

Longidorus carpetanensis sp. n. and *L. unedoi* sp. n. (Nematoda : Longidoridae) from Spain

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SUMMARY

Two new longidorid species are described from Spain, *Longidorus carpetanensis* sp. n. from a soil around *Cytisus purgans* L. roots in Avila Province at a height of 1 500 m and *L. unedoi* sp. n. on *Quercus faginea* L. in Lérida Province and *Arbutus unedo* L. in Gerona Province. Both are characterized by their small to medium size, within the genus, an expanded lip region and conical tail with rounded tip; they can be distinguished from each other by the lip region and the amphidial pouches shape, body length, c index and vulval position. They resemble *L. pisi* Edward *et al.*, 1964, *L. monile* Heyns, 1966, *L. moniloides* Heyns, 1966 and *L. paramonile* s'Jacobs *et al.*, 1982. They differ from *L. pisi* in body and odontostyle lengths, lip region and shape of amphidial pouches and by the more anterior located guiding ring; from the other three species they differ in the shape of amphidial pouches and odontostyle and tail lengths.

RÉSUMÉ

Longidorus carpetanensis sp. n. et *L. unedoi* sp. n. (Nematoda : Longidoridae) provenant d'Espagne

Les auteurs décrivent et illustrent deux nouveaux Longidoridae, *Longidorus carpetanensis* sp. n., provenant de sol aux environs des racines de *Cytisus purgans* L., Province d'Avila à 1 500 m d'altitude, et *L. unedoi* sp. n. provenant de sol aux environs des racines de *Quercus faginea* L., Province de Lérida, et d'*Arbutus unedo* L., Province de Gerona. Ces nouvelles espèces sont caractérisées par l'expansion de la région labiale et la queue conique à extrémité arrondie. Les différences majeures entre les deux espèces intéressent la forme de la région labiale et celle des amphides, la longueur du corps, le coefficient c et la position de la vulve. Les deux espèces présentent une grande similitude avec *L. pisi* Edward *et al.*, 1964, *L. monile* Heyns, 1966, *L. moniloides* Heyns, 1966 et *L. paramonile* s'Jacobs *et al.*, 1982. L'une et l'autre espèces nouvelles se distinguent de *L. pisi* par les longueurs du stylet et du corps, la morphologie de la région labiale et celle des amphides et par la position du guide du stylet. Des autres trois espèces, elles se distinguent par la morphologie des amphides, la longueur de l'odontostyle et celle de la queue.

During a nematological survey made in Spain, populations of two nematode belonging to two undescribed species of the genus *Longidorus* Micoletzky, 1922 were found. They are described below under the names *L. carpetanensis* sp. n., because they appeared in Carpetanian Region, and *L. unedoi* sp. n. as one of its host-plant is *Arbutus unedo* L., a characteristic plant from Mediterranean Region.

Material and methods

Specimens were separated from the soil by the method of Flegg (1967), killed and fixed and mounted in dehydrated glycerine by De Grisse (1966) techniques.

Longidorus carpetanensis sp. n. (Fig. 1)

MEASUREMENTS

Females (n = 13) : L = 4.2 mm (3.5-4.4); a = 110

(96-118); b = 13 (11-16); c = 84 (77-96); c' = 1.8 (1.6-2.2); V = 48.8 (45-51); odontostyle = 59 μ m (54-65), odontophore = 41 μ m (35-47); oa-gr* = 23.8 μ m (22-26.5); b/l** = 1.7 (2-1.6).

Males (n = 11) : L = 4 mm (3.8-4.8); a = 113 (104-125); b = 13 (10-15); c = 84 (77-98); c' = 1.8 (1.5-2); T = 46 % (43-52); odontostyle = 43 μ m (36-47), odontophore = 43.2 μ m (36-47); oa-gr = 25.5 μ m (24-26); b/l = 1.7 (2-1.5); esp. = 36.5 μ m (34-38.4).

Juveniles 4th stage (n = 4) : L = 3 mm (2.9-3.2); a = 92 (83.5-100); b = 10.8 (9.8-11.8); c = 59.5 (48.7-67.6); c' = 2.4 (2.2-3.3); odontostyle = 53.6 μ m (52-55); odontophore = 36 μ m (30-39); repl. odontostyle = 62 μ m (58-65).

Holotype (female) : L = 3.9 mm; a = 107; b = 13; c = 87.8; c' = 1.6; V = 51; odontostyle = 60 μ m; odontophore = 35 μ m; oa-gr = 23 μ m; b/l = 1.6

* oa-gr = dist. from anterior end to guiding ring.

** b/l = body diam. at guiding ring level/labial area diam.

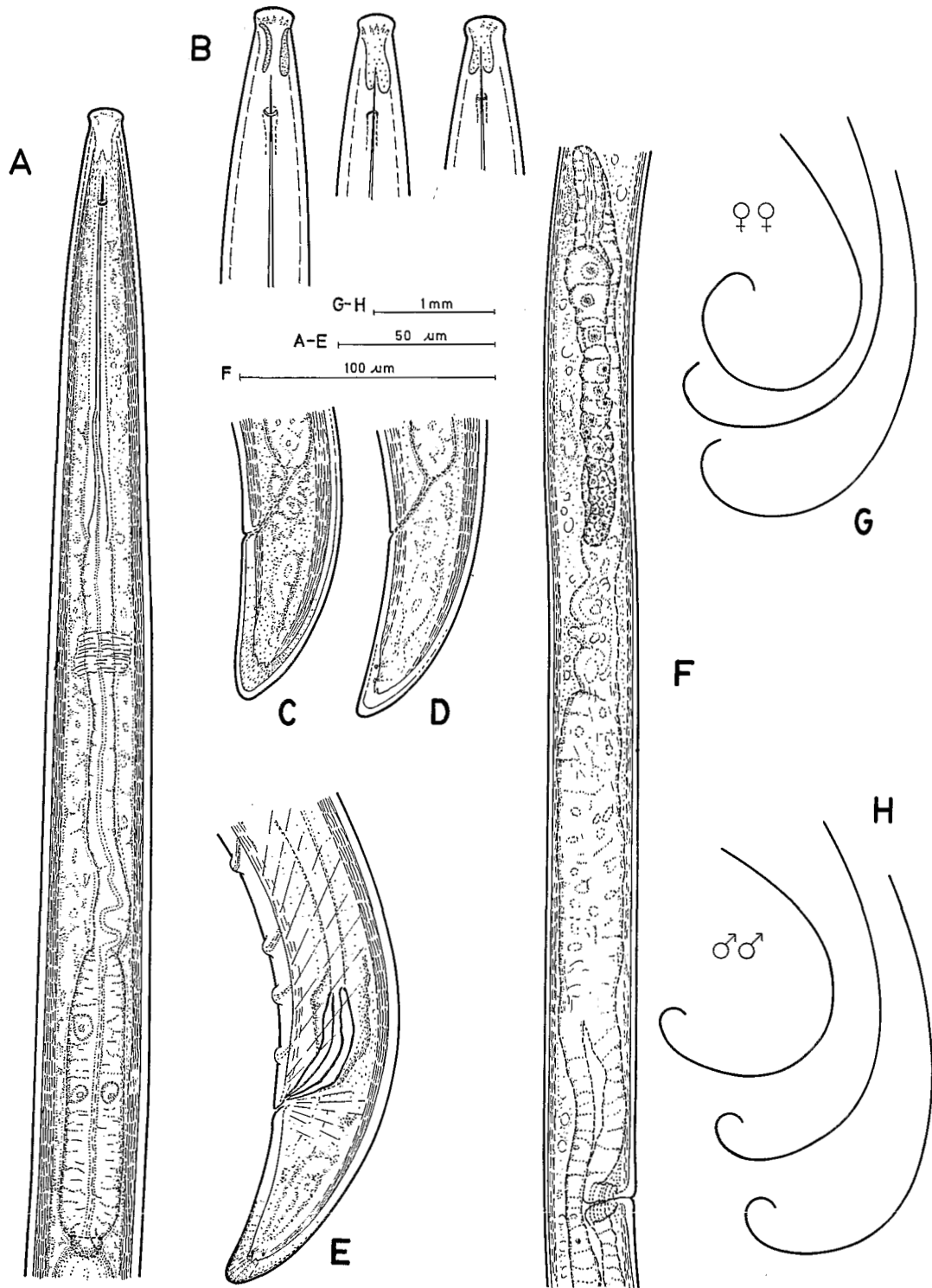


Fig. 1. *Longidorus carpetanensis* sp. n. A : Anterior part of body; B : Lip region lateral view and variation in shape of lip region; C : Tail of female; D : Tail of juveniles; E : Tail of male; F : Sexual system of female; G-H : Relaxed body habit.

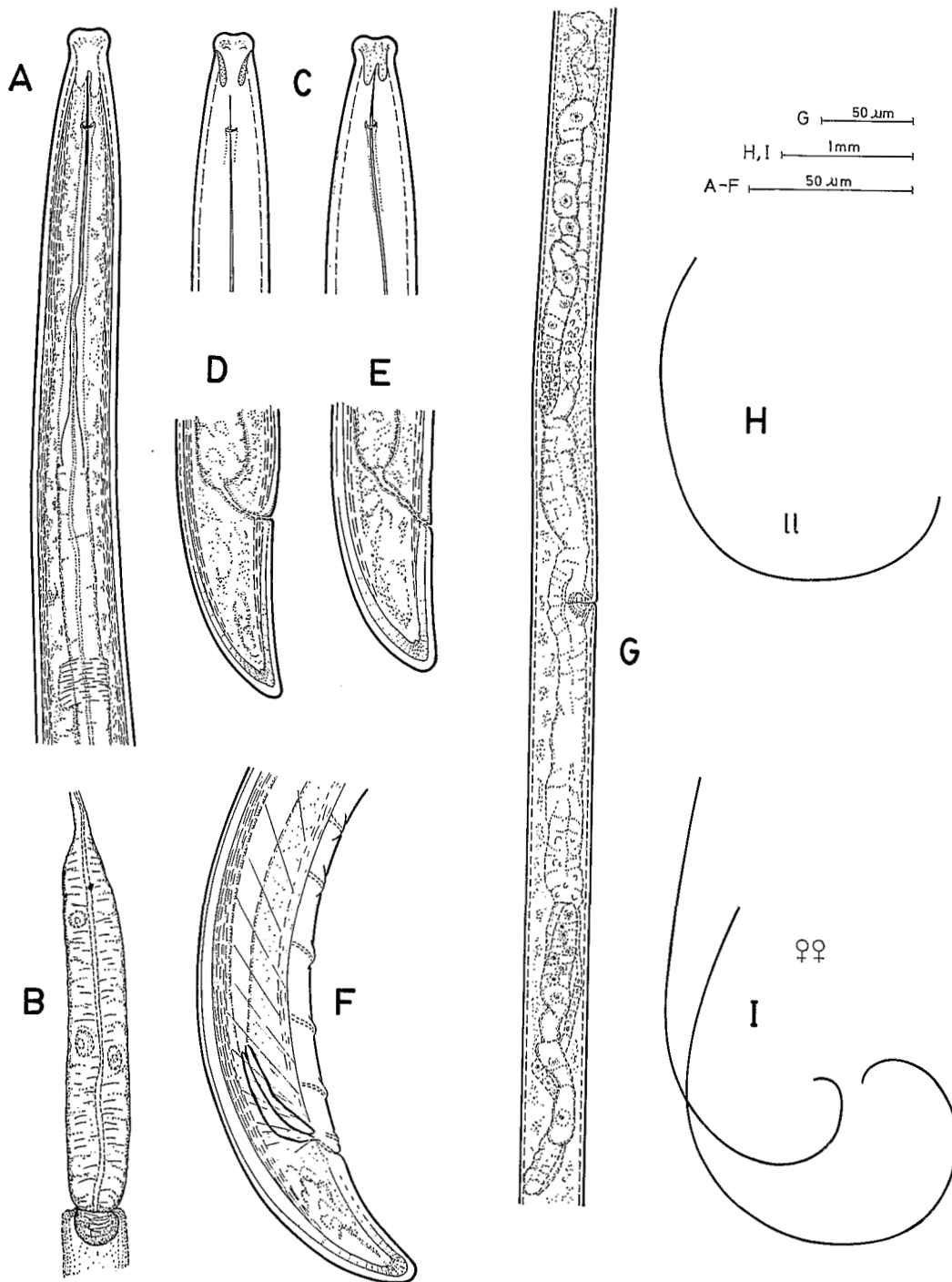


Fig. 2. *Longidorus unedoi* sp. n. A : Anterior part of body; B : Oesophageal bulb; C : Lip region lateral view and variation in shape of lip region; D : Tail of juveniles; E : Tail of female; F : Tail of male; G : Sexual system of female; H-I : Relaxed body habit.

DESCRIPTION

Female: Body long and thin, almost cylindrical, gradually tapering towards both extremities, more abruptly in the anterior part. When heat relaxed, body ventrally curved in open C. Cuticle thin (about 2 µm at mid-body), apparently composed of two layers, thickened in the neck region at the base of lip area (2.5 µm) and in tail region (8.5 µm at tail tip) fine radial striations are present. Lateral hypodermal chords appear as a line at amphids level, they widen to reach 1/3 of body diameter in midbody and decrease to 1/4 of body caudal width. Body pores not observed in anterior region, only three ventromedian pairs present in tail region, behind the anus. Lip region anteriorly rounded, slightly separated from the rest of the body, with two conspicuous series of labial and cephalic papillae. Amphids pouch like, large, bilobed, with more or less symmetrical lobes reaching about 3/4 of anterior end-guiding ring distance; amphid aperture a small pore. Hemizonid flat, poorly developed, often inconspicuous. Hemizonion not observed. Stylet in two parts, odontostyle long and thin, often smoothly wavy and odontophore, less refractive, with a length of about 2/3 of that of the odontostyle. Junction between odontostyle and odontophore plain, not forked. Stylet guiding ring situated at 24 µm from anterior end. Oesophagus typical of the genus with anterior part narrow, cylindrical and more or less coiled; in some specimens the nerve ring at 1/3 of oesophageal length from the anterior end, oesophageal bulb measuring about 84 × 14 µm (79-86 × 13-15), about 1/4 of the total oesophageal length; dorsal oesophageal gland nucleus located at 12.6 µm (17-15.3) from anterior end, in the first third of the bulb; subventral gland nuclei situated anterior to mid-length of the bulb. Cardia well developed, globular (7.6-5.5 µm). Rectum short, well cuticularized. Vulva a transverse slit, slightly anterior to mid-body. Vagina reaching about 25 µm, about half body diameter, cuticularized, with circular muscles flat. Two genital branches amphidelphic and retrorse, with similar structure and length 46 µm (43-51) — about 10% (7-13%) of body length — are present. Uterus and oviduct long, cylindrical and with sperms. Ovary reflexed, oocytes in one row at the junction with the oviduct. Tail long, conical, dorsally convex with rounded terminus; cuticle thick (8.5 µm) at the tip, showing five radial striations on the internal layer. Three pairs of ventromedian caudal pores and papillae are present.

Male: Body curved, strongly in caudal region. Anterior part similar to female. Tail long conical, dorsally convex with rounded terminus, thick cuticle and subcuticle with fine striations. Two pairs of caudal papillae. Curved spicules 37 µm (34-38) long along their median line. Ventromedian supplements, 9-11 in number.

Juveniles 4th stage: Morphology and anatomy similar to those of the females Curvature of body less pronon-

ced. Tail longer than in female, with three pairs of pores as in adults.

TYPE SPECIMENS

Holotype (female) deposited at the Instituto de Edafología y Biología Vegetal. Madrid.

Paratypes: 11 females, 9 males and 3 juveniles 4th stage at same place and one slide with 1 female, 1 male and 3 juveniles in the collection of the Muséum national d'Histoire naturelle of Paris.

TYPE LOCALITY

Soil, around roots of *Cytisus purgans* L., at 20 cm depth, in Puerto de Naval Moral at 1 500 m of height in Naval Moral (Avila).

DIFFERENTIAL DIAGNOSIS

Longidorus carpetanensis sp. n. is characterized by its medium size, slightly expanded and set off lip region and conico-cylindrical tail with a rounded tip. It resembles *L. pisi* Edward *et al.*, 1964; *L. monile* Heyns, 1966; *L. moniloides* Heyns, 1966 and *L. paramonile* Jacobs *et al.*, 1982. According to Brown, Hooper and Saka (1982), it differs from *L. pisi* by the position of the guiding ring (oa-gr = 22-27 µm vs 36-42 µm in *L. pisi*), smaller odontostyle (54-56 µm vs 68-86 µm); shape of lip region, cylindrical in *L. carpetanensis*, amphidial pouches shape and absence of flanges in odontophore. From the other three species it differs in the amphidial pouches shape, smaller odontostyle and longer tail (small c index and larger c' index).

Longidorus unedoi sp. n.

(Fig. 2)

MEASUREMENTS

Females from Lérida (n = 4): L = 5.4 mm (5-6); a = 134.6 (165.8-121); b = 15 (13-19); c = 134 (122-156); c' = 1.6 (1.4-2); V = 54 (52-58); odontostyle = 59 µm (52-64); odontophore = 45 µm (42-53); oa-gr = 25 µm (24-26.5); b/l = 1.5 (1.5-1.7).

Males from Gerona (n = 2): L = (5.4-5.6); a = (150-190); b = (12-21); c = (131-134); c' = (1.7-2); T = (50-56%); odontostyle = (63-66 µm); odontophore = (43-48 µm); oa-gr = 25 µm; b/l = 1.5; esp. = 35 µm.

Juveniles 4th stage from Lérida (n = 3): L = 3.6 mm (3.4-3.8); a = 117 (108-126); b = 10.7 (10-11); c = 81 (80-85); odontostyle = 56 µm (55.5-57); odontophore = 41.6 µm (40-43); repl. odontostyle = 61.5 µm (60-64).

Juveniles 4th stage from Gerona (n = 1): L = 3.8 mm; a = 120; b = 18; c = 87.4; odontostyle = 56 µm; odontophore = 40 µm; repl. odontostyle = 63 µm.

Juveniles 3rd stage from Lérida (n = 1): L = 3 mm; a = 69; b = 10.5; c = 68.5; odontostyle = 49 µm; odontophore = 31.6 µm; repl. odontostyle = 55 µm.

Holotype (female): L = 5 mm; a = 128; b = 13.5; c = 130; c' = 1.4; V = 52; odontostyle = 52 µm; odontophore = 45 µm; oa-gr = 24 µm; b/l = 1.5.

DESCRIPTION

Female: Body almost cylindrical tapering to both ends; when heat-relaxed, body ventrally curved in open C and strongly in the third posterior part of the body. Cuticle smooth, composed of two layers, thin (2 µm at mi-body), slightly thicker in neck region (2.5 µm) and more at caudal end (7.7 µm) where tail tip shows fine radial striations. Pores not seen. Lateral hypodermical chords have been observed along the body. Lip region truncated, expanded and set off, 9.4 µm wide at the top, 8.6 µm in the neck region and 14.5 µm at guiding ring level. Amphids well developed, pouch shaped, asymmetrically bilobed that reach 2/3 of distance between oral aperture and guiding ring. Amphidial apertures, hemizonid and hemizonion not seen. Stylet typical of the genus, odontostyle long and thin very refractive, often curved, odontophore less refractive with a length of about half of total stylet length. Junction between odontostyle and odontophore plain. Guiding ring situated in the anterior part of odontostyle at 25 µm (24-27) from oral aperture. Oesophagus also typical of genus with anterior part narrow, slender, more or less coiled, nerve ring at 162 µm from anterior end; oesophageal bulb with a dimension of 94-15 µm occupying 1/3 of total oesophagus length. Nucleus of dorsal oesophageal gland 12 µm behind dorsal gland duct, in the anterior third of bulb; nuclei of subventral glands a little posterior to mid oesophagus bulb. Cardia well developed, globular (11 × 7 µm). Rectum long and cuticularized. Vulva a transverse slit, slightly posterior to mid-body (52-58 %). Vagina extending to more than half of body diameter at this level (16 µm), with thick cuticular lining and circular muscles. Two amphidelphic, reflexed genital branches of about the same length (330 µm, G = 10-7 %) and of same structure present. Uterus and oviduct long, cylindrical, without sperm, ovary reflexed with one row of oocytes at its junction with oviduct. Tail long, conical, convex, 38 µm in length and 25.6 µm wide, bluntly rounded, cuticle at the tip 7.7 µm thick, with fine radial striations on the internal layer.

Male: Similar to female, tail more strongly curved ventrally, conical, long with rounded tip, cuticle and subcuticle thickened (6 µm) with fine radial striations on the internal layer. Two pairs of caudal papillae present.

Curved spicules, 35 µm long (equal in the two males, as well as "oa-gr" and "b/l" indexes), supplements consist of one adanal pair and a series of nine ventromedian situated equidistantly.

Juveniles: Habit more straight than female. Morphology and anatomy similar to the adults, except in the genital tract. Tail more elongated.

TYPE SPECIMENS

Holotype (female) deposited at the Instituto de Edafología y Biología Vegetal. Madrid.

Paratypes: 2 females, 2 males, 4 juveniles 4th stage and 1 juvenile 3rd stage at same place and 1 female in the collection of the Muséum national d'Histoire naturelle of Paris.

TYPE LOCALITY

Soil around roots of *Quercus faginea* L., at 30 cm depth, in Tora, Lérida, Spain.

OTHER LOCALITY

Soil around of roots of *Arbutus unedo* L., at 30 cm depth in Romanya de la Selva (Gerona).

DIFFERENTIAL DIAGNOSIS

Longidorus unedoï sp. n. resembles *L. carpetanensis* sp. n. in its medium body size, set off expanded lip region and conical tail with rounded tip. They can further be differentiated by the longer size of *L. unedoï* sp. n. (5.6 vs 3.5-4.4), Thinner body (a = 122-156 vs 96-118; high c index (122-156 vs 77-96); more posteriorly located vulva (V = 52-58 % vs 45-51 %) and expanded lip region. These can also be differentiated by asymmetrical amphidial lobes and more anteriorly located oesophageal ventral gland nucleus in *L. unedoï* sp. n.

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