

Longidorus silvae sp. n. (Nematoda : Longidoridae) from Italy

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Summary – *Longidorus silvae* sp. n. is described and illustrated. It was found in natural habitat, woodland, at Ampezzo, province of Udine and at Palazzetto, province of Siena, Italy. The new species is similar to *L. goodeyi* Hooper, 1961, *L. major* Roca & D'Errico, 1987 and *L. picens* Roca, Lamberti & Agostinelli, 1985. *L. silvae* sp. n. is characterized by the lip region continuous with the rest of the body, unevenly bilobed amphidial pouches; the female tail is short and rounded and the first larval stage has a long tail mucro.

Résumé – *Longidorus silvae* sp. n. (Nematoda : Longidoridae) provenant d'Italie – *Longidorus silvae* sp. n. est décrit et figuré. Cette nouvelle espèce a été récoltée dans des sites naturels de forêt, à Ampezzo (Province d'Udine) et à Palazzetto (Province de Sienne), Italie. Proche de *L. goodeyi* Hooper, 1961, *L. major* Roca & D'Errico, 1987 et *L. picens* Roca, Lamberti & Agostinelli, 1985. *L. silvae* sp. n. est caractérisé par la présence de poches amphidiennes à lobes inégaux, la région labiale continue avec le reste du corps, la queue courte, arrondie, sub-hémisphérique et, chez le juvénile de premier stade, une queue pourvue d'un long mucron.

Key-words : *Longidorus*, nematodes.

During a survey of longidorid nematodes made in the Italian regions, populations of an undescribed species of the genus *Longidorus* Micoletzky, 1922 were found in Friuli Venezia Giulia, northern, and Tuscany, central Italy. It is described below under the name *L. silvae* sp. n., because it was found in soil samples collected from woodland, a natural habitat at Ampezzo, province of Udine and at Palazzetto, province of Siena.

Nematodes were extracted from soil samples by the Cobb's wet sieve technique, killed and fixed in hot 5 % formalin, processed to glycerol by the slow method and mounted on slides. Specimens were measured with the aid of a camera lucida.

Longidorus silvae sp. n.

(Fig. 1)

MEASUREMENTS

Holotype, females and juveniles : see Table 1.

DESCRIPTION

Female : Habitus in specimens killed by gentle heat as open C, almost straight anteriorly and curved behind the vulva. Body cylindrical, tapering gradually anteriorly and slightly widened just anteriorly to the anus on the ventral side. Cuticle apparently smooth along the body, but with very fine transverse striae, visible only on the tail region. Cuticle 3.5-4 µm thick along the body, more thickened in the neck region, where it measures 5.5-6 µm at the base of the lip region, and in the caudal region where it is 8.5-9 µm ventrally and 9-9.5 µm dorsally in the post anal region. Lateral hypodermal cords well visible throughout the length of the body, 17.5-

19 µm wide at mid-body or 26-27 % of the corresponding body diameter. Lateral body pores, three in the range of the odontostyle, arranged in a single row in the neck region and in the rest of the body, distributed irregularly along the lateral cords; five ventral body pores, no dorsal, are visible anteriorly, three opposite the odontostyle and one opposite the odontophore. Lip region subacute, flattened frontally and continuous with the rest of the body, with prominent labial sensillae; amphid long and bilobed, with the ventral lobe the longer, occupying slightly more than half the distance of guiding ring from anterior end, with pouches enlarged at the mid region and sinus very deep; amphidial pore indistinct. Guiding ring 4-4.5 µm wide; odontostyle long and slender, odontophore enlarged at the base. Nerve ring wide, at a distance of 30-35 µm from the base of the odontophore; oesophagus dorylaimoid with pharyngeal bulb cylindrical, containing three gland nuclei about equal in size : the two subventral nuclei situated at almost the same level in the middle of the bulb, the dorsal nucleus situated about half way from the beginning of the bulb to the subventral ones. Pharyngo-intestinal valve inconspicuous, heart-shaped, surrounded by intestinal tissue. Vulva a transverse slit, vagina heavily cuticularized, extending more than half the body width. Ovejector weakly muscularized, separated at each extremity from the uterus by a slight constriction; uterus long and stout, not differentiated with a wide lumen separated from the oviduct by a robust sphincter; pouch of the oviduct long and wide, tubular portion slender and ovary without any special features. Tail short, rounded to almost hemispherical, curved ventrally with main curvature dorsally; bearing two caudal pores on each side.

Table 1. *Morphometrics of Longidorus silvae* sp. n. (*paratypes*) (all measurements in μm , except *L*).

	Holotype	Females	J1	J2	J3	J4
n	1	11	13	12	16	11
L (mm)	7.5	6.9 $\pm$ 0.70 * (5.9-8.0) **	1.9 $\pm$ 0.18 (1.7-2.3)	2.6 $\pm$ 0.19 (2.3-2.9)	3.5 $\pm$ 0.39 (2.9-4.1)	4.9 $\pm$ 0.42 (4.1-5.4)
a	108.0	99.4 $\pm$ 10.34 (87.5-123.5)	69.3 $\pm$ 5.94 (61.2-79.5)	72.5 $\pm$ 5.21 (63.0-80.5)	82.0 $\pm$ 6.67 (72.5-94.5)	93.5 $\pm$ 8.04 (78.2-107.2)
b	11.4	12.7 $\pm$ 1.48 (11.0-16.3)	6.4 $\pm$ 1.1 (4.5-7.9)	7.3 $\pm$ 1.06 (6.2-9.7)	9.3 $\pm$ 1.63 (6.6-12.8)	10.5 $\pm$ 1.48 (8.4-12.9)
c	182.0	166.7 $\pm$ 20.27 (132.0-189.0)	31.4 $\pm$ 2.7 (27.6-36.5)	64.0 $\pm$ 5.0 (53.4-71.2)	80.0 $\pm$ 10.99 (63.0-96.5)	112.3 $\pm$ 10.18 (94.6-126.3)
c'	0.76	0.79 $\pm$ 0.04 (0.72-0.84)	2.95 $\pm$ 0.2 (2.5-3.3)	1.4 $\pm$ 0.13 (1.2-1.6)	1.2 $\pm$ 0.15 (1.0-1.5)	0.9 $\pm$ 0.1 (0.8-1.1)
V	46.3	48.6 $\pm$ 1.74 (44.9-50.7)	...	...	...	...
Lip reg. width	16.0	15.0 $\pm$ 0.89 (14.0-17.0)	7.5 $\pm$ 0.74 (6.5-9.0)	9.0 $\pm$ 1.01 (7.0-11.0)	10.0 $\pm$ 1.01 (8.0-11.5)	12.5 $\pm$ 0.85 (10.0-13.0)
Lip reg. height	5.5	5.0 $\pm$ 0.56 (4.5-6.5)	2.5 $\pm$ 0.39 (1.5-3.0)	3.0 $\pm$ 0.35 (2.5-3.5)	3.0 $\pm$ 0.42 (2.5-3.5)	3.5 $\pm$ 0.54 (3.0-4.5)
Odontostyle	128.0	122.5 $\pm$ 5.47 (113.5-133.0)	75.5 $\pm$ 2.05 (70.5-78.0)	80.5 $\pm$ 3.13 (72.5-83.0)	94.0 $\pm$ 7.77 (83.0-104.5)	111.5 $\pm$ 3.21 (107.0-117.5)
Odontophore	57.5	54.5 $\pm$ 6.61 (44.5-70.0)	30.5 $\pm$ 3.35 (26.0-36.0)	40.5 $\pm$ 3.26 (32.0-44.5)	45.0 $\pm$ 5.32 (30.0-51.5)	51.5 $\pm$ 4.04 (47.0-57.5)
Tot. stylet	186.0	177.0 $\pm$ 10.28 (164.5-198.0)	106.0 $\pm$ 3.55 (101.0-113.0)	121.0 $\pm$ 4.52 (112.5-127.5)	139.0 $\pm$ 11.14 (114.0-156.5)	163.0 $\pm$ 5.66 (155.5-173.5)
Repl. odontostyle	...	...	82.0 $\pm$ 2.0 (78.0-85.5)	98.0 $\pm$ 4.73 (83.0-104.5)	107.5 $\pm$ 6.5 (94.5-117.5)	124.5 $\pm$ 3.86 (119.0-131.5)
Guide ring	36.0	40.0 $\pm$ 2.25 (37.0-44.0)	26.0 $\pm$ 1.1 (24.5-27.5)	27.0 $\pm$ 3.38 (17.5-29.5)	31.5 $\pm$ 2.29 (27.0-35.5)	36.5 $\pm$ 1.55 (34.0-39.5)
Phar. bulb length	167.0	152.5 $\pm$ 11.28 (135.5-169.0)	87.0 $\pm$ 3.8 (81.0-94.5)	102.0 $\pm$ 9.55 (79.5-115.5)	115.0 $\pm$ 12.42 (91.5-134.0)	135.0 $\pm$ 6.08 (126.5-144.0)
Phar. bulb width	26.5	24.0 $\pm$ 3.69 (17.5-32.5)	14.5 $\pm$ 0.71 (13.5-16.0)	17.0 $\pm$ 0.71 (16.0-18.0)	19.5 $\pm$ 1.82 (14.5-21.5)	22.5 $\pm$ 0.61 (21.0-23.0)
Ant. gen. branch	576.5	668.5 $\pm$ 80.5 (547.0-859.0)	...	...	...	...
Post. gen. branch	529.5	632.0 $\pm$ 122.5 (500.0-941.0)	...	...	...	...
Ant. gen. branch %	7.7	9.8 $\pm$ 1.4 (7.6-13.0)	...	...	...	...
Post gen. branch %	7.0	9.3 $\pm$ 2.0 (7.2-14.2)	...	...	...	...
Body diam. mid-body	69.5	69.0 $\pm$ 4.1 (63.0-77.0)	28.0 $\pm$ 2.5 (23.0-33.0)	36.0 $\pm$ 2.76 (32.5-41.5)	43.5 $\pm$ 3.31 (37.0-49.5)	52.5 $\pm$ 3.43 (47.5-59.5)
Body diam. anus level	54.0	52.5 $\pm$ 2.34 (49.0-57.0)	21.0 $\pm$ 1.28 (19.0-23.5)	29.5 $\pm$ 2.14 (27.0-34.0)	36.5 $\pm$ 3.53 (29.5-40.5)	45.5 $\pm$ 2.70 (41.5-49.5)
Rectum	43.0	40.0 $\pm$ 2.96 (36.5-44.5)	16.0 $\pm$ 2.07 (13.0-21.0)	19.5 $\pm$ 2.28 (14.5-22.5)	23.5 $\pm$ 2.35 (19.5-26.5)	30.5 $\pm$ 1.64 (28.0-33.0)
Tail	41.0	41.5 $\pm$ 2.7 (37.0-44.5)	61.5 $\pm$ 3.51 (57.0-66.5)	40.5 $\pm$ 3.08 (35.5-46.0)	45.0 $\pm$ 4.55 (38.0-52.5)	44.0 $\pm$ 2.5 (40.5-48.0)
Hyaline tail tip	13.5	14.0 $\pm$ 1.09 (12.5-16.0)	6.5 $\pm$ 1.14 (4.5-8.5)	7.5 $\pm$ 0.95 (6.0-9.0)	9.5 $\pm$ 1.67 (6.0-11.5)	10.5 $\pm$ 1.3 (9.5-13.5)
Mucro	...	...	22.5 $\pm$ 2.43 (20.0-27.0)	...	...	...
Prerectum	588.0	522.0 $\pm$ 109.1 (388.0-729.5)	263.2 $\pm$ 31.05 (206.0-306.0)	311.5 $\pm$ 69.26 (176.5-400.0)	308.0 $\pm$ 47.49 (217.5-400.0)	421.5 $\pm$ 80.97 (306.0-576.5)

* Mean and standard deviation.

** Range.

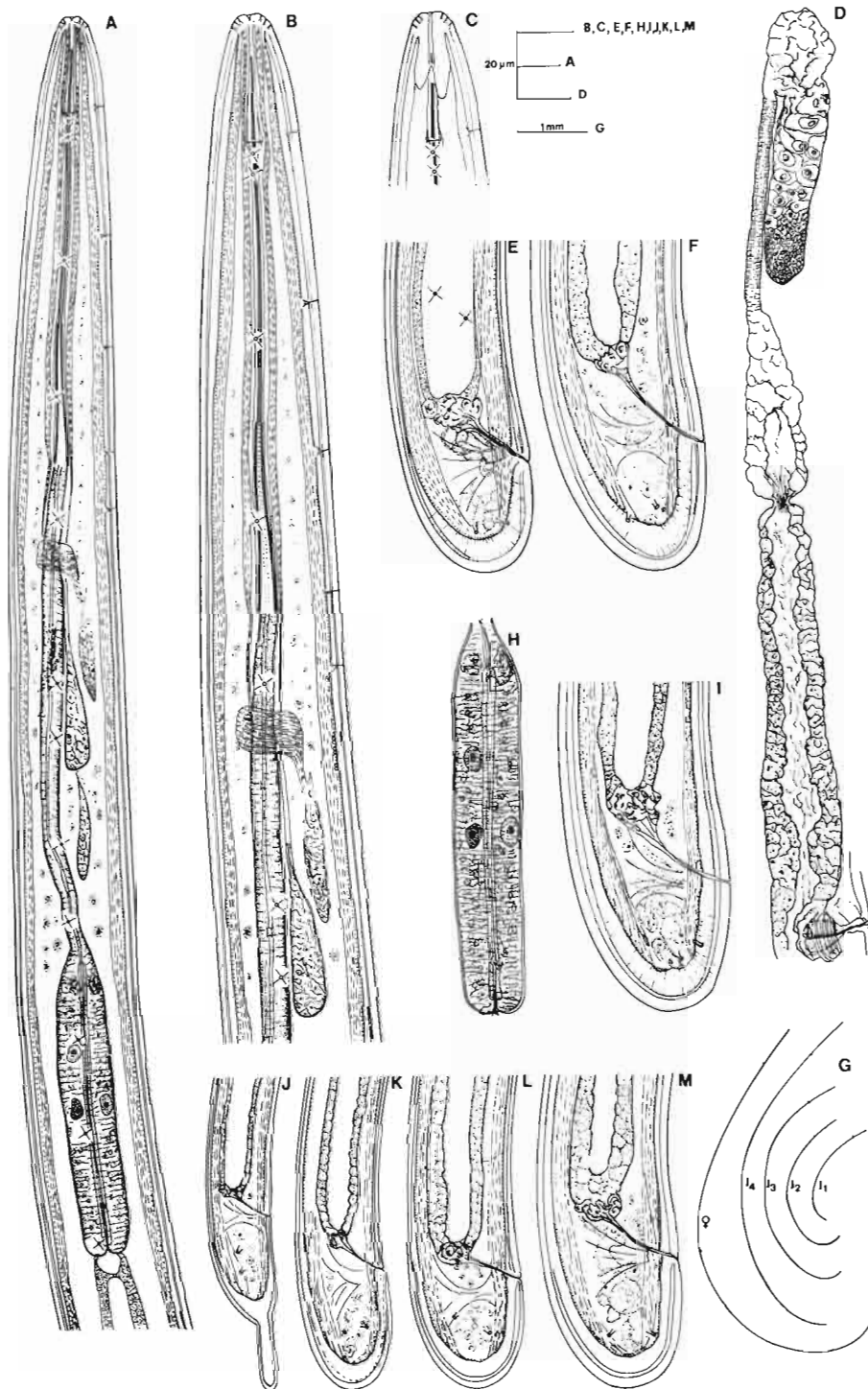


Fig. 1. *Longidorus silvae* sp. n. A, B : Female, anterior region; C : Head end (surface view); D : Anterior branch of the genital tract; E : Female posterior region (population from Palazzetto, Tuscany); F, I : Female posterior region (type population; I, holotype); H : Oesophageal bulb; J-M : Posterior region of juveniles, J1-J4 respectively; G : Posture of juveniles and adult stages.

Male : not found.

Juveniles : Morphologically similar to adult but smaller; tail of first stage elongate-conoid with a long mucro, and bearing two caudal pores on each side.

TYPE HOST AND LOCALITY

Natural habitat, woodland, at Ampezzo, province of Udine, Italy. Other population at Palazzeto, province of Siena, Tuscany, Italy.

TYPE SPECIMENS

Holotype, eight paratype females and juveniles in the Collection of the Istituto di Nematologia Agraria del Consiglio Nazionale delle Ricerche, Bari, Italy; one paratype female in the following collections : Muséum National d'Histoire Naturelle, Laboratoire de Biologie Parasitaire, Protistologie, Helminthologie, Paris, France; Entomology and Nematology Department, Rothamsted Experimental Station, Harpenden, Herts, England; Plant Nematology Laboratory Collection, United States Department of Agriculture, Beltsville, Maryland, USA.

DIAGNOSIS AND RELATIONSHIPS

L. silvae sp. n. is characterized by the lip region continuous with the rest of the body, unevenly bilobed amphidial pouches, the female tail short and rounded to almost hemispherical and the first larval stage with a long tail mucro.

The new species is similar to *L. goodeyi* Hooper, 1961, *L. major* Roca & D'Errico, 1987 and *L. picenus* Roca, Lamberti & Agostinelli, 1985, in having lip region continuous with the rest of the body and tail of the first stage with a mucro. It differs from *L. goodeyi* in having slender body ("a" value 87.5-123.5 vs 67-117), anteriorly situated vulva ($V = 44.9-50.7\%$ vs 50-55%), longer odontostyle (113.5-133.0 vs 96-109 μm) and slightly shorter odontophore (44.5-70.0 vs 42-79 μm); from *L. major* in having shorter and slender body ($L = 5.9-8.0$ vs 8.5-12 mm and "a" value 87.5-123.5 vs 80.2-94.6), anteriorly situated vulva ($V = 44.9-50\%$ vs 49.4-54%), higher "c'" value (0.72-0.84 vs 0.5-0.7), slightly shorter odontostyle (113.5-133.0 vs 125.3-137.3 μm) and shorter tail (37-44.5 vs 42.6-60 μm) with longer mucro (20-27 vs 12-14.6 μm); from *L. picenus* in having slender body ("a" value 87.5-123.5 vs 80-90), shorter

odontostyle and odontophore (113.5-133.0 vs 131-146 μm and 44.5-70 vs 75-85 μm , respectively), anteriorly situated vulva ($V = 44.9-50.7\%$ vs 51-55%), higher "c'" value (0.72-0.84 vs 0.5-0.7) and absence of the male.

Similarities are also observed with *L. fasciatus* Roca & Lamberti, 1981, *L. iuglandis* Roca, Lamberti & Agostinelli, 1985 and *L. moesicus* Lamberti, Choleva & Agostinelli, 1983. *L. silvae* sp. n. differs from *L. fasciatus* in having more robust body ("a" value 87.5-123.5 vs 121-143), lower "c" ratio (133-189 vs 187-283), longer odontostyle (113.5-133 vs 102-119 μm) and longer distance of guide ring from the anterior end (37-44 vs 33-39 μm), and the tail of first stage with a long mucro, though juveniles are not reported in the original description (Roca & Lamberti, 1981); from *L. iuglandis* in having slender body ("a" value 87.5-123.5 vs 73-96), lower "c" ratio (132-189 vs 154-222), anteriorly situated vulva ($V = 44.9-50.7\%$ vs 51-57), shorter odontophore (44.5-70 vs 71-80 μm), the tail of first stage with a long mucro and absence of the males; and from *L. moesicus* in having anteriorly situated vulva ($V = 44.9$ vs 50-54), lower "c'" value (0.72-0.84 vs 0.8-1.2), longer odontophore (44.5-70.5 vs 59-66 μm), longer distance of oral opening to guide ring (37-44 vs 32-38 μm), the tail of first stage with a long mucro, though juveniles are not reported in the original description (Lamberti *et al.*, 1983), and absence of the males.

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