

Xiphinema abrantinum sp. n. (Nematoda : Longidoridae) from Portugal

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SUMMARY

Xiphinema abrantinum sp. n. is described and illustrated. It was found in the rhizosphere of peach (*Prunus persica* Stokes) at Casal Coelheira, Tramagal, Abrantes, province of Ribatejo, Portugal. The new species is similar to *X. dissimile* Roca, Pereira & Lamberti, 1988, *X. israeliae* Luc, Brown & Cohn, 1982, *X. meridianum* Heyns, 1971, *X. sahelense* Dalmaso, 1969 and *X. coxi europaeum* Sturhan, 1985. *X. abrantinum* is characterized by the pseudo-Z-organ and one rudimentary ventro-median single supplement in the male.

RÉSUMÉ

Xiphinema abrantinum sp. n. (Nematoda : Longidoridae) provenant du Portugal

Xiphinema abrantinum sp. n. est décrit et figuré. Cette nouvelle espèce a été prélevée dans la rhizosphère de pêcher (*Prunus persica* Stokes) à Casal Coelheira, Tramagal, Abrantes, province de Ribatejo, Portugal. *X. abrantinum* sp. n. appartient au groupe des espèces à vulve médiane, branches génitales également développées pourvues d'une différenciation utérine (pseudo-organe « Z »), queue conoïde convexe dorsalement et arrondie à son extrémité. Cette espèce est proche de *X. dissimile* Roca, Pereira & Lamberti, 1988, *X. israeliae* Luc, Brown & Cohn, 1982, *X. meridianum* Heyns, 1971, *X. sahelense* Dalmaso, 1969 et *X. coxi europaeum* Sturhan, 1985. *X. abrantinum* sp. n. est caractérisé par le pseudo-organe « Z » et un seul supplément, rudimentaire, chez le mâle.

Specimens of *Xiphinema* collected by Mr. M. Marques de Matos at Casal Coelheira, Tramagal, Abrantes, province of Ribatejo, Portugal, were sent by Dr. M. J. Pereira to the Istituto di Nematologia Agraria as a suspected new species. Examination of this material confirmed Dr. Pereira's opinion and the species is described here as *Xiphinema abrantinum* 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 on nematology slides by the slow method. Specimens were measured with the aid of a camera lucida.

Xiphinema abrantinum sp. n.

(Figs 1, 2)

MEASUREMENTS

Female, male and juveniles : see Table 1.

Holotype (female) : L = 3.5 mm; a = 85; b = 7.3; c = 84; c' = 1.4; V = 46.7; odontostyle = 123.5 µm; odontophore = 72 µm; total spear length = 195.5 µm; oral aperture to guiding ring = 111.5 µm; tail length = 42.5 µm; h (hyalin portion of the tail) = 16 µm; body

diameter at lip region = 14.5 µm; body diameter at guiding ring = 34 µm; body diameter at base of oesophagus = 36.5 µm; body diameter at vulva = 42 µm; body diameter at anus = 29.5 µm; body diameter at beginning of h = 13.5 µm.

Allotype (male) : L = 3.7 mm; a = 88.5; b = 8.7; c = 81.5; c' = 1.5; odontostyle = 124 µm; odontophore = 66.5 µm; total spear length = 190.5 µm; oral aperture to guiding ring = 112.5 µm; tail length = 45.5 µm; h = 14 µm; body diameter at lip region = 14.5 µm; body diameter at guiding ring = 34 µm; body diameter at base of oesophagus = 38 µm; body diameter at mid-body = 42 µm; body diameter at anus = 30 µm; body diameter at beginning of h = 9.5 µm; spicules = 50.5 µm; gubernaculum = 12.5 µm; cloaca to double papilla = 9 µm; double papilla to atrophied supplement = 175.5 µm.

DESCRIPTION

Female : Habitus an open letter C in specimens killed by gentle heat; body robust, cylindrical, tapering very gradually towards the anterior extremity; cuticle with very fine transverse striations, 2-2.5 µm thick along the

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

	<i>J1</i>	<i>J2</i>	<i>J3</i>	<i>J4</i>	Females	Males
n	4	9	11	4	31	20
L (mm)	1.3-1.4 (1.3 \pm 0.03)	1.7-2.1 (1.9 \pm 0.17)	2.0-2.5 (2.3 \pm 0.12)	2.5-2.8 (2.6 \pm 0.16)	3.1-4.5 (3.6 \pm 0.45)	3.0-4.0 (3.4 \pm 0.23)
a	52.0-59.0 (54.5 \pm 3.2)	53.3-81.1 (61.7 \pm 8.61)	58.1-76.5 (69.5 \pm 5.15)	66.2-76.0 (71.6 \pm 4.34)	73.2-131.2 (88.1 \pm 16.89)	76.0-97.2 (86.3 \pm 5.68)
b	4.2-4.9 (4.4 \pm 0.32)	4.6-5.8 (5.1 \pm 0.37)	4.8-8.7 (5.8 \pm 1.02)	5.8-6.7 (6.1 \pm 0.40)	6.9-9.8 (7.9 \pm 0.83)	6.6-8.1 (7.4 \pm 0.38)
c	22.0-24.3 (23.1 \pm 0.93)	29.9-33.9 (31.5 \pm 1.24)	34.3-47.6 (42.3 \pm 3.48)	48.0-55.7 (51.1 \pm 3.59)	63.4-107.3 (79.1 \pm 10.99)	54.4-73.9 (66.6 \pm 5.36)
c'	3.1-3.6 (3.3 \pm 0.26)	2.4-4.1 (2.8 \pm 0.52)	1.9-2.4 (2.1 \pm 0.17)	1.8-2.2 (1.9 \pm 0.20)	1.2-2.3 (1.6 \pm 0.25)	1.5-1.9 (1.6 \pm 0.14)
V	— —	— —	— —	— —	41.8-53.7 (47.0 \pm 3.09)	— —
Odontostyle	67.1-69.4 (68.0 \pm 1.13)	75.9-89.4 (83.1 \pm 4.73)	83.5-108.8 (99.9 \pm 6.13)	104.1-106.5 (105.4 \pm 1.21)	107.1-134.1 (121.6 \pm 6.72)	117.1-130.6 (123.6 \pm 4.39)
Odontophore	41.2-47.7 (45.7 \pm 3.09)	50.0-55.3 (52.5 \pm 1.88)	54.1-63.5 (60.3 \pm 2.53)	61.2-64.1 (62.3 \pm 1.44)	61.8-75.9 (69.5 \pm 3.36)	65.8-72.3 (69.2 \pm 1.87)
Total spear length	108.2-117.1 (113.7 \pm 3.91)	126.5-143.0 (135.7 \pm 5.50)	137.7-172.3 (160.3 \pm 8.40)	165.9-169.4 (167.8 \pm 1.47)	169.4-203.5 (191.0 \pm 9.42)	185.3-200.6 (192.8 \pm 4.54)
Replacement odontostyle	83.5-88.8 (86.2 \pm 2.74)	91.8-105.9 (101.7 \pm 4.88)	102.9-131.2 (119.8 \pm 6.71)	120.6-128.2 (125.2 \pm 3.27)	— —	— —
Oral aperture to guiding ring	60.0-61.2 (60.6 \pm 0.48)	71.8-81.2 (77.5 \pm 2.91)	72.9-100.6 (91.1 \pm 6.96)	96.5-100.0 (98.4 \pm 1.88)	100.0-125.9 (113.8 \pm 6.93)	106.5-122.3 (113.8 \pm 4.60)
Tail length	54.7-58.8 (57.5 \pm 1.88)	51.8-66.5 (59.1 \pm 4.81)	47.6-58.8 (54.9 \pm 3.79)	47.7-57.1 (51.8 \pm 3.93)	36.5-56.5 (46.1 \pm 4.72)	45.8-61.2 (51.8 \pm 4.50)
h (hyalin portion of the tail)	10.6-15.9 (13.2 \pm 2.47)	12.9-18.8 (15.9 \pm 2.24)	14.7-22.9 (18.6 \pm 2.80)	14.1-21.8 (17.2 \pm 3.24)	11.2-20.6 (16.3 \pm 2.52)	14.7-23.5 (19.9 \pm 2.58)
Body diam. at lip region	8.8-10.0 (9.6 \pm 0.56)	10.6-11.8 (11.4 \pm 0.51)	10.6-12.9 (12.2 \pm 0.75)	12.3-12.9 (12.8 \pm 0.29)	11.8-15.3 (14.1 \pm 1.16)	13.5-15.3 (14.4 \pm 0.45)
Body diam. at guiding ring	20.0-21.2 (20.6 \pm 0.48)	22.4-27.7 (25.4 \pm 1.40)	26.5-30.6 (29.0 \pm 1.34)	29.4-30.6 (30.2 \pm 0.56)	27.1-38.2 (33.7 \pm 3.03)	31.7-37.1 (34.3 \pm 1.13)
Body diam. at base of oesophagus	21.2-25.3 (23.5 \pm 1.73)	25.3-31.8 (29.1 \pm 2.10)	30.0-35.3 (32.3 \pm 1.52)	34.7-36.5 (35.6 \pm 0.76)	31.2-42.4 (38.3 \pm 2.79)	33.5-41.2 (38.2 \pm 1.85)
Body diam. at mid-body or vulva	22.9-25.8 (24.4 \pm 1.40)	25.9-34.7 (30.4 \pm 2.82)	30.6-37.1 (33.4 \pm 2.02)	35.9-37.7 (36.9 \pm 0.74)	34.7-49.4 (41.6 \pm 3.47)	35.3-45.3 (39.9 \pm 2.67)
Body diam. at anus	16.5-18.8 (17.4 \pm 1.13)	15.9-25.9 (21.9 \pm 2.83)	24.1-27.6 (25.7 \pm 1.21)	25.9-28.8 (27.1 \pm 1.27)	22.9-35.3 (29.1 \pm 2.82)	28.8-32.9 (31.1 \pm 1.06)
Body diam. at beginning of h	6.5-7.7 (6.9 \pm 0.56)	7.1-10.6 (8.6 \pm 1.25)	8.2-13.5 (10.4 \pm 1.32)	8.2-12.9 (10.6 \pm 1.92)	9.4-14.1 (12.6 \pm 1.20)	10.6-14.1 (12.4 \pm 1.24)
Spicules	— —	— —	— —	— —	— —	49.4-58.2 (54.3 \pm 2.51)
Lateral guiding piece	— —	— —	— —	— —	— —	10.6-15.8 (13.2 \pm 1.29)

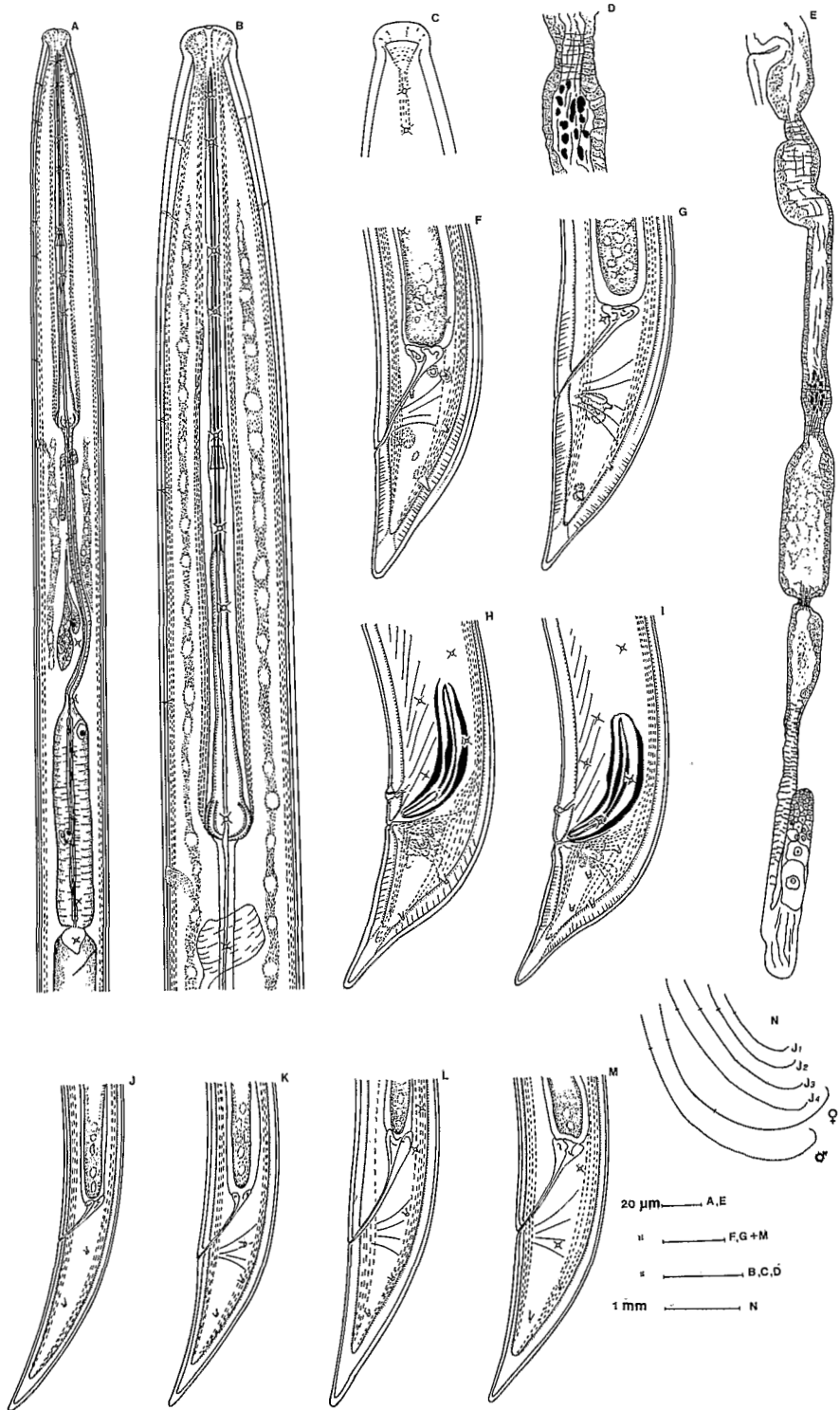


Fig. 1. *Xiphinema abrantinum* sp. n. A, B : Female, anterior region; C : Head end (surface view); D : Pseudo-Z-organ; E : Posterior branch of the genital tract; F, G : Female posterior region; H, I : Male posterior region; J-M : Posterior region of juveniles, J1-J4 respectively; N : Posture of juvenile and adult stages.

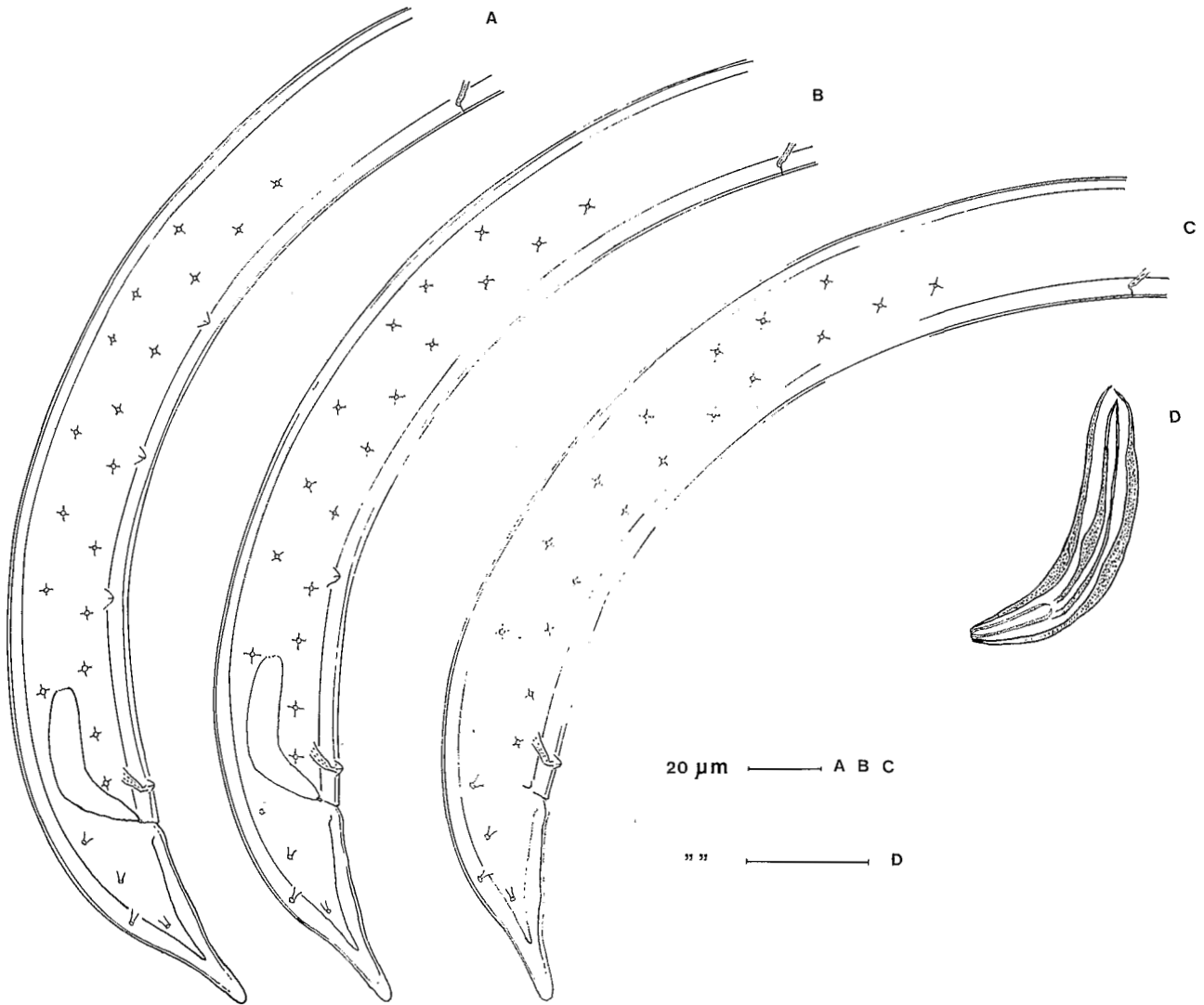


Fig. 2. *Xiphinema abrantinum* sp. n. Male. A-C : Posterior part of the body showing position of ventral atrophied supplement and of ventromedian papillae; D : Spicules.

body, more thickened in the neck region, where it measures 3.5-4 μm at the base of lip region, and in the caudal region where it is 4.5-5 μm ventrally and dorsally in the post anal portion; lateral hypodermal cords readily visible throughout the length of the body, 7-8 μm wide at mid-body or 18-20 % of the corresponding body diameter; lateral body pores, 5-6 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 intestine; two dorsal and four ventral body pores in the range of the odontostyle, well evident in the neck region and in the rest of the body. Labial region 7-8 μm high, hemispherical, widely rounded laterally and less so frontally, offset from the rest of the body by a wide depression; amphids large, stirrup-shaped, with aperture a wide, straight, transverse slit; odontostyle

Table 2

Xiphinema abrantinum sp. n. Position of the ventral rudimentary supplement and ventro-median papillae in 20 paratype males (in μm).

N ^o	Cloaca-double pap.	Double pap. SI
1	11	215
2	9	207
3	8.5	197
4	8.5	210
5	9.5	202
6	9.5	235
7	8	223
8	10	182
9	11	213
10	11	227
11	10	129
12	10	117
13	11	191
14	9	no atrophied supplement
15	11	191, 1 ventro-median papilla
16	10	129, 1 ventro-median papilla
17	8	210, 3 ventro-median papillae
18	9	189, 3 ventro-median papillae
19	10	217, 3 ventro-median papillae
20	11	198, 3 ventro-median papillae

1.5-2 μm in diameter; basal flanges 12.5-13 μm wide and guiding "tube" well evident, variable in length from 6 to 18 μm , with robust guiding ring, 4.5-5 μm wide; oesophagus dorylaimoid with the anterior part tubular; basal enlarged portion 110-120 μm long and 18-20 μm wide, containing three nuclei well evident: the dorsal located at the beginning of the basal bulb, the two subventral almost at the middle of the glandular oesophagus; oesophageal-intestinal valve heart-shaped. Reproductive system amphidelphic, with equally developed branches; vulva slit-like, situated slightly anterior to mid body; vagina extending about 2/3 of the corresponding body diameter; uterus 280-300 μm in length, consisting of a proximal tubular portion and a distal part in which a pseudo-Z-differentiation occurs; no spines or other structures visible along the whole length of the uterus; pseudo-Z-organ consisting of a variable number of rounded or oval globules (12-15), with smooth surface, arranged more or less parallel to the axis of the uterus; tubular part of uterus followed distally by a large spermatheca delimited from the oviduct by a robust sphincter; oviduct consisting of a large pouch and a tubular portion; ovaries reflexed. Prerectum 530 μm (350-800) long; rectum extending slightly more than the body width at the anus. Tail conoid with rounded terminus, mainly curved dorsally with ventral profile,

almost straight, in line with body contour, without peg, but with a blind terminal canal; two or three caudal pores are evident on each side of the tail.

Male: General appearance similar to female with posterior part of the body more curved. Morphology and anatomy similar to female except in the genital apparatus and the somatic structures associated with it; testis well developed; spicules curved, not cephalated; lateral guiding pieces rounded posteriorly and bifid at the anterior end. Precloacal pair of papillae very evident preceded by one rudimentary ventral supplement; on six of twenty specimens examined, one or three ventro-median papillae (Luc & Cohn, 1982), are visible between double papilla and atrophied supplement; only one male without atrophied supplement (distribution and position of double papilla and of rudimentary supplement is given for each of the males in Table 2.) Tail similar to that of female but more curved dorsally, with the rounded extremity ventrally located in relation to the body axis; three or four caudal pores on each side of the tail.

Juveniles: Morphologically similar to adult females but smaller; tail of first stage conoid-elongated.

TYPE HOST AND LOCALITY

Rhizosphere of *Prunus persica* Stokes, at Casal Coelheira, Tramagal, Abrantes, Province of Ribatejo, Portugal.

TYPE SPECIMENS

Holotype, allotype, 25 paratype females, 14 paratype males and juveniles in the collection of the Istituto di Nematologia Agraria del Consiglio Nazionale delle Ricerche, Bari, Italy; two paratype females and two paratype males in each of the following collections: Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France; Nematology Department, Rothamsted Experimental Station, Harpenden, Herts, England; Plant Nematology Laboratory Collection, United States Department of Agriculture, Beltsville, Maryland, USA.

DIAGNOSIS AND RELATIONSHIPS

Xiphinema abrantinum sp. n. is characterized by two female genital branches equally developed, almost equatorial vulva, pseudo-Z-organ and tail conoid, curved dorsally and almost straight ventrally with rounded terminus. The male is characterized by one rudimentary ventro-median supplement. By this unusual character *X. abrantinum* sp. n. can be distinguished from the closely resembling species.

The new species belongs to the *X. coxi*-group. On the other aspects *X. abrantinum* sp. n. is similar to *X. dissimile* Roca, Pereira & Lamberti, 1988, also found in Portugal, *X. israeliae* Luc, Brown & Cohn, 1982, *X. meridianum* Heyns, 1971, *X. sahelense* Dalmasso, 1969 and *X. coxi europaeum* Sturhan, 1985. It resembles *X. dissimile* most, from which it differs in having shorter body length (L of *X. dissimile* : female 4.6-5.8 mm, male 4.2-5.7 mm), lower "c" value of female (63-107 vs 97-135), lower number of dorsal cervical pores (2 vs 7 in *X. dissimile*) and differently shaped inclusions in the pseudo-Z-organ (rosette-shaped in *X. dissimile*); from *X. israeliae* in having a differently shaped tail (clearly digitate in *X. israeliae*) and in the presence of a pseudo-Z-organ (absent in *X. israeliae*); from *X. meridianum* in having longer odontostyle (107-134 vs 95-102 μ m), wider lip region, presence of males and different structure of pseudo-Z-organ; from *X. sahelense* in having a shorter body length and odontostyle (L = 4.00 mm, odontostyle = 130 μ m in *X. sahelense*) and pseudo-Z-organ (absent in *X. sahelense*); and from *X.*

coxi europaeum in having slightly a shorter body (generally more than 4.00 mm in *X. coxi europaeum*), differently shaped lip region (almost continuous with the rest of the body in *X. coxi europaeum*), pseudo-Z-organ and tail of the male (more rounded in *X. coxi europaeum*).

The code in the polytomous key (Loof & Luc, 1990) is the following : A4, B2, C34, D45, E456, F345, G2, H2, I3, J3, K2, L2.

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