.** Two species of *Longidorus* and one species of *Paralongidorus* were found in the rhizosphere of native vegetation on the beach at Kruče, on the Adriatic coast in Montenegro. *L. igoris* sp. n. is characterized by body length of ca. 5.5 mm; rounded lip region, continuous with the rest of the body, asymmetrically bilobed amphidial pouches; odontostyle length of ca. 95  $\mu$ m; at mid-body vulva; equally developed female genital branches; bluntly rounded tail and absence of males. *L. urosbis* sp. n., a bisexual species, is characterized by body length of ca. 6.5 mm; frontally flat lip region, continuous with the rest of the body; slightly asymmetrically bilobed amphidial pouches; odontostyle length of ca. 135  $\mu$ m; vulva almost at mid-body; equally developed female genital branches; bluntly rounded tail and digitate tail of the first juvenile stage. *P. milanis* sp. n. a bisexual species, is characterized by body length of ca. 4 mm; frontally flat lip region, continuous with the rest of the body; stirrup shaped amphidial pouch, odontostyle length of ca. 110  $\mu$ m; slightly anterior vulva; equally developed female genital branches; bluntly rounded tail; and digitate tail of the first juvenile stage.

The co-authors from Yugoslavia collected various soil samples from the rhizosphere of natural vegetation on the Adriatic coast of Montenegro in the Kruče bay. Three undescribed longidorid species were found. They are described here and named: *Longidorus igoris* sp. n., *L. urosbis* sp. n. and *Paralongidorus milanis* sp. n.

### Materials and methods

Soil samples were collected during different seasons from the rhizosphere of various wild and cultivated plants near the shore. Nematodes were extracted by Cobb's wet sieving technique from 300-500 cc of soil, fixed in 5% hot formalin and processed to glycerine. Specimens were

then mounted in dehydrated glycerine and measured by either an eye-piece scale or a drawing tube.

### Descriptions

#### ***LONGIDORUS IGORIS* sp. n.**

(Table I; Figs 1-3)

Female *habitus* ventrally curved to a closed C or single spiral; body medium sized, cylindrical, tapering gradually towards the anterior extremity. Cuticle finely striated, ca. 2.5  $\mu$ m thick along body, except just behind the lip region, where it is ca. 2  $\mu$ m thick, in the vulval and anal region where it is ca. 3  $\mu$ m thick and at the tail, over 3.5  $\mu$ m thick. Lip region continuous with the body,

TABLE I - *Morphometrics of Longidorus igoris sp. n.*

n	Holotype female	Paratypes				
		18 ♀	10 J <sub>1</sub>	6 J <sub>2</sub>	7 J <sub>3</sub>	8 J <sub>4</sub>
L (mm)	5.2	5.6±0.6 4.2-6.5	1.2±0.05 1.2-1.3	2.1±0.2 1.8-2.3	2.7±0.3 2.3-3.1	4.1±0.4 3.5-4.9
a	108	114.6±8.4 103-131.7	60.8±3.7 55.4-65.5	75.6±5.5 69.5-83	80.9±6.8 71.2-90.4	99.6±8.2 88.4-114.9
b	14.1	13.4±2.7 10.8-20.6	5.2±0.6 4.7-6.6	6.5±0.5 5.6-7.1	8.1±1.6 6.4-10.9	10.6±1.8 8.8-14.2
c	166.7	167.3±20 130.3-202.5	43.4±6.3 36.7-53.3	58.5±3.9 54.4-64.8	74±10 58.6-87.4	117.7±15.4 91-143.5
c'	0.8	0.9±0.1 0.8-1.1	2±0.2 1.7-2.3	1.6±0.2 1.3-1.8	1.4±0.1 1.3-1.6	1.1±0.1 0.9-1.3
V	50	49.8±1.7 46.7-53.5	–	–	–	–
Odontostyle µm	102	96.3±7.2 76.5-105.8	54.7±2.5 50.6-57.5	65.3±1.2 64.4-67.8	72.4±2.4 69.4-74.9	85.7±2.6 82.9-90.2
Odontophore µm	49	53.6±4.9 42.9-61.4	33.4±3.7 28-39	44.7±0.7 44-46	47.6±3.1 43-52.4	49.5±3.7 45.4-54.4
Replacement odontostyle µm	–	–	64.4±4.5 59.5-69	77±2.3 74.7-80.5	81.2±2.9 77.2-86.3	96±3.5 90.8-100
Oral aperture to guide ring µm	31.2	32.5±2.1 29.5-36.8	20±0.9 18.4-21.2	24.6±0.6 23.6-25.2	26±1.5 24.8-28.4	29.2±1.8 27.2-31.8
Tail µm	31.2	33.7±4.1 28.4-45.7	28.8±3.9 23.6-32.9	35.8±3.4 31.9-40.3	35.4±2.4 32.9-38.6	34.9±2.2 31.8-38.6
J (hyaline portion of tail) µm	9	10.4±2.6 6.9-18.2	6.4±1.4 4.7-9.2	5.3±1.0 4.5-6.9	6.9±1.3 5.7-9.1	9±1.4 6.8-11.4
Body diam. at lip region µm	11.5	10.9±0.7 9.3-11.8	6.5±0.6 5.8-7.1	8±0.5 7-8.4	9.1±0.0 9.1-9.1	9.4±1.0 8-10.2
Body diam. at guide ring µm	23	22.6±2.1 17.5-26.1	11.8±0.8 10.4-12.9	16.2±1.2 15-18.2	18.1±1.4 15.9-20.4	19±2.6 13.2-21.6
Body diam. at base of oesophagus µm	46	42.8±3.6 36.3-52.2	18.4±2.1 15-23	26.5±1.0 25.3-27.6	30.3±2.1 27.2-32.9	35.5±6.3 22-43.1
Body diam. at mid-body or vulva	51	49±5.5 40.9-61.3	20.9±1.9 18.4-25.3	28.5±2.1 26.5-31.1	32.6±1.7 29.5-34.1	41.1±4.8 35.2-49.9
Body diam. at anus µm	37	36.4±2.7 30.7-40.9	14±1.6 11.5-16.5	21.9±1.2 19.6-23	25.5±1.9 22.7-28.4	31.4±3.3 27.2-36.6
Body diam. at beginning of J µm	29.5	24.6±4.3 16.1-29.9	11.1±1.4 9.4-13.6	15.5±0.9 13.8-16.1	16.8±2.4 13.6-20.4	22.3±3.2 18.2-27.2

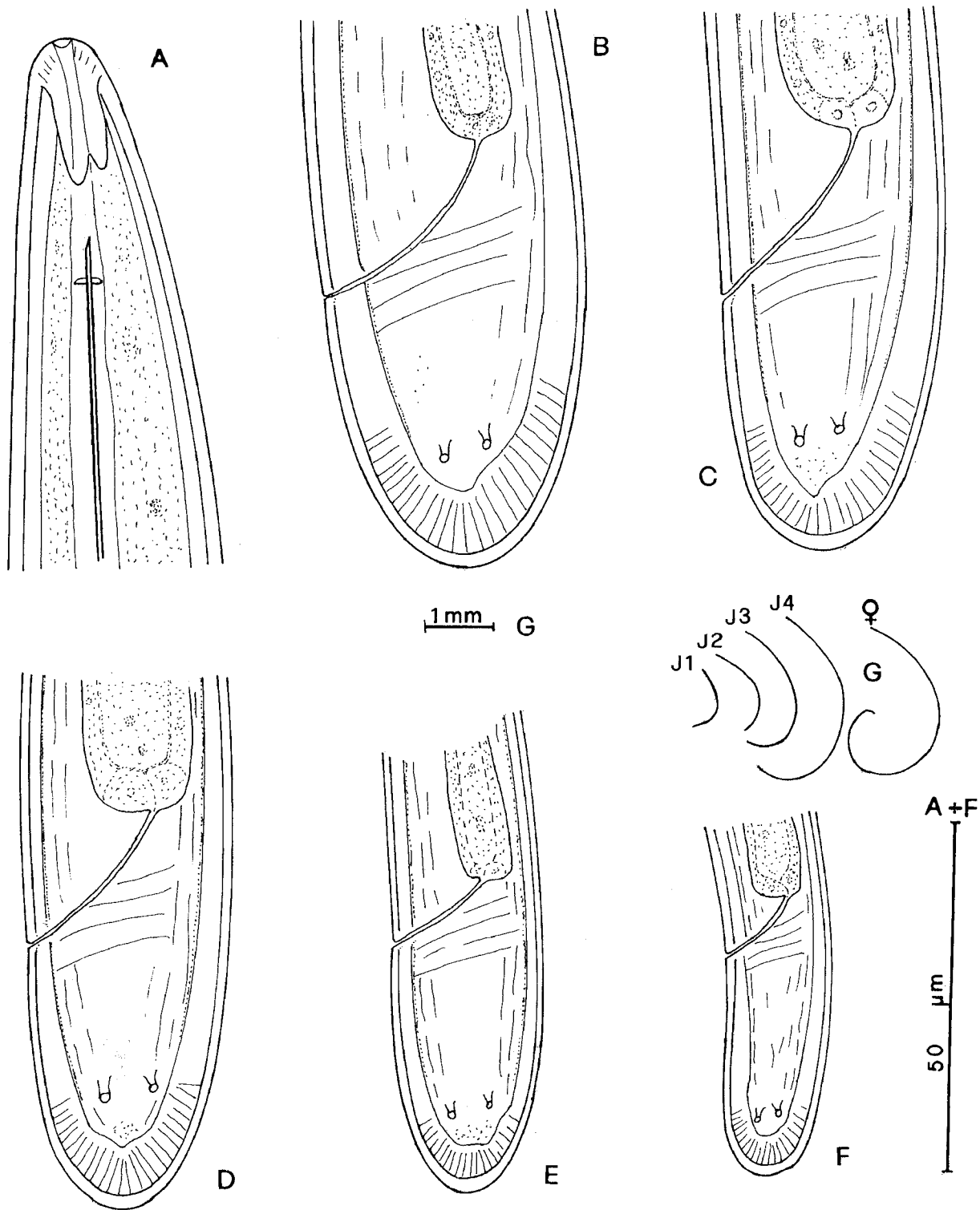


Fig. 1 - *Longidorus igoris* sp. n.: A, female anterior region; B, female posterior region; C-F, tail of fourth, third, second and first juvenile stages, respectively; G, *habitus* of dead specimens.



Fig. 2 - Photomicrographs of *L. igoris* sp. n.: A, female anterior region; B, female posterior region; C-F, tail of first, second, third and fourth juvenile stages, respectively.

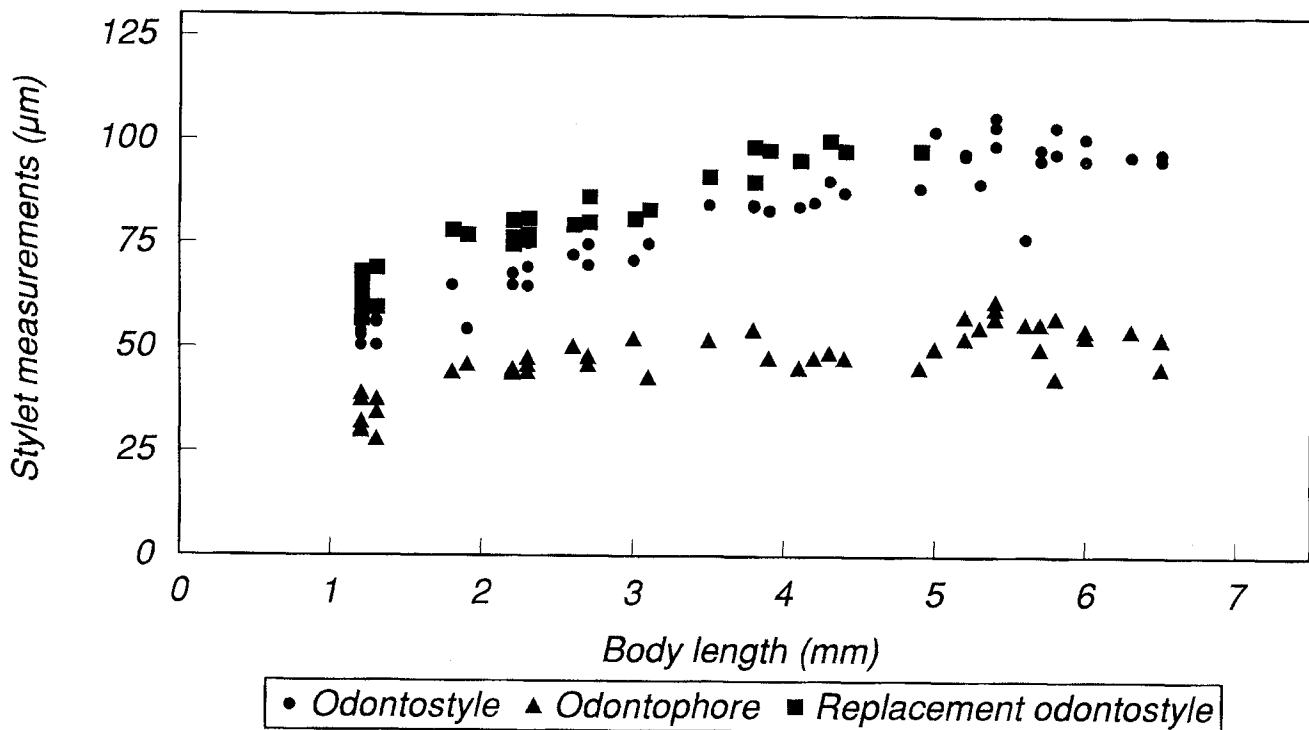


Fig. 3 - Scatter diagram separating juveniles and females of *L. igoris* sp. n.

3.5 to 4.5  $\mu\text{m}$  high, frontally rounded. Amphidial pouches more or less asymmetrically bilobed. Odontostyle, odontophore and guide ring typical of the genus. Oesophagus dorylaimoid with the enlarged basal portion between 1/3 and 1/5 of the entire oesophagus length; the muscular bulb is 100-125  $\mu\text{m}$  long and 18-22  $\mu\text{m}$  wide, with three evident glandular nuclei (DOG=20%, DOO=15-18%, SLGL=51-55%, SLGR=52-57%, SLOL=48-52%, SLOR=50-54%). Oesophageal-intestinal valve conical. Vulva more or less equatorial, slit like; vagina occupying about 1/2 of the corresponding body diameter. Reproductive system amphidelphic with equally developed genital branches; a sphincter separates the uterus from the oviduct; ovaries opposed, reflexed. Two eggs in one live female measuring 205-216x50  $\mu\text{m}$ . Prerectum as long as about eight times the anal body width; rectum as long as 2/3 the anal body width. Tail short hemi-elliptical, bluntly rounded bearing two caudal pores on each side.

Male not found.

Juvenile separated into four stages (Fig. 3). Posture as a J in the first two stages and as an open C in the second two. Tail bluntly rounded in all of the stages.

**Type habitat and locality:** rhizosphere of *Crithmum maritimum* L. in sand on the beach at Kruče bay, on the Adriatic coast of Montenegro. Also found in the rhizosphere of *Smilax aspera* L.

**Type material:** holotype, eight paratype females and 19 paratype juveniles at the Istituto di Nematologia Agraria, Consiglio Nazionale delle Ricerche, Bari, Italy; ten paratype females and paratype juveniles in the Instituto for Plant Protection and Environment, Belgrade, Yugoslavia.

**Diagnosis:** *Longidorus igoris* sp. n. is characterized by body length of ca 5.5 mm; rounded

lip region, continuous with the rest of the body; asymmetrically bilobed amphidial pouches; odontostyle length of ca 95 µm; vulva at mid-body, equally developed female genital branches, bluntly rounded tail and absence of males.

The code in the polytomous key (Chen *et al.*, 1997, Loof and Chen, 1999) is: A 2/3/4, B 1, C 2/3, D 1, E 3, F 2/3, G 2/3, H 1, I 1.

**Relationships:** *Longidorus igoris* sp. n. resembles *L. moesicus*, Lamberti, Choleva *et* Agostinelli, 1983. However, it differs from *L. moesicus* in its shorter body (L 7.2 mm in *L. moesicus*) and odontostyle (ca. 120 µm in *L. moesicus*), anterior vulva (V=53 in *L. moesicus*) and shorter tail (43 µm in *L. moesicus*).

### **LONGIDORUS UROSHIS sp. n.**

(Table II; Figs 4-6)

Female *habitus* ventrally curved to a closed C or single spiral; body medium sized, cylindrical, tapering gradually towards the extremities, abruptly anteriorly in the oesophageal region. Cuticle finely transversally striated, 1.5-3 µm thick along body. Glandular structures are present in the lateral hypodermal cords: very evident in the oesophageal region, more or less distinct after the vulva slit. Lip region continuous with the rest of the body, 5-6 µm high, frontally flattened and laterally rounded. Amphidial pouches slightly asymmetrically bilobed. Odontostyle, odontophore and guide ring typical of the genus. Oesophagus dorylaimoid with the basal bulb occupying 1/4-1/5 of the oesophagus total length; the basal bulb measures 120-130 µm long and 20-25 µm wide; it contains three glandular nuclei (DOG=19-25%; DOO=12-16%; SLGL=50.6-55%; SLGR=50.6-52%; SLO=ca. 50%). Oesophageal-intestinal valve shield shaped. Vulva a transverse slit almost at mid-body; vagina with thick walls, strongly muscularized, occupying ca. 1/2 of the corresponding body diameter. Reproductive system amphidelphic with almost equally developed genital

branches [842 (668-909) µm the anterior and 788 (657-886) µm the posterior]; a large sphincter separates the spermatheca from the uterus; the large spermatheca contains sperms (2.5-3.5x1.5-2.5 µm); ovaries opposed, reflexed. Prerectum as long as 12-16 times the anal body width; rectum as long as the anal body width. Tail bluntly rounded dorsally convex and ventrally straight, bearing two caudal pores on each side.

Male frequent, with the posterior region of the body more coiled than in the female. Testes well developed and apparently functional, ca. 600 µm long, filled with sperms. Spicules robust, ventrally arcuate; guiding pieces lens shaped, 13 µm long and 2.5 µm wide. The adanal pair of supplements is preceded by a row of 10-14 ventromedian supplements. Tail dorsally convex, conoid with rounded terminus, bearing two caudal papillae on each side.

Juveniles separated into four juvenile development stages (Fig. 6). Their posture is more or less ventrally arcuate to form a J shape in the first and second stages to an open C in the third and the fourth stages. The first juvenile stage with digitate tail.

**Type habitat and locality:** rhizophere of *Juniperus oxycedrus* L. between very old olive trees at Kručë, on the road to Ulcinj, Montenegro. At the same site it was found also in the rhizophere of *Smilax aspera* L., *Hedera helix* L. and *Myrthus communis* L.

**Type material:** holotype, six paratype females, four paratypes males and 13 paratype juveniles at the Istituto di Nematologia Agraria, Consiglio Nazionale delle Ricerche, Bari, Italy; five female, three male and 22 juvenile paratypes in the Institute for Plant Protection and Environment, Belgrade, Yugoslavia.

**Diagnosis:** *Longidorus urosbis* sp. n. is a bisexual species characterized by body length of ca. 6.5 mm; frontally flat lip region continuous

TABLE II - *Morphometrics of Longidorus uroshis sp. n.*

n	Holotype female	Paratypes					
		11 ♀	7 ♂	3 J <sub>1</sub>	8 J <sub>2</sub>	9 J <sub>3</sub>	9 J <sub>4</sub>
L (mm)	6.6	6.5±0.6 5.6-7.6	6.6±0.9 5.8-8.2	1.5±0.1 1.4-1.6	2.1±0.3 1.6-2.5	3±0.3 2.6-3.5	4.7±0.5 3.9-5.5
a	104.5	101.1±4.1 96.9-108.9	105.1±7.6 94-117.2	60.9±5.3 55-65.2	68.5±6.7 61.6-82	76.8±5.3 71.8-87.3	88.2±10.2 69.2-100
b	11.8	11.8±1.1 10.3-14.2	12.8±1.9 11-15.7	5.1±1.3 3.9-6.4	5.9±0.6 4.9-6.7	7.6±1.0 6.2-8.7	9.6±0.9 8-10.6
c	148	140±13.4 120.4-162	140.8±16.6 121.6-166.7	34.9±2.7 32-37.5	55±7.7 41.4-66.3	72.4±8.0 62.3-87.7	106.9±11.6 84-120.5
c'	0.9	1±0.1 0.9-1	1±0.1 1-1.1	2.8±0.2 2.6-3	1.7±0.2 1.3-1.9	1.3±0.2 1-1.5	1±0.1 0.8-1.2
V	50.7	51.8±1.3 49.2-53.2	–	–	–	–	–
Odontostyle µm	134.3	135.5±4.9 125-143.6	138.6±6.0 127.9-144.4	78.8±7.7 70.5-85.7	89.4±4.4 85.3-98.9	100.9±4.2 94.2-106.6	121.5±5.7 110-127.8
Odontophore µm	78.3	70.1±6.4 59.7-80.2	74.1±4.7 68.1-82	45.9±10.0 39.2-57.4	53.4±2.7 50.4-57.4	58.7±6.9 46.6-67.2	71.1±6.6 56.3-79.3
Replacement odontostyle µm	–	–	–	88±3.0 85.8-91.4	101.2±4.2 95.5-106.6	117.4±5.7 108.2-123.1	142.9±5.5 130.6-145.5
Oral aperture to guide ring µm	41	42.5±2.4 38.2-46.6	39.8±1.7 36.9-42	21.5±1.8 19.7-23.3	27.5±1.5 26-29.8	30.2±1.4 27.9-32	37.7±1.8 35.4-41
Tail µm	44.8	46.2±2.3 42.9-53.2	46.7±2.1 42.9-49.2	43.2±1.9 41-44.7	39.3±2.7 35.4-44.3	41.9±2.3 39.2-46	44.4±2.1 41-46.6
J (hyaline portion of tail) µm	15.9	17.7±1.2 15.9-20.5	15.8±1.5 13.1-16.8	17.3±1.2 16.4-18.7	9.9±1.7 7.5-11.5	10.5±1.8 8.2-13.1	12.5±1.9 11.2-16.8
Body diam. at lip region µm	16.8	17±1.9 14.9-20.5	17.4±0.7 16.4-18.2	8±0.5 7.5-8.4	10.2±0.8 9.3-11.5	12.2±1.2 10.3-13.1	14±1.4 13.1-16.8
Body diam. at guide ring µm	31.7	32.5±1.2 30.8-34.4	31.3±1.4 29.5-32.6	14.6±0.5 14-14.9	18.7±1.6 16.4-21.5	24±3.4 19.6-31.7	27.1±4.1 19.6-31.7
Body diam. at base of oesophagus µm	55	55.7±2.7 51.3-59.7	56±4.0 50-60.2	22.3±0.8 21.5-23	29.6±3.9 24.6-35.4	37.4±2.0 34.4-39.4	47.6±4.2 42.9-54.1
Body diam. at mid-body or vulva µm	63.4	63.8±5.2 57.8-76.5	63.4±5.1 56.9-70	22±5.9 15.2-26.1	31.9±4.3 26.3-37.6	39.6±2.6 36-42.6	54.2±7.4 44.8-69
Body diam. at anus µm	49.4	48.6±3.5 43.8-55.2	45±1.6 43.8-47.7	15.5±1.1 14.8-16.8	24.4±3.9 20.5-30.8	31.4±2.3 28-35.4	45.1±5.6 39.2-54.1
Body diam. at beginning of J µm	36	36.2±2.5 30.8-40.1	28.8±2.0 25.2-29.8	9.8±1.3 8.8-11.2	17.2±2.5 14-20.5	22.3±2.9 18.9-25.2	30.1±3.3 26.1-35.4
Spicules µm	–	–	65.5±4.5 59.4-72				

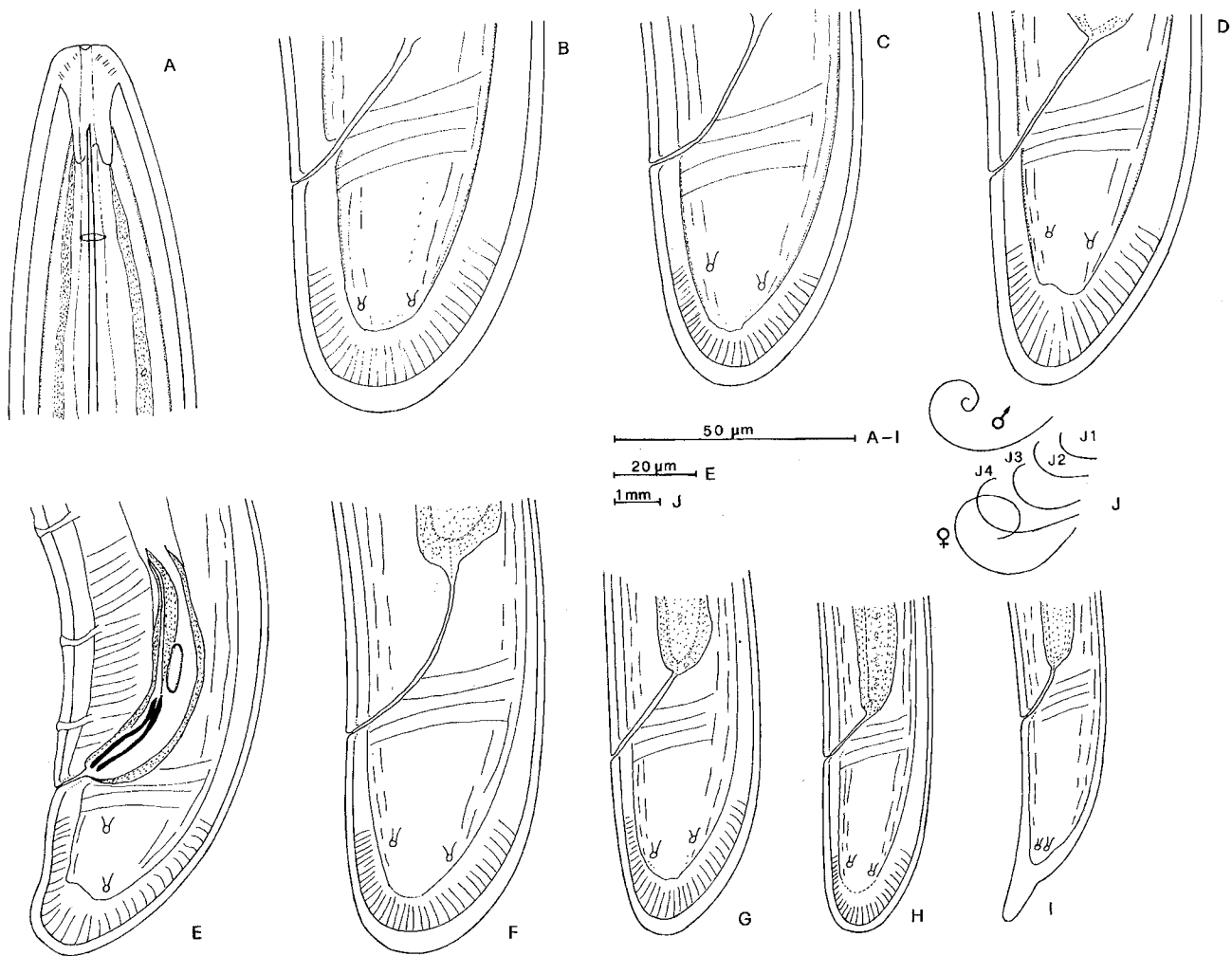


Fig. 4 - *Longidorus uroshis* sp. n.: A, female anterior region; B-D, female posterior region; E, male posterior region; F-I, tail of fourth, third, second and first juvenile stages, respectively; J, *habitus* of dead specimens.

with the rest of the body; slightly asymmetrically bilobed amphidial pouches; odontostyle length of ca. 135  $\mu$ m; almost at mid-body vulva, equally developed female genital branches; bluntly rounded tail and male with 10 to 14 ventromedian supplements in addition to the adanal pair; digitate tail in the first stage juvenile.

The code in the polytomous key (Chen *et al.*, 1997; Loof and Chen, 1999) is: A 5/6, B 2/3/4, C 3/4, D 3, E 2/3, F 3/4, G 2, H 1, I 2.

**Relationships:** *Longidorus uroshis* sp. n. is similar to *L. saginus* (Khan, Seshadri, Weischer *et Mathen*, 1971) and *L. apulus* Lambert *et Blevé-Zacheo*, 1977.

Compared with *L. saginus*, *L. uroshis* differs in its longer body (mm 4.8-6.4 in *L. saginus*), posterior vulva (V=40-45 in *L. saginus*) and differently shaped lip region (cylindrical in *L. saginus*) and tail (conical more pointed in *L. saginus*).



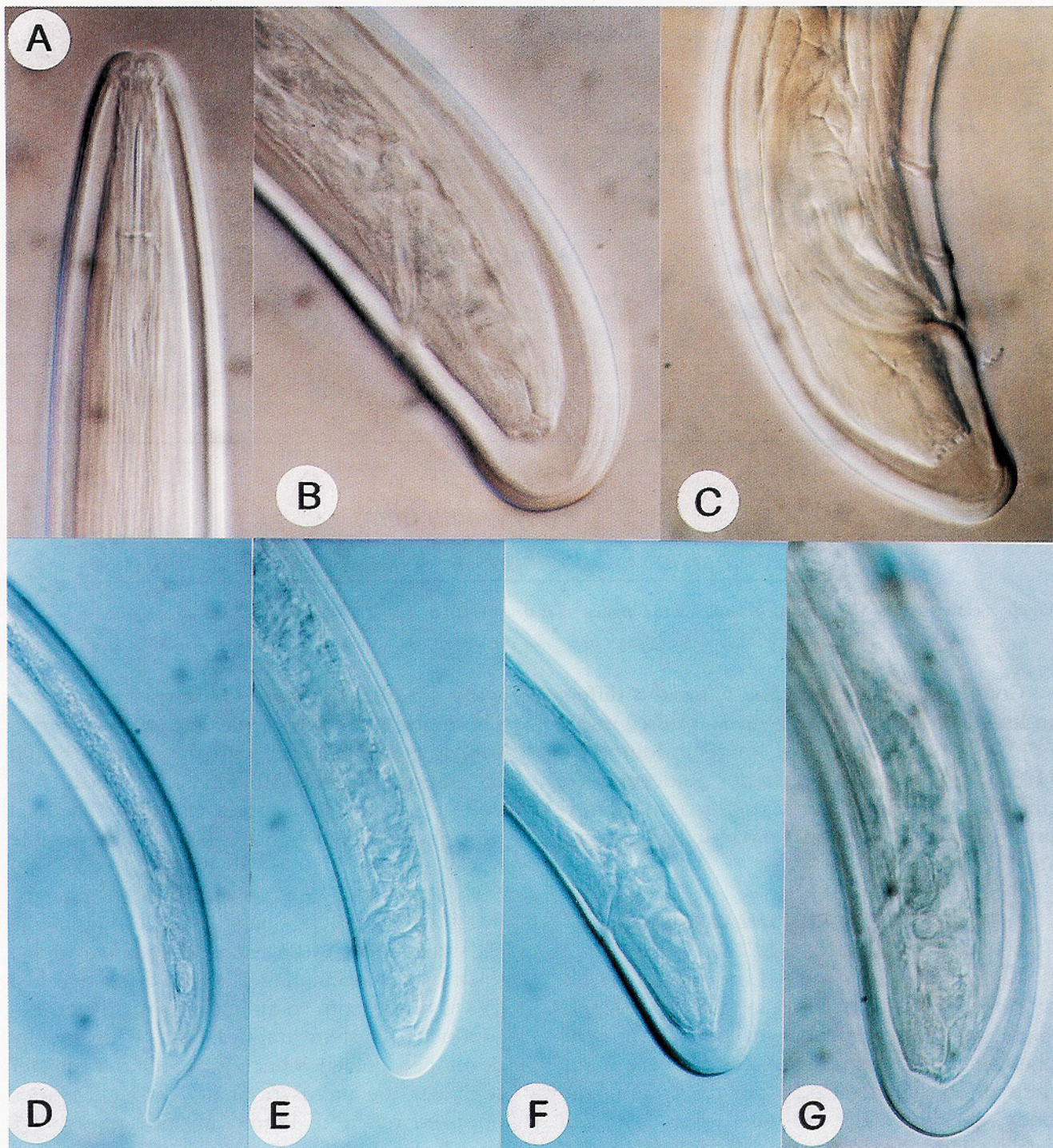


Fig. 5 - Photomicrographs of *L. urosbis* sp. n.: A, female anterior region; B, female posterior region; C, male posterior region; D-G, tail of first, second, third and fourth juvenile stages, respectively.

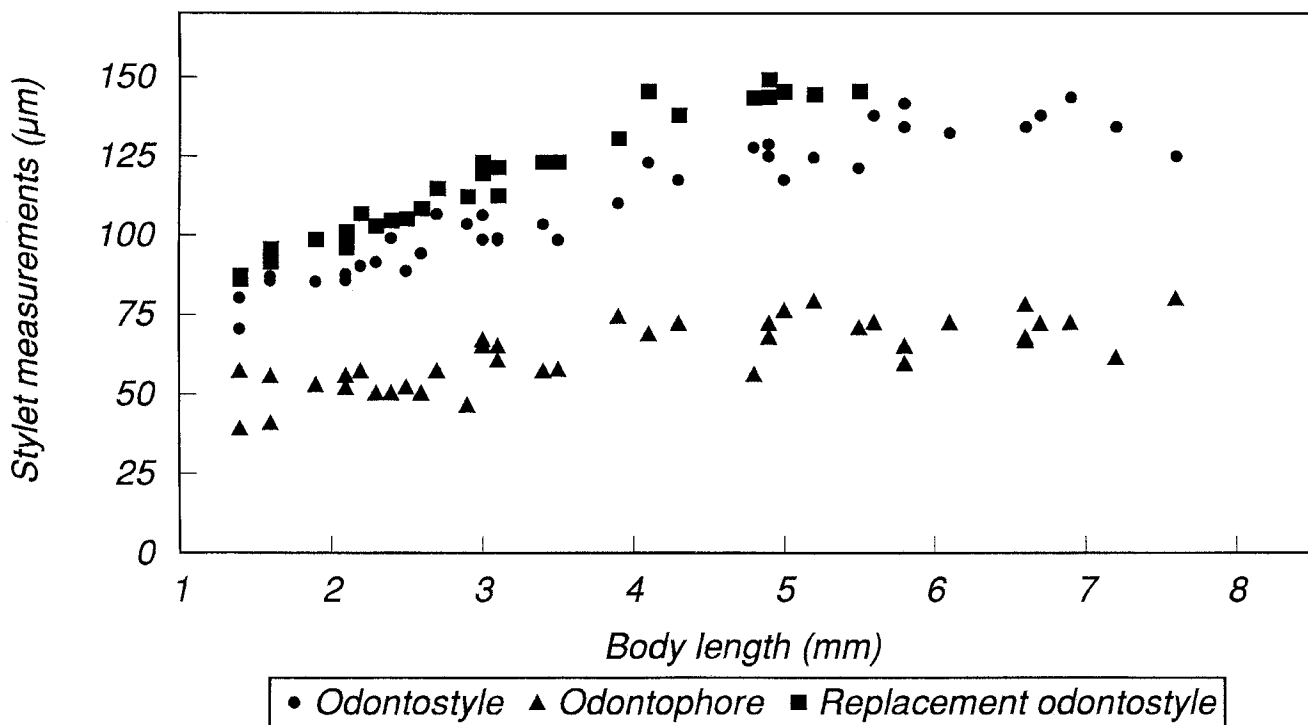


Fig. 6 - Scatter diagram separating juveniles and females of *L. urosbis* sp. n.

Compared with *L. apulus*, *L. urosbis* differs in its lower value of a (139 in *L. apulus*) and c (170 in *L. apulus*) ratios; longer odontostyle (103 µm in *L. apulus*), posterior guide ring (31 µm from anterior end in *L. apulus*) and differently shaped lip region (expanded in *L. apulus*).

#### ***PARALONGIDORUS MILANIS* sp. n.**

(Table III; Figs 7-9)

Female *habitus* from an open C to a single spiral; body small, slender, cylindrical, tapering gradually to the extremities. Cuticle very finely transversally striated, 2-2.5 µm thick along the body, except on the tail where it is 3.5-4 µm thick. Glandular structures are present in the lateral hypodermal cords along body length. Lip region frontally flattened and laterally rounded, continuous with the rest of the body, 4-6 µm high. Amphidial pouches stirrup shaped with

wide slit-like aperture. Odontostyle, odontophore and guide ring typical of the genus. Oesophagus dorylaimoid with the posterior bulb measuring 101 (98-110) µm long and 20 (18-20.1) µm wide; it occupies ca 1/3 of the total oesophagus length and contains three visible nuclei (DOG=28-30%; DOO=22-26%; SLGL=48-55%; SLGR=46-55%; SLO=44-52%). Oesophagus-intestinal valve heart shaped. Vulva a transverse slit situated slightly anterior to mid-body; vagina thick walled occupying 1/3 (in young females) to 1/2 of the corresponding body diameter. Reproductive system amphidelphic with equally developed genital branches; a robust sphincter separates the uterus from the oviduct; ovaries opposed reflexed. Prerectum as long as 7-15 anal body width and rectum as long as anal body width. Tail conoid, dorsally convex and ventrally from straight to very slightly concave, bluntly rounded at terminus, bearing two caudal pores on each side.

TABLE III - *Morphometrics of Paralongidorus milanis sp. n.*

n	Holotype female	Paratypes					
		26 ♀	6 ♂	8 J <sub>1</sub>	7 J <sub>2</sub>	9 J <sub>3</sub>	12 J <sub>4</sub>
L (mm)	3.6	3.9±0.4 3-4.9	3.7±0.3 3.4-4.2	1.2±0.04 1.1-1.2	1.8±0.1 1.7-2	2.1±0.2 1.8-2.4	2.7±0.4 2.2-3.4
a	76.3	80.7±7.5 64.6-100.5	74.9±6 69-84.7	54.1±1.5 51.5-56.2	60.8±5.1 55.4-68.5	62.7±5.2 56.2-70.6	70.3±5.5 61.8-82.4
b	9.6	9.7±1.3 7.9-13.4	9.1±1.0 8.1-10.5	4.1±0.2 3.6-4.3	5.7±0.8 4.8-7	6.7±1.2 5.6-8.9	6.9±1.3 5.2-8.9
c	105.6	107±10.2 86.3-129.8	88.1±6.9 82.2-100	29.8±1.3 28-32.3	45.7±3.5 42.2-50.7	52.1±5.5 44.6-59.2	69.7±7.2 57.8-83
c'	1.0	1.05±0.1 0.9-1.3	1.1±0.1 1-1.3	2.7±0.2 2.2-2.8	1.8±0.1 1.6-1.9	1.5±0.2 1.3-1.8	1.3±0.2 1.4-1.7
V	48	48±1.5 45-50	-	-	-	-	-
Odontostyle µm	106.6	107.8±3.1 98.4-118.5	110±3.7 105-114.8	71.8±2.1 67.2-73.8	80.1±3.1 73.8-82	86.6±3.0 82-90.2	92.1±1.8 88.6-95.1
Odontophore µm	65.6	64.8±3.0 57.4-68.9	67.8±4.7 64-74.6	46.3±2.1 42.6-49.2	46.6±2.5 42.6-50.8	52±2.7 47.6-55.8	56.6±3.7 49.2-60.8
Replacement odontostyle µm	-	-	-	81.2±2.8 75.4-83.6	89±2.1 86.6-91.8	97.5±3.1 91.8-101.7	106.3±3.7 100-111.5
Oral aperture to guide ring µm	32.8	33.6±1.6 30.3-36.1	32.9±3.7 28.7-37.3	19.7±1.2 18-21.3	20.3±1.3 21.3-26.2	27.1±2.2 24.6-31.2	30.4±0.8 29.5-31.2
Tail µm	34.4	36.5±2.5 31.2-41	42.7±4.8 39.2-50.8	39.9±1.8 36.1-41.8	38.9±1.3 37.7-41	40±2.7 36.1-43.5	39.2±2.4 36.1-44.2
J (hyaline portion of tail) µm	11.5	10.9±1.1 8.6-13.1	12.3±1.8 9.3-13.9	9.8±0.9 8.2-11.5	8.5±1.1 6.7-9.8	8.9±0.8 8.2-9.8	8.3±0.5 8.2-9.8
Body diam. at lip region µm	13	12.8±0.5 11.5-13.1	12.7±0.8 11.2-13.1	7.5±0.7 6.6-8.2	9±0.8 8.2-9.8	9.9±0.6 9.2-11.5	11.2±0.6 9.8-12.3
Body diam. at guide ring µm	19.4	24±2.0 19.7-27.9	24.5±3.4 20.5-28	14.1±0.8 13.1-14.6	17.3±1.9 14.8-19.7	18.5±2.1 16.4-22.1	20.6±1.8 18-23.1
Body diam. at base of oesophagus µm	42.6	43-2.9 36.2-47.6	43.8±3.1 41-47.6	20.9±0.6 19.7-21.3	28.4±0.8 27.9-29.5	30.9±2.3 27.9-34.4	36±3.8 29.5-42.6
Body diam. at mid-body or vulva µm	47.6	48.7±3.8 42.6-55.8	49.9±4.5 45.3-55	21.9±0.8 21.3-23	29.5±1.0 27.9-31.2	33.2±1.8 29.5-36.1	39.6±4.7 31.2-49.2
Body diam. at anus µm	34.4	34.9±3.1 27.9-41	38.9±1.5 37.3-41	15.1±0.6 14.8-16.4	21.8±0.8 21.3-23	26.6±1.8 24.6-29.5	30.8±3.8 24.6-39.4
Body diam. at beginning of J µm	23	22.8±2.8 18-29.5	20.4±1.7 18-22.4	6.6±0.9 4.9-8.2	10±0.6 9.8-11.5	12.6±2.4 9.8-14.8	16.5±2.1 11.5-19.7
Spicules µm	-	-	47.6±6.1 41-54.1	-	-	-	-

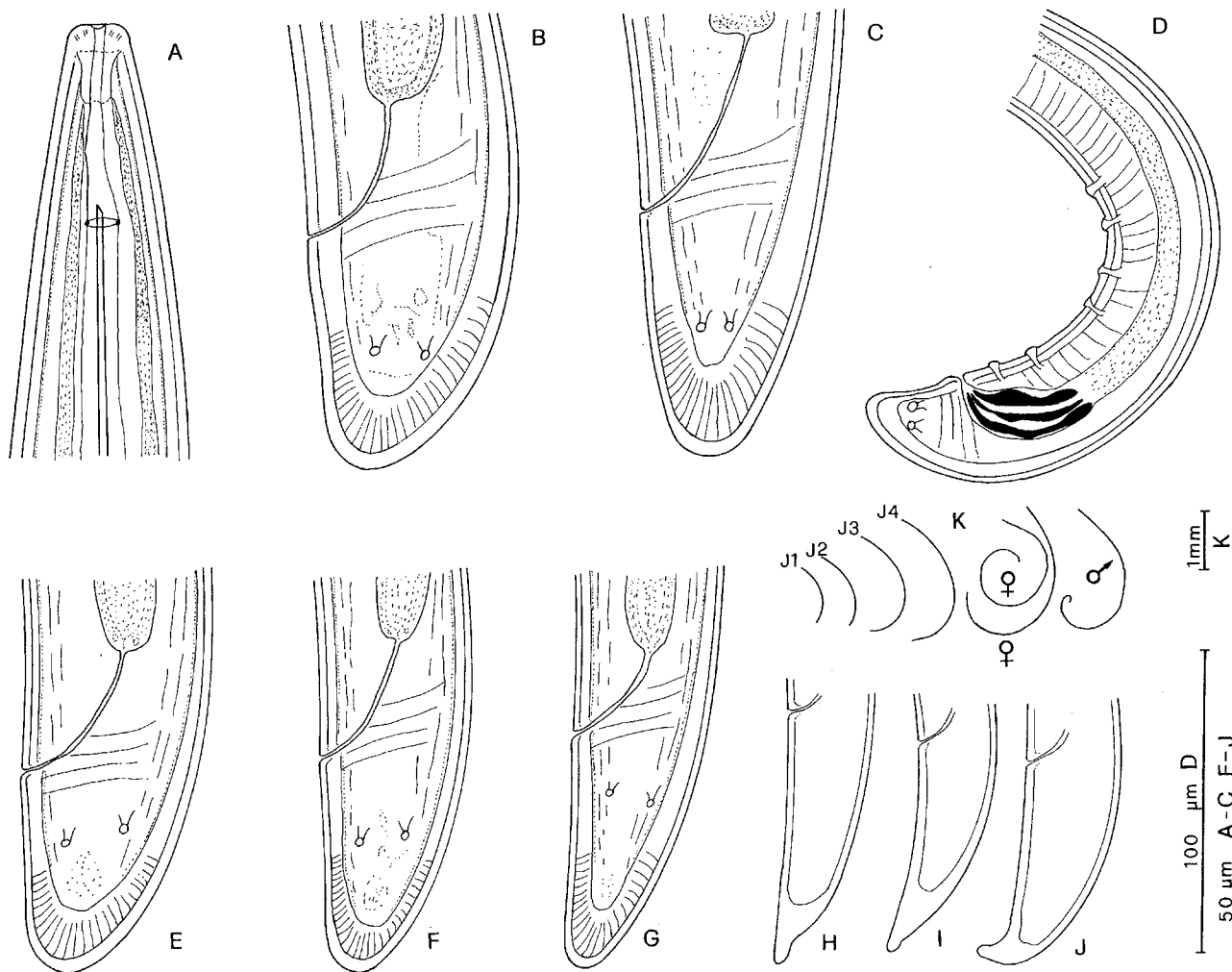


Fig. 7 - *Paralongidorus milanis* sp. n.: A, female anterior region; B-C, female posterior region; D, male posterior region; E-G, tail of fourth, third and second juvenile stages, respectively; H-J, tail of first juvenile stage; K, *habitus* of dead specimens.

Male uncommon, with posterior region more coiled than in female. Testes well developed 250-300  $\mu\text{m}$  long, functional, with many sperms inside, measuring  $4.5 \times 2.5 \mu\text{m}$ . Spicules robust, dorsally convex with ca. 20  $\mu\text{m}$  long guiding pieces. The adanal pair of supplements is preceded by a row of 4-9 ventromedian supplements. Tail short, conical with rounded terminus, dorsally convex and ventrally slightly concave, bearing two caudal pores on each side.

Juveniles separated into four juvenile stages (Fig. 9). Their posture varies from J to an open C. First juvenile stage with digitate tail of various shape.

**Type habitat and locality:** rhizophere of oak, *Quercus pubescens* Wild at Kruče on the beach on the Adriatic sea, Montenegro.

**Type material:** holotype, 13 paratype females, four paratype males and ten paratype juveniles at the Istituto di Nematologia Agraria,

Consiglio Nazionale delle Ricerche, Bari, Italy; 13 females, two males and 31 juvenile paratypes in the Institute of Plant Protection and Environment, Belgrade, Yugoslavia.

**Diagnosis:** *Paralongidorus milanis* sp. n. is a bisexual species characterized by body length of ca. 4 mm; frontally flat lip region, continuous with the rest of the body; stirrup shaped am-

phidial pouches, odontostyle length of ca. 110  $\mu\text{m}$ ; slightly anterior vulva; equally developed female genital branches; bluntly rounded tail and male with 4 to 9 ventromedian supplements, in addition to the adanal pair; digitate tail in the first juvenile development stage.

The code in the polytomous key (Escuer and Arias, 1997) is: A 1, B 1, C 1, D 2, E 2, F 1/2, G 3/4, H 1, I 2/3, K 2, L 1/2, M 1, N 1, O 1.

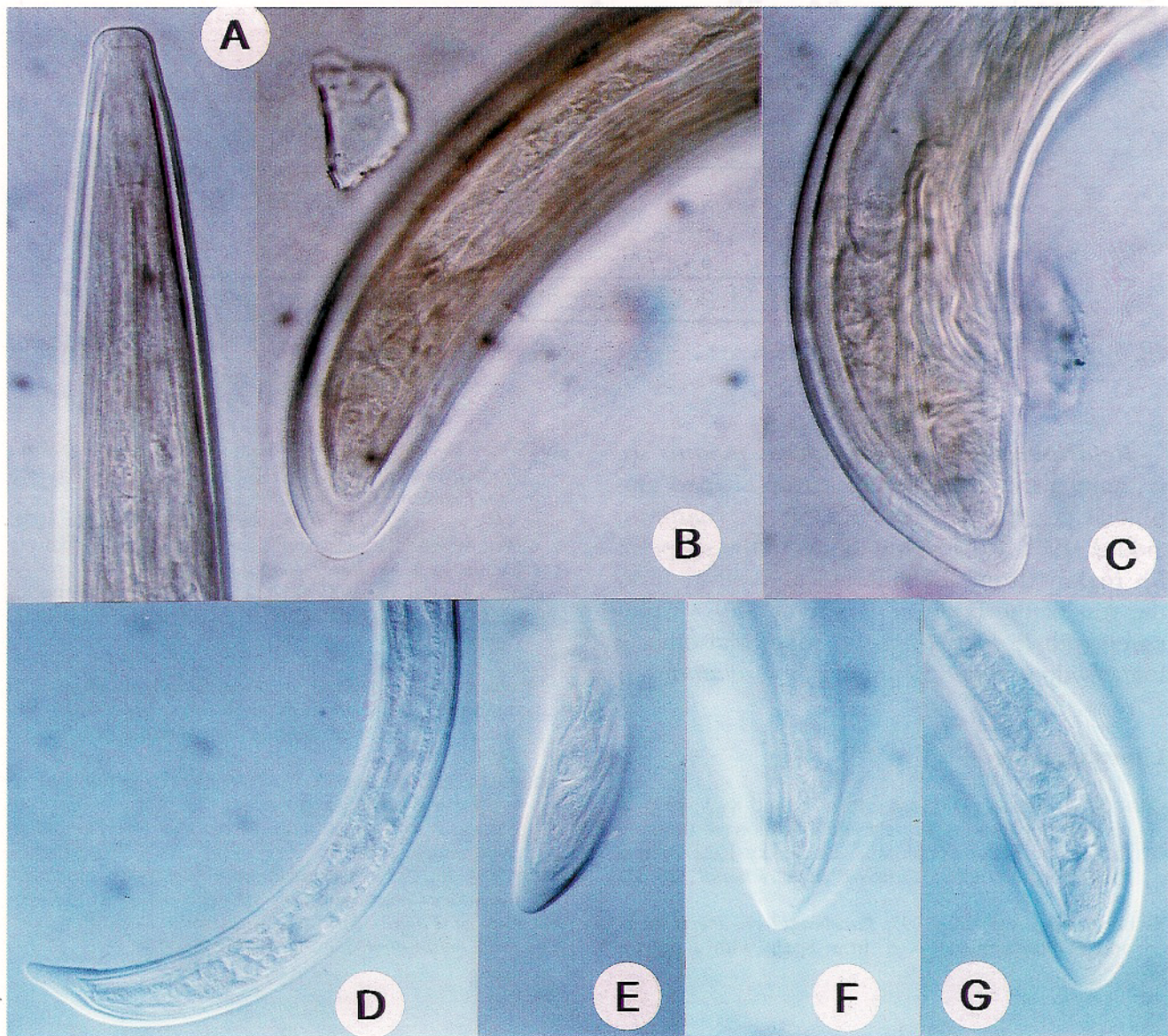


Fig. 8 - Photomicrographs of *P. milanis* sp. n.: A, female anterior region; B, female posterior region; C, male posterior region; D-G, tail of first, second, third and fourth juvenile stages, respectively.

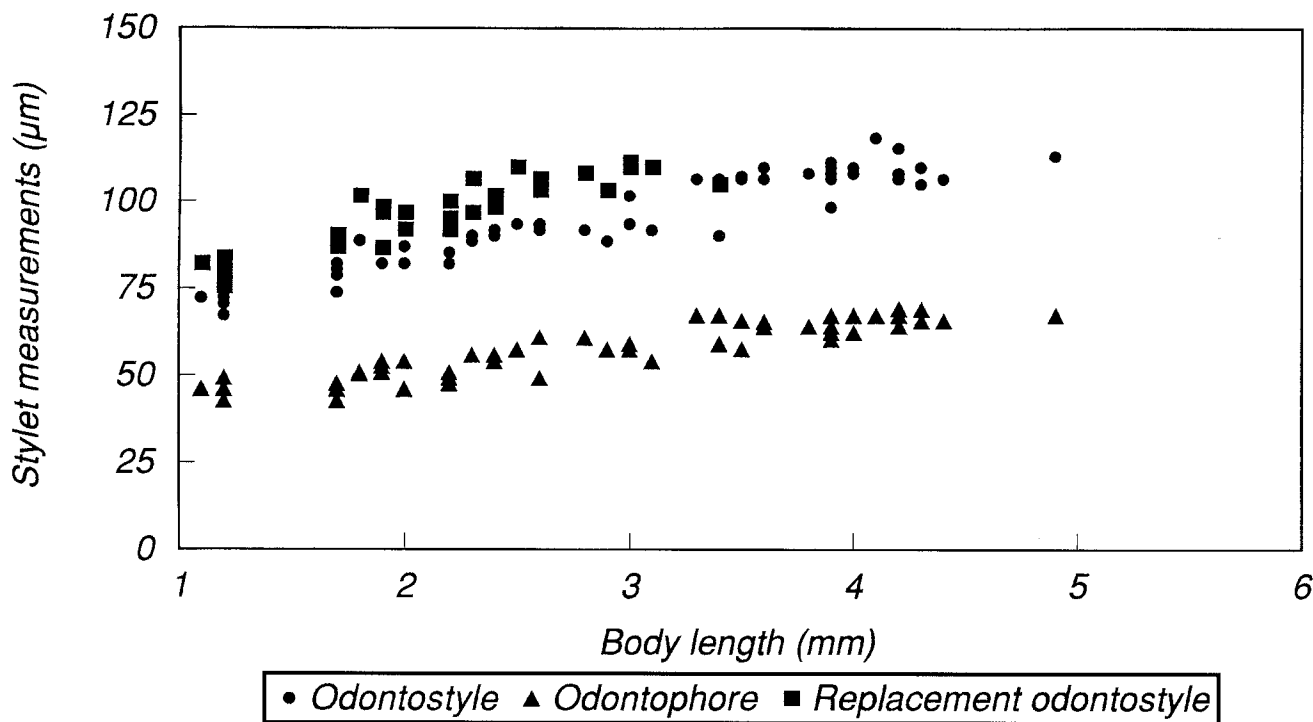


Fig. 9 - Scatter diagram separating juveniles and females of *P. milanis* sp. n.

**Relationships:** *Paralongidorus milanis* sp. n., among the species with stirrup shaped amphidial pouches, is similar to *P. microlaimus*, Siddiqi, 1964. However, it differs in the shape of lip region (frontally rounded and offset from the rest of the body in *P. microlaimus*). Compared with *P. microlaimus*, *P. milanis* also has a longer odontostyle (65 µm in *P. microlaimus*).

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