

## *Xiphinema belmontense* sp. n. (Nematoda : Longidoridae) from Portugal

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**Summary** — The authors give a description of *Xiphinema belmontense* sp. n. It was found in the rhizosphere of apple trees at Quinta da Torre, Colmeal da Torre, Belmonte, province of Beira Baixa, Portugal. The new species is similar to *X. aequum* Roca & Lamberti, 1988, *X. coxi coxi* Tarjan, 1964, *X. coxi europaeum* Sturhan, 1985, *X. dissimile* Roca et al., 1988, *X. diversum* Roca et al., 1989, *X. lusitanicum* Sturhan, 1983 and *X. pseudocoxi* Sturhan, 1985. *X. belmontense* is characterized by the pseudo-Z-organ, spiniform structures in the uterus and anteriorly situated vulva.

**Résumé** — *Xiphinema belmontense* sp. n. (Nematoda : Longidoridae) provenant du Portugal — Les auteurs donnent une description de *Xiphinema belmontense* sp. n. Cette nouvelle espèce a été prélevée dans la rhizosphère de pommier à Quinta da Torre, Colmeal da Torre, Belmonte, province de Beira Baixa, Portugal. *X. belmontense* sp. n. appartient au groupe des espèces à vulve antérieure, branches génitales également développées et pourvues d'une différenciation utérine (pseudo-organe Z et épines) et à queue conoïde, convexe dorsalement et pourvue d'une digitation terminale. La nouvelle espèce est proche de *X. aequum* Roca & Lamberti, 1988, *X. coxi coxi* Tarjan, 1964, *X. coxi europaeum* Sturhan, 1985, *X. dissimile* Roca et al., 1988, *X. diversum* Roca et al., 1989, *X. lusitanicum* Sturhan, 1983 et *X. pseudocoxi* Sturhan, 1985. *X. belmontense* sp. n. est caractérisé par la présence d'épines dans l'utérus et la position antérieure de la vulve.

**Key-words** : *Xiphinema*.

Soil samples were collected by Mrs. Ana Maria Monteigas and Mr. Acacio Pina at Quinta da Torre, Colmeal da Torre, Belmonte, province of Beira Baixa, Portugal. Specimens of *Xiphinema* were sent by Dr. Pereira to the Istituto di Nematologica Agraria as a suspected new species. Examination of this material by the senior author confirmed Dr. Pereira's opinion and the species is described here as *Xiphinema belmontense* sp. n.

Nematodes were extracted from soil samples by the Cobb wet sieve technique, killed and fixed in 5 % hot formalin and mounted in glycerin by the slow method.

### *Xiphinema belmontense* sp. n. (Fig. 1)

#### MEASUREMENTS

*Females, male and juveniles* : see Table 1.

*Holotype* (female) : L = 3.7 mm; a = 65; b = 7.8; c = 72; c' = 1.3; V = 39.7; odontostyle = 135.5 µm; odontophore = 76.5 µm; total stylet length = 212 µm; oral aperture to guiding ring = 123 µm; tail length = 51 µm; h (hyaline portion of the tail) = 16 µm; body diameter at lip region = 13 µm; body diameter at guiding ring = 40.5 µm; body diameter at base of oesophagus = 51 µm; body diameter at vulva = 56.5 µm; body diameter at anus = 39 µm; body diameter at beginning of h = 15.5 µm.

*Allotype* (male) : L = 3.7 mm; a = 64; b = 7.5; c =

69; c' = 1.3; odontostyle = 133.5 µm; odontophore = 77.5 µm; oral aperture to guiding ring = 123.5 µm; tail length = 53.5 µm; h = 22.5 µm; body diameter at lip region = 13.5 µm; body diameter at guiding ring = 41.5 µm; body diameter at base of oesophagus = 51 µm; body diameter at mid-body = 57.5 µm; body diameter at anus = 43 µm; body diameter at beginning of h = 20.5 µm; spicules = 92.5 µm; gubernaculum = 18.5 µm; cloaca to double papilla = 26 µm; double papilla to first supplement = 102.5 µm.

#### DESCRIPTION

*Female* : Habitus in specimens killed by gentle heat usually almost straight anterior to the vulva, more curved behind the vulva, with increasing curvature towards the tail end, occasionally C-shaped; body cylindrical, tapering very gradually towards the anterior extremity. Cuticle apparently smooth, 3-3.5 µm thick along the body, more thickened in the neck region, where it measures 4-4.5 µm at the base of the lip region, and in the caudal region where it is 6-6.5 µm ventrally and 8.5-9 µm dorsally in the post anal region. Lateral hypodermal cords readily visible throughout the length of the body, 15-16 µm wide at mid-body or 28-28.5 % of the corresponding body diameter; lateral body pores, 7-8 in the range of the odontostyle, arranged in a single row in the neck region and in a double row in the rest of the body from the level of the anterior end of the mid-intestine, distributed irregularly along the dorsal and ventral sides of the lateral cords; five dorsal and four

**Table 1.** Morphometrics of *Xiphinema belmontense* sp. n. (*paratypes*) (all measurements in  $\mu\text{m}$ , except L).

	J1	J2	J3	J4	Female	Male
n	4	14	8	28	25	14
L (mm)	1.3-1.6 (1.5 $\pm$ 0.17)	1.6-2.2 (1.9 $\pm$ 0.16)	2.3-2.5 (2.4 $\pm$ 0.07)	2.3-3.1 (2.6 $\pm$ 0.24)	3.1-4.7 (3.9 $\pm$ 0.38)	3.4-4.4 (3.9 $\pm$ 0.35)
a	46.2-54.4 (49.7 $\pm$ 3.52)	51.7-63.9 (56.0 $\pm$ 3.27)	56.8-66.2 (61.0 $\pm$ 3.51)	54.9-70.0 (61.9 $\pm$ 3.72)	58.4-72.3 (66.0 $\pm$ 3.49)	60.2-72.9 (65.8 $\pm$ 3.27)
b	4.5-5.5 (5.0 $\pm$ 0.46)	4.6-5.8 (5.1 $\pm$ 0.38)	5.2-5.9 (5.5 $\pm$ 0.25)	4.9-7.6 (5.8 $\pm$ 0.62)	6.7-9.3 (8.1 $\pm$ 0.67)	6.6-8.8 (7.8 $\pm$ 0.59)
c	21.6-27.2 (23.2 $\pm$ 2.70)	27.0-34.4 (30.1 $\pm$ 1.91)	38.7-45.8 (42.2 $\pm$ 2.68)	40.0-58.0 (46.5 $\pm$ 4.46)	63.1-96.7 (79.5 $\pm$ 6.96)	55.5-93.7 (76.9 $\pm$ 9.50)
c'	2.7-3.5 (3.1 $\pm$ 0.31)	2.3-3.0 (2.5 $\pm$ 0.20)	1.6-1.9 (1.8 $\pm$ 0.13)	1.3-2.2 (1.7 $\pm$ 0.19)	1.0-1.4 (1.2 $\pm$ 0.09)	1.0-1.5 (1.2 $\pm$ 0.13)
V	-----	-----	-----	-----	36.3-41.9 (39.2 $\pm$ 1.47)	-----
Odontostyle	64.1-82.3 (70.3 $\pm$ 8.35)	84.1-93.5 (88.3 $\pm$ 2.77)	93.5-108.8 (103.1 $\pm$ 5.96)	90.6-113.5 (107.6 $\pm$ 4.49)	125.9-140.6 (132.6 $\pm$ 3.87)	113.0-143.0 (133.1 $\pm$ 8.32)
Odontophore	41.2-53.0 (47.5 $\pm$ 5.11)	51.2-57.7 (54.3 $\pm$ 1.94)	59.4-68.8 (63.6 $\pm$ 2.82)	60.6-73.5 (65.6 $\pm$ 2.31)	70.0-115.3 (79.2 $\pm$ 8.29)	68.2-80.0 (75.1 $\pm$ 3.63)
Replacement odontostyle	87.0-104.1 (95.0 $\pm$ 8.10)	105.9-117.7 (110.9 $\pm$ 3.28)	121.2-130.6 (127.8 $\pm$ 3.17)	131.2-140.0 (135.3 $\pm$ 2.76)	-----	-----
Total spear length	106.5-132.4 (117.8 $\pm$ 11.86)	135.9-148.8 (142.6 $\pm$ 3.67)	158.8-177.7 (166.7 $\pm$ 6.31)	155.9-185.9 (173.2 $\pm$ 5.11)	200.6-245.3 (212.5 $\pm$ 9.63)	184.7-220.0 (208.2 $\pm$ 9.84)
Oral aperture to guiding ring	54.7-70.6 (61.8 $\pm$ 7.99)	71.2-85.3 (78.8 $\pm$ 3.57)	88.2-103.0 (96.0 $\pm$ 5.22)	94.1-107.0 (100.5 $\pm$ 3.34)	117.7-138.2 (126.0 $\pm$ 6.20)	111.2-139.4 (124.7 $\pm$ 7.14)
Tail length	57.0-77.0 (63.8 $\pm$ 9.09)	52.9-72.3 (63.7 $\pm$ 4.83)	52.3-61.8 (57.1 $\pm$ 2.86)	41.2-67.7 (56.4 $\pm$ 6.02)	40.0-56.5 (48.9 $\pm$ 4.21)	41.8-62.4 (50.8 $\pm$ 5.17)
h (hyaline portion of the tail)	14.7-20.6 (17.8 $\pm$ 2.69)	17.7-25.9 (21.1 $\pm$ 2.19)	13.5-24.1 (19.8 $\pm$ 3.56)	9.4-24.7 (20.7 $\pm$ 2.98)	10.0-24.7 (19.0 $\pm$ 2.79)	12.9-22.9 (18.8 $\pm$ 2.60)
Body diam. at lip region	5.9-8.8 (7.8 $\pm$ 1.39)	8.8-10.6 (9.4 $\pm$ 0.61)	10.6-12.4 (11.2 $\pm$ 0.66)	10.0-12.4 (11.2 $\pm$ 0.71)	12.4-13.5 (13.1 $\pm$ 0.50)	12.9-15.3 (13.9 $\pm$ 0.64)
Body diam. at guiding ring	19.4-24.1 (21.9 $\pm$ 2.06)	24.1-28.2 (26.0 $\pm$ 1.14)	30.6-34.7 (32.1 $\pm$ 1.29)	29.4-37.1 (32.7 $\pm$ 1.76)	38.2-44.1 (41.5 $\pm$ 1.72)	39.4-47.7 (42.6 $\pm$ 2.40)
Body diam. at base of oesophagus	27.1-30.6 (29.0 $\pm$ 1.62)	28.8-36.5 (32.9 $\pm$ 2.45)	34.1-42.4 (37.7 $\pm$ 2.52)	34.7-48.8 (40.1 $\pm$ 3.68)	45.3-57.7 (52.0 $\pm$ 3.46)	45.3-58.8 (52.7 $\pm$ 4.52)
Body diam. at mid body or vulva	27.1-32.4 (29.6 $\pm$ 2.37)	30.0-40.0 (34.2 $\pm$ 2.78)	35.9-44.1 (39.5 $\pm$ 2.75)	35.3-52.9 (42.3 $\pm$ 4.73)	51.2-65.9 (58.7 $\pm$ 4.25)	50.0-69.4 (59.0 $\pm$ 5.77)
Body diam. at anus	18.8-22.4 (20.4 $\pm$ 1.62)	22.4-28.8 (25.3 $\pm$ 2.20)	28.8-34.7 (31.9 $\pm$ 1.96)	29.4-37.6 (33.1 $\pm$ 2.46)	35.3-47.1 (41.2 $\pm$ 2.82)	40.0-48.2 (43.7 $\pm$ 2.50)
Body diam. at beginning of h	5.9-8.8 (7.5 $\pm$ 1.30)	8.2-11.8 (9.8 $\pm$ 1.12)	11.2-18.2 (14.7 $\pm$ 2.52)	11.8-21.2 (15.6 $\pm$ 2.42)	17.7-27.7 (22.0 $\pm$ 2.69)	13.0-29.4 (21.0 $\pm$ 3.87)
Spicules	-----	-----	-----	-----	-----	89.4-112.4 (94.9 $\pm$ 6.11)
Lateral guiding piece	-----	-----	-----	-----	-----	16.5-21.8 (19.1 $\pm$ 1.66)

ventral body pores in the range of the odontostyle. Labial region 12-13  $\mu\text{m}$  high, almost hemispherical, broadly rounded laterally and less so frontally, offset from the rest of the body by a shallow depression; amphids stirrup-shaped, with aperture a straight, transverse slit, occupying slightly more than four fifths of the lip region width, situated on the lip region at just less than two thirds of the lip region height. Odontostyle 2-2.5  $\mu\text{m}$  in diameter; odontophore well developed with

basal flanges 11-11.5  $\mu\text{m}$  wide and guiding "tube" well evident, variable in length from 12 to 16  $\mu\text{m}$ , with guiding ring 3.5-4  $\mu\text{m}$  wide. Oesophagus dorylaimoid with the anterior part tubular; basal enlarged portion 105-110  $\mu\text{m}$  long and 23-24  $\mu\text{m}$  wide, containing three nuclei well evident: the dorsal located at the beginning of the oesophageal bulb, the two subventral almost at the middle of the glandular oesophagus; oesophageal-intestinal valve inconspicuous, surrounded by intestinal





