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TWO NEW SPECIES OF DORYLAIMIDA (NEMATODA) FROM THE MEDITERRANEAN REGION

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Two new nematode species of the order Dorylaimida are described from near the Mediterranean Sea. *Laevides ingens* sp. n. from Israel is characterized by the very large (5.4–6.4 mm) and slender body, continuous head, small and thin mural tooth, long prerectum, simple vagina, long eggs, slender spicula, separate ventromedial supplements and broadly rounded, slightly clavate tail. *Metaxonchium nobile* sp. n. from Serbia is characterized by the long body (3.0–3.6 mm), smooth cuticle, roomy lacuna at cervical region, very long cylindrus, strongly sclerotized vulval lips, relatively long prevulval genital branch, unusually long and proximally strongly tapered spicula, spaced supplements, and by the spheroid tail. As regards the shape of the spicula, this latter species differs from all other species of the genus.

Key words: Israel, *Laevides, Metaxonchium,* new nematode species, Serbia

INTRODUCTION

The order Dorylaimida is one of the most species-rich groups of free-living Nematoda. According to a recent census (ANDRÁSSY 2009), it includes 253 valid genera and 2637 valid species. These numbers are, of course, very far from final, since many new taxa continue to be detected and described every year. This paper presents two dorylaimoid species new to science, one belonging to the suborder Nygolaimina, the other to the suborder Dorylaimina. They came from soil sampled in two countries in the wider Mediterranean region, Israel and Serbia.

MATERIAL AND METHODS

The nematode samples were fixed at the collecting site with 4% formaldehyde solution. In the laboratory they were washed out by flotation techniques and sieves. The nematodes were picked out by hand, and fixed again with FAA. Subsequently, they were processed to pure glycerine by a slow method, and finally mounted on permanent glass slides.

At present, the type specimens are preserved in the collection of the author, later they will be deposited at the Zoological Collection of the Hungarian Natural History Museum, Budapest.

DESCRIPTIONS

Laevides ingens sp. n.
(Figs 1 A–D, 2 A–B and 3 A–F)

Holotype female. L = 5.46 mm; a = 52; b = 6.5; c = 98; c' = 1.0; V = 47%.

Paratype females (n = 6). L = 5.44–6.45 mm; a = 57–64; b = 6.3–6.9; c = 92–104; c' = 0.9–1.3; V = 46–51%.

Paratype male. L = 5.16 mm; a = 64; b = 5.7; c = 74; c' = 1.3.

Type specimens. Holotype female on slide No. 12449. Paratypes: six females and one male. Type specimens will be deposited at the Hungarian Natural History Museum.

Type habitat and locality. Mud from a small lake in Buteicha Valley, part of the Jordan Great Rift Valley at north-eastern corner of Lake Kinneret (= Sea of Galilee or Gennesaret), between Galilee and Golan Heights, Israel; collected in February, 1984 by F. D. Por (Jerusalem).

General description. Body very large and slender, straight when relaxed, equal in thickness with exception of extremities; width 92–110 µm (female) or 80 µm (male) wide at mid-length. Cuticle smooth, relatively thin, thickness 3.0–3.5 µm on most body and 5–7 µm on tail. Lip region 22–24 µm wide, not differentiated, practically confluent with neck (or very slightly offset); lips amalgamated with minute papillae. Body at posterior end of oesophagus 4.2–4.5 times as wide as head. Amphid apertures occupying about half of corresponding body width. Mouth tube 52–57 µm long (measured from oral field), spacious.

Mural tooth small and thin, 14–16 µm long on the dorsal sector, dorylaimoid with a short oblique dorsal aperture. Entire length of tooth about equal to two-thirds the width of lip region. Oesophagus 830–920 µm long, comparatively short, occupying less than one-sixth of total body length, gradually widened at middle. Oesophageal gland nuclei rather inconspicuous; D = 62–66%, AS1 = 23–26%, AS2 = 26–28%, PS1 = 68–70%, PS2 = 69–72%. Glandularium 250–280 µm long. Cardia with three large spherical glands.

Female. Genital apparatus amphidelphic, well developed, each branch 6.0–6.7 times the body width long or occupying 12–13% of body length (if no uterine eggs present), and 9.6–10.0 times the body width long or occupying 15–16% of body length (if uterine eggs present). Vulva transverse, its lips not sclerotized, vagina narrow, yellowish in colour, 40–42 µm long, extending over 40% of body width. Eggs 2–4 in number, very large, oblong, measuring 220–330 µm by 70–75 µm, 2.4–3.4 times as long as mid-body width. Distance between posterior end of oesophagus and vulva 2.0–2.2 times as long as oesophagus. Vulva–anus distance equal to 40–54 tail lengths. Prerectum long and slim, 4.6–6.0 times longer than anal body diameter. Tail 52–75 µm long, or 1.0–1.3% of entire length of body, as long as or somewhat longer than anal body diameter, slightly clavate, with broadly rounded terminus.

Male. Similar to female in most characters. Testes two, spermatozoa fusiform. Spicula 100 µm long along the curved axis. Gubernaculum 17 µm long. Ventromedial supplements 6, well spaced. Prerectum 7.6 anal body widths long, beginning anterior to supplements. Tail 70 µm long, broadly rounded. Caudal papillae three pairs.

Main characters and relationships. A very large and slender species with head practically not offset, small and slender buccal tooth, long prerectum, simple

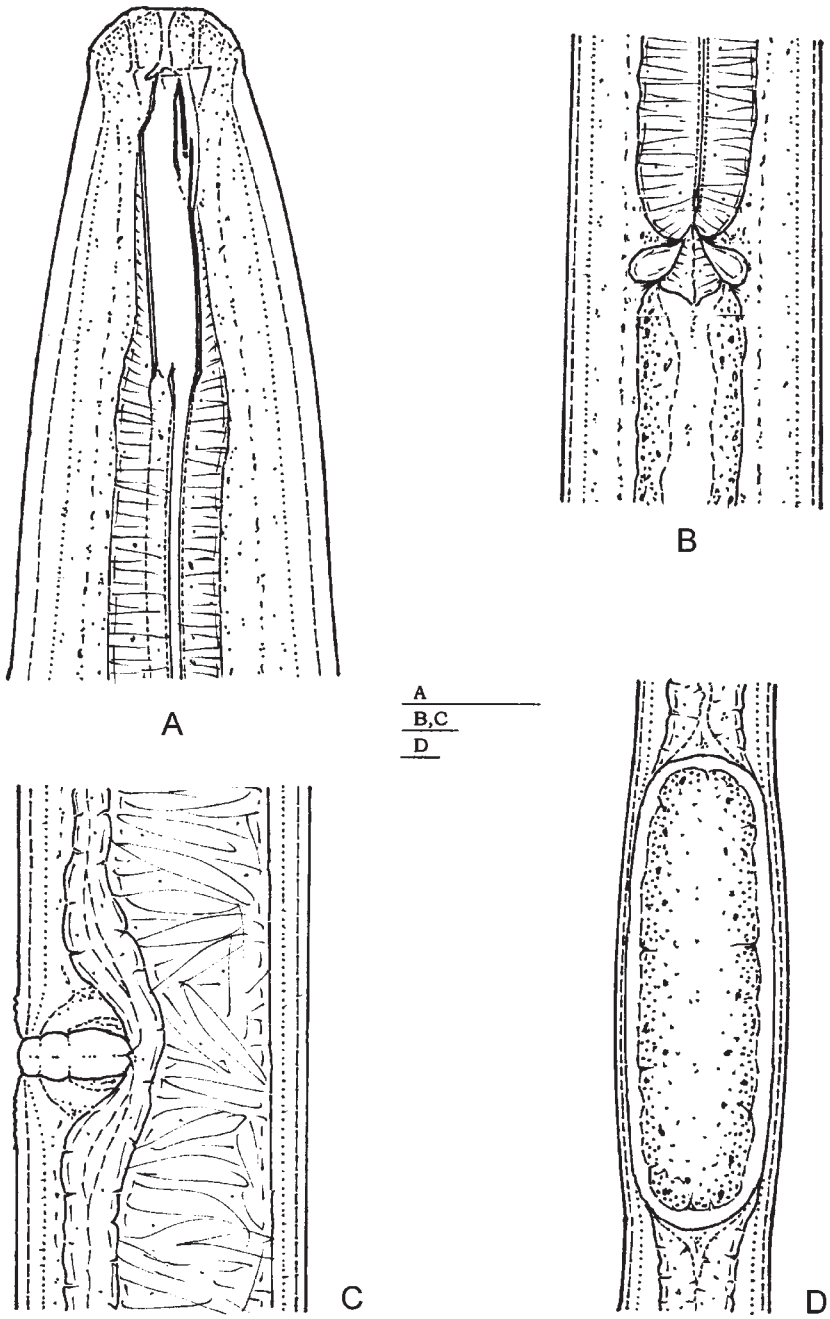


Fig. 1. *Laevides ingens* sp. n.: A = anterior end, B = cardial region, C = vulval region (intestine with compact contents), D = uterine egg. (Scale bars 20 μm each)

vagina, long gonads, long eggs, slender spicula, widely spaced ventromedial supplements and broadly rounded, somewhat clavate tail.

The genus *Laevides* HEYNS, 1968 belongs to the family Nygolaimidae, and, including the new one, contains fourteen species. They live in both terrestrial and limnetic habitats, and are distributed in Europe, Asia, Africa, North and South America. This genus contains the longest specimens among the nygolaimoid nema-

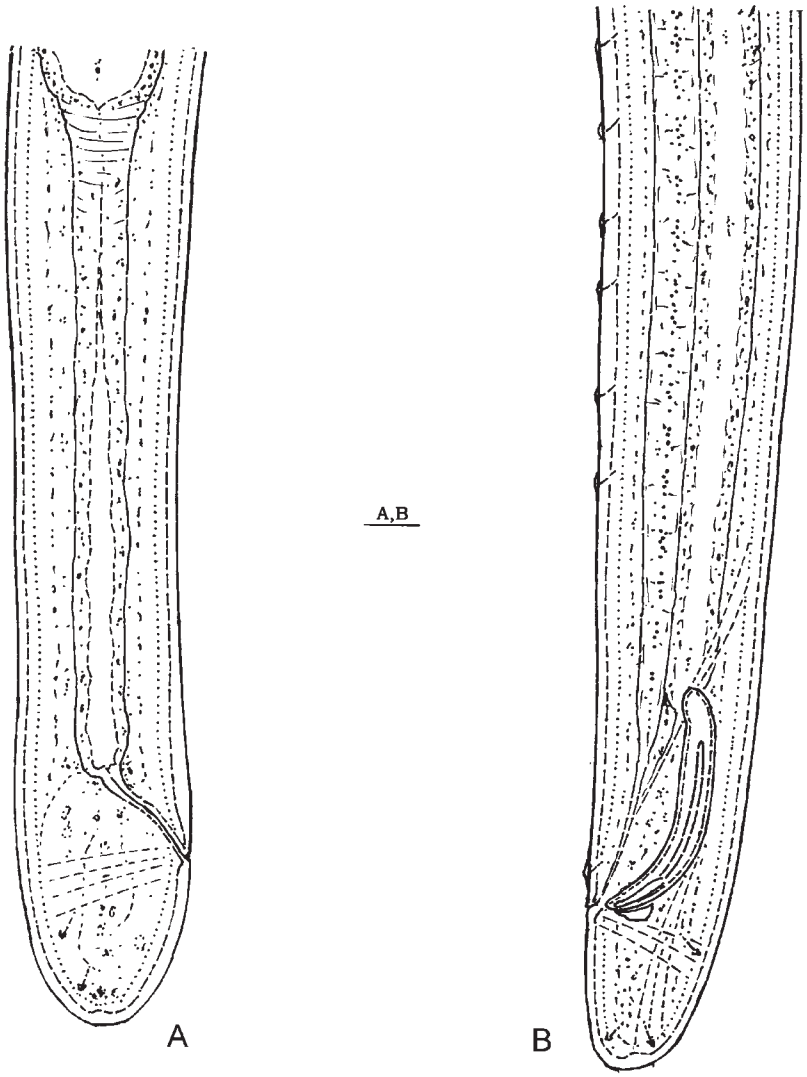
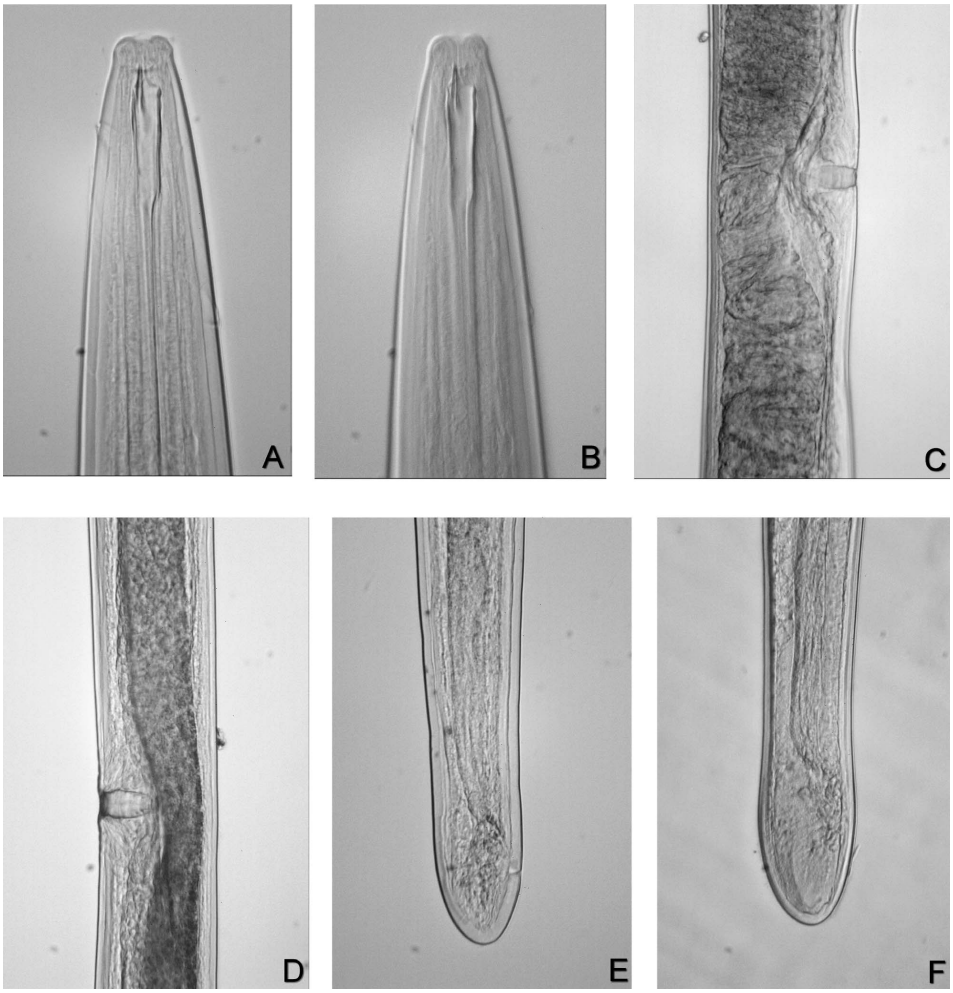


Fig. 2. *Laevides ingens* sp. n.: A = female posterior region, B = male posterior region. (Scale bar 20 µm)

todes. While the body of the major part is ranging between 1.3 and 3.3 mm, three species may reach 4 or even 7 millimetres. These latter are *Laevides rapax* (THORNE, 1939) HEYNS, 1968, *L. husmanni* (MEYL, 1954) HEYNS, 1968 and *L. loofi* HEYNS, 1968. It should be noted that *L. husmanni* and *L. loofi* are very likely identical with each other.

In its body size, *Laevides ingens* sp. n. can be compared with the above mentioned large species. It differs from *L. rapax* by the longer body (females 5.4–6.4 *vs*. 3.7–4.5 mm), wider head (22–24 *vs*. 18–19 μm), thin tooth, shorter oesophagus



Fig, 3. *Laevides ingens* sp. n. microphotos: A–B = anterior end, C–D = vulval region, E–F = female posterior end

(b = 6.3–6.9 *vs*. 4.5–5.5), and by the simple and narrow vagina. It can be differentiated from *L. husmanni* and *L. loofi* by the not so extremely long body (females 5.4–6.4 *vs*. 6.0–7.3 mm), shorter buccal tube (52–57 *vs*. 65–66 µm), thinner tooth, more posteriorly located vulva (46–51 *vs*. 39–42%), and by the shape of the vagina.

Etymology. The species epithet *ingens* (Latin) means: huge, very big.

Metaxonchium nobile sp. n.
(Figs 4 A–F, 5 A–B and 6 A–F)

Holotype female: L = 3.27 mm; a = 37; b = 3.6; c = 80; c' = 0.9; V = 47%.

Paratype males (n = 2): L = 2.96–3.59 mm; a = 40–46; b = 3.3–3.6; c = 70–97; c' = 0.8–0.9.

Type specimens. Holotype female on slide No. 15002. Paratypes: two males. Type specimens will be deposited at the Hungarian Natural History Museum.

Type habitat and locality. Wet soil from a grassland, Zlatibor Plateau, north of Nova Varoš, Serbia; collected in October 2004 by J. KONTSCHÁN (Budapest).

General description. Large and slender nematodes with more or less ventrally arcuate body; body 74–88 µm wide at mid-region. Cuticle very finely striated transversely (practically smooth), 3.5–4.5 µm thick on mid-body, and 8.5–10.0 µm thick on tail, with two main layers: outer layer subdivided into two secondary layers (under light microscope); outer and inner layers nearly equally thick on the anterior half of the body, inner layer strongly thickened posteriorly, especially on tail. On both sides of the anterior neck region, between the cuticle and somatic musculature, a roomy lacuna can be observed. Lip region small, 12–13 µm wide, offset by a deep constriction; lips also small, separate, anteriorly pointed with minute papillae. Body just posterior to lips narrower than the subsequent region, neck-like, at posterior end of oesophagus 6–7 times as wide as head. Amphids cup-shaped with apertures occupying nearly three quarters of corresponding body width.

Odontostyle fusiform, 12–13 µm long, as long as the lip region width, about as thick as cuticle at the same level. Aperture occupying one quarter of stylet length. Odontophore rod-like. Guiding ring simple, thin. Oesophagus 886–990 µm long consisting of a slender anterior tubular part and a much longer, highly muscular posterior portion, separated from the anterior part by a constriction. Expanded part of oesophagus (cylindrus) 636–720 µm long, occupying 61–63% of the entire length of oesophagus; surrounded by fairly thick muscle sheath of straight bundles. Dorsal oesophageal nucleus prominent, large, located at 30–31% of oesophagus length or 8.3–9.3% of total body length. Ventrosublateral nuclei, as usual in Axonchiinae, inconspicuous. Glandularium 610–690 µm long. Cardia tongue-like, broad, 34–48 µm long, surrounded by thin intestinal tissue.

Female. Reproductive system pseudo-opisthodelphic, consisting of a long prevulval uterine sack plus a rudimentary oviduct (or ovary?), and a long postvulval uterus, an oviduct and a long reflexed ovary. Anterior genital branch 3.5 times the body diameter long or occupying 9% of body length, posterior branch 7.0 times the body width long or occupying 18% of body length. Vulva transverse, oval with large, heart-shaped and heavily sclerotized inner lips. Vagina 56 µm long, extending two-thirds across the body. Uterine eggs not observed. No echinulate bodies (Z-differentiation) in uterus. Prerectum 8 times, rectum 1.3 times as long as anal body diameter. Distance between posterior end of oesophagus and vulva shorter (0.7 times) than oesophagus. Vulva–anus distance equal to

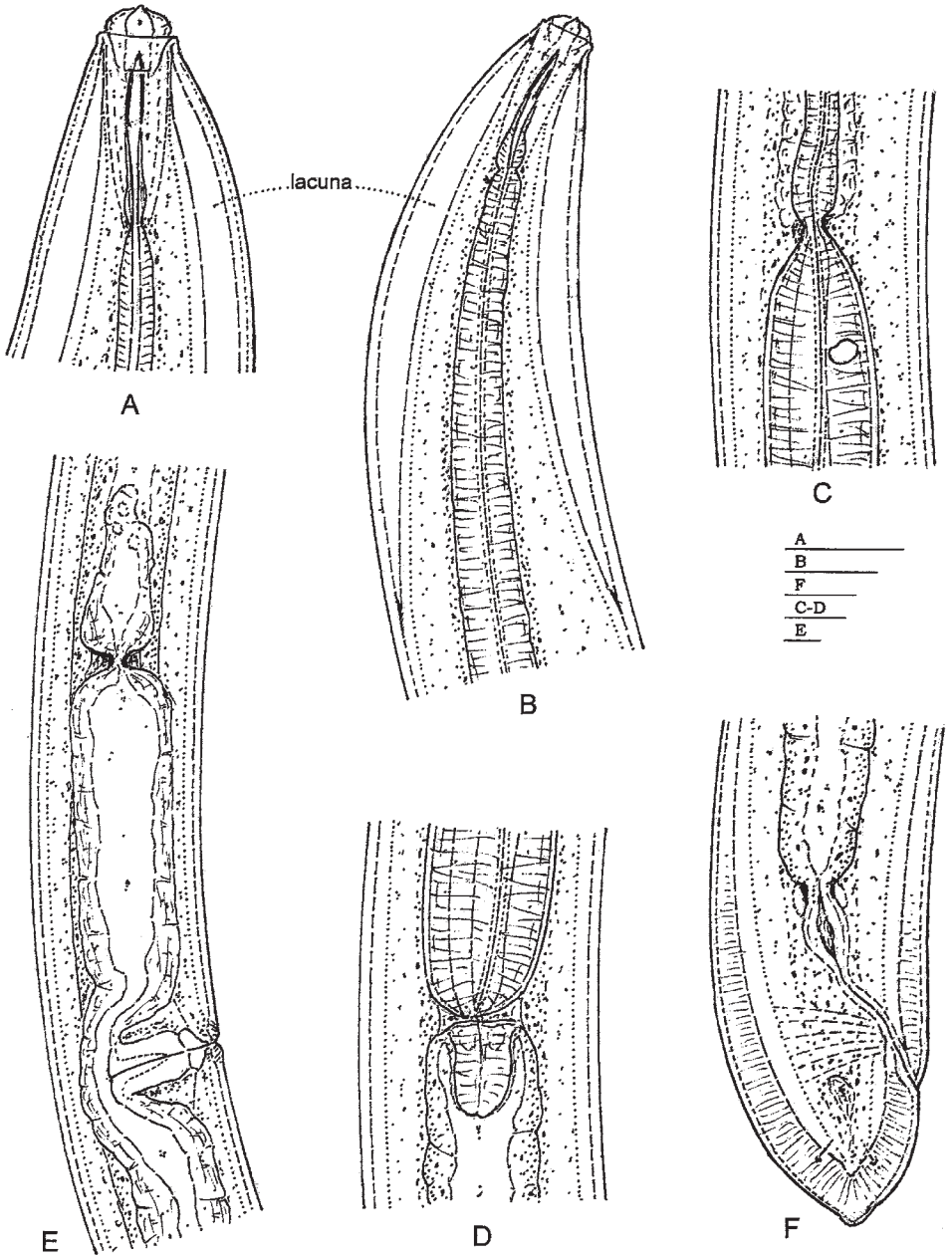


Fig. 4. *Metaxonchium nobile* sp. n.: A = anterior end, B = cervical region, with large lacunae, C = junction between the two sections of the oesophagus, D = cardial region, E = vulval region, with the anterior genital branch, F = female tail. (Scale bars 20 μm each)

41 tail lengths. Tail hemispheroid with small submammillate terminus and strongly thickened cuticle, 38 µm long, occupying 1.2% of entire body length. Two pairs of caudal pores.

Male. Similar to the female in most respects. Testes two. Spermatozoa ovoid, 8–10 µm long. Spicula slightly arcuate, 98–106 µm long, 2.4–2.6 times as long as tail, slender with an unusually long and strongly tapered anterior part (neck). Supplements consisting of double adcloacal papillae, preceded by 9 or 10, small, well-spaced ventromedial supplements, posterior two of them located within the spicular range. Series of supplements 196–208 µm long. Prerectum 9–12 times anal body width long, beginning 1.4–1.6 body widths before the anteriormost supplement. Tail similar to that of female, rounded, 38–42 µm long, occupying 1.0–1.4% of total body length. Three pairs of caudal pores present.

Main characters and relationships. Metaxonchium nobile sp. n. is characterized by a long body, practically smooth cuticle, neck-like narrowing behind lips, roomy lacuna at cervical region, very long cylindrus, long prerectum, sclerotized vulval lips, long vagina, relatively long prevulval genital branch, uterus without echinulate bodies, unusually long and proximally strongly attenuated spicula, spaced supplements, and by the short spheroid tail.

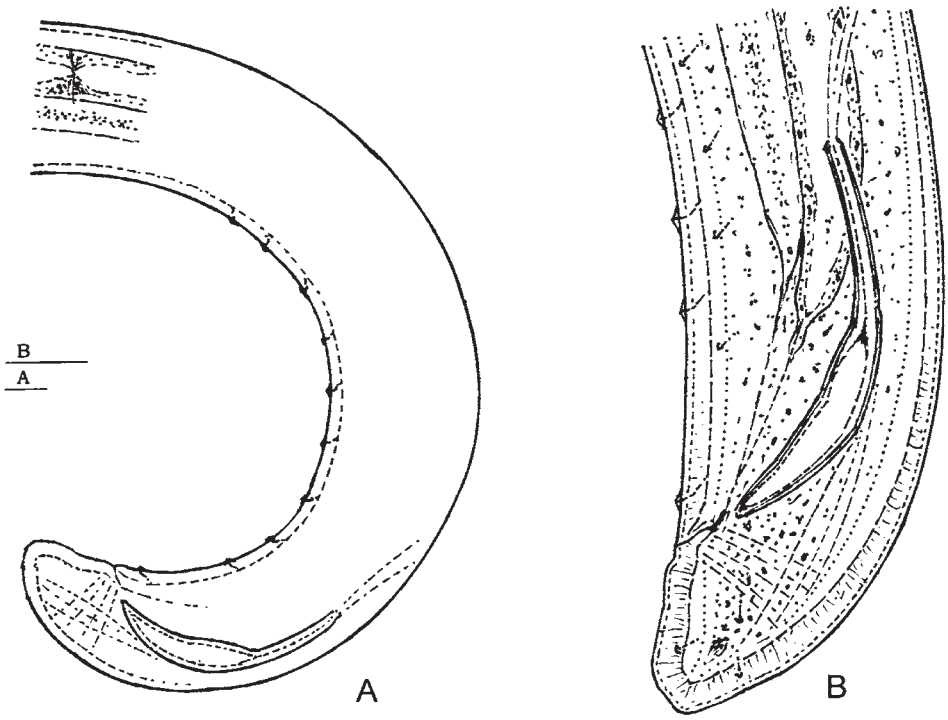


Fig. 5. *Metaxonchium nobile* sp. n.: A = posterior region of male, B = male posterior end. (Scale bars 20 µm each)

In the shape and size of the body, length of the odontostyle, strongly sclerotized vulval lips, presence of an anterior rudimentary genital portion, shape and length of the tail, number of the ventromedial supplements, the new species strongly resembles *Metaxonchium coronatum* (DE MAN, 1906) COOMANS & NAIR, 1975. However, it differs from the sister species (as characterized by THORNE 1939, NAIR & COOMANS 1974, and POPOVICI 1990) by the smooth cuticle (*vs*. distinctly annulated), the neck-like narrowing behind the head, the presence of conspicuous lacunae on the neck region, the length and, particularly, by the shape of the long-necked spicula (96–104 *vs*. 78–87 μm, or 2.4–2.6 *vs*. 1.5–1.9 anal body diameters long), and by the presence of two supplements (*vs*. one) within the spicular range.

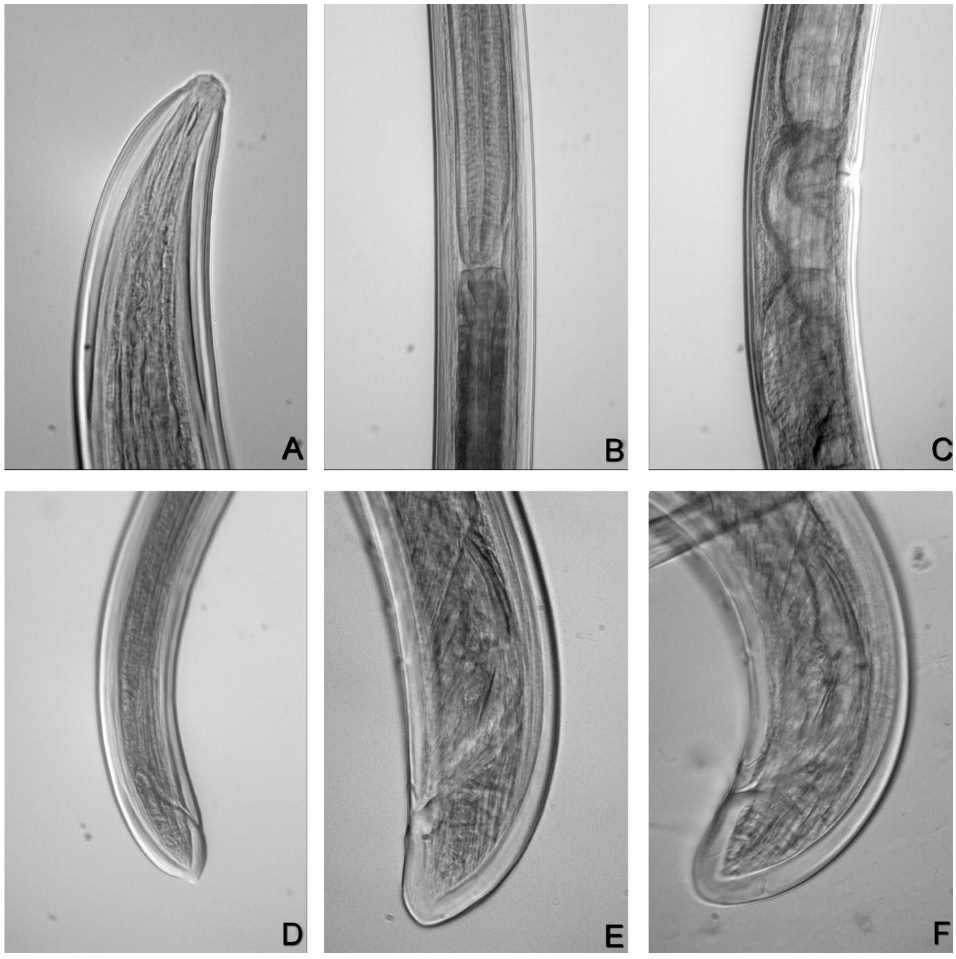


Fig. 6. *Metaxonchium nobile* sp. n. microphotos: A = anterior end, B = oesophago-intestinal junction, C = vulval region, D = female posterior end, E–F = male spicular region

In having so long-necked spicula, *Metaxonchium nobile* sp. n. is unique within the genus. Two species can be compared with it that have somewhat tapered spicula proximally, *M. macrophallum* THORNE, 1939 and *M. giennense* PEÑA-SANTIAGO et COOMANS, 1990. The new species is easily distinguished from them in the much longer (96–104 *vs*. 66–87 μm) and more strongly attenuated spicula, and by the non-echinulate uterus.

Etymology. Latin *nobile* meaning noble refers to the illustrious appearance of this species.

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