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South Africa

## THE GENUS *XIPHINEMA* IN SOUTH AFRICA XXV. *XIPHINEMA AABA* SP.N. (NEMATODA: LONGIDORIDAE)

by  
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**Summary.** *Xiphinema aaba* sp.n. is described from northern KwaZulu-Natal, South Africa. The new species is characterised by a strongly ventrally curved body posture, didelphic sexual system, vulva near middle of body, absence of spines in uterus, pseudo-z-organ with mostly only four large oblong inclusions, conoid often subdigitate tail and presence of males with two to five well-developed ventromedian supplements. It belongs in Loof and Luc's (1990) group 5, and is compared with *X. pongolense* Hutsebaut, *X. abrantinum* Roca et Pereira, and *X. dissimile* Roca, Pereira et Lamberti.

Specimens were extracted from soil by decantation and centrifugation, killed by gradual heat, fixed in FAA and processed into dehydrated glycerine by Cobb's slow method. Measurements and drawings were done with the aid of a drawing tube, and measurements of curved structures such as spicules and tail were made along the curved median line.

### *XIPHINEMA AABA* sp.n.

(Table 1; Figs 1 and 2)

*General description* (10♀♀, 10♂♂). Body of heat-relaxed specimens of both sexes strongly ventrally curved, describing at least one full circle. Cuticle with minute transverse striae, and indistinct radial striae in the tail region. Lateral hypodermal cords 13.3 (12-14) µm wide (23-25.5% of the corresponding body diameter) over greater part of body, narrowing towards lip region, broadening in tail region. Lateral pores typically in a single row on the front part of the neck, thereafter diverging into two rows

along the dorsal and ventral sides of the lateral cord; with seven or eight lateral, three or four dorsal and four or five ventral pores in the range of the odontostyle. Lip region flatly rounded, about 12 µm wide and 6-7 µm high, offset by a shallow depression. Amphids stirrup-shaped, with a 5.5-6.5 µm wide transverse slit, located on the lip region near the shallow depression. Hemizonid 186 (179-200) µm from the anterior end, situated between the base of the stylet and the nerve ring. Odontostyle about 1.5 µm in diameter. Basal flanges 13-15 µm wide. Pharynx (= oesophagus) typical for the genus, with gland nuclei easily visible. Positions of gland nuclei and outlets situated as follows: Female (n=10): DO=8.3 (6.9-9.9); DN=11.0 (9.8-12.5); SN=54.2 (49.4-58.9); SO=79.7 (76.0-83.2). Male (n=8): DO=9.6 (7.9-12.0); DN=11.9 (10.9-13.5); SN=56.7 (52.7-58.7); SO=83.7 (80.4-86.9). Pharyngo-intestinal valve consisting of several large, loosely associated cells.

*Female.* Reproductive system didelphic, with both branches equally developed. Vulva a transverse slit. Vagina 18-20 µm long, comprising 39

TABLE I - *Morphometrics of Xiphinema aaba sp.n. (L in mm, other measurements in µm).*

	Holotype	♀ Paratypes	♂ Paratypes	J3	J4
n		10	10	3	10
L (mm)	33.3	3.32 (3.05-3.61)	3.18 (2.93-3.71)	1.84 (1.71-1.99)	2.40 (2.19-2.59)
a	69.1	63.5 (56.2-70.9)	69.8 (61.0-78.9)	53.6 (49.6-57.7)	58.6 (49.8-66.4)
b	7.7	7.8 (7.4-8.2)	7.6 (7.0-8.7)	6.0 (5.1-7.4)	6.1 (5.3-6.6)
c	47.6	51.1 (43.8-54.7)	47.8 (42.3-55.2)	23.7 (21.6-24.9)	32.4 (27.7-35.9)
c'	2.32	2.21 (1.91-2.46)	2.10 (1.83-2.50)	3.31 (3.02-3.59)	2.75 (2.57-2.93)
V	50.2	50.6 (48.4-52.5)			
Odontostyle	105	103 (98-106)	103 (98-106)	66 (64-68)	87 (79-93)
Odontophore	72	73 (67-78)	70 (65-79)	55 (54-55)	62 (60-64)
Stylet	177	176 (169-181)	172 (163-183)	120 (119-122)	149 (139-156)
Replacement odontostyle				87 (84-93)	107 (102-113)
Guide ring to front end	97	94 (90-99)	92 (85-100)	57 (49-64)	76 (72-79)
Basal bulb: l	100	91 (80-101)	94 (90-102)	76 (69-80)	85 (81-90)
: w	21	22.3 (20-25)	20.7 (19-22)	18.0 (17-20)	18.7 (17-21)
Body diameter: lip	12	12.2 (12-13)	11.9 (11.5-12.5)	9.2 (9-9.5)	10.5 (10-12)
: midbody	47	50.3 (46-56)	45.8 (38-52)	34.3 (34-34.5)	41.0 (38-43.5)
: anus	28.5	29.5 (27-34)	33.0 (30-34)	23.5 (22-24.5)	26.8 (25-30)
Cuticle width: behind lip	3	2.9 (2.5-3.5)	2.8 (2.5-3.2)	2.3 (2.2-2.5)	2.4 (2.3-2.5)
: midbody	3.5	3.3 (3.2-3.5)	3.2 (3-3.5)	1.5	2.4 (2-2.5)
: tail dorsal	7.5	7.9 (7.5-8.5)	7.1 (6-8)	3.7 (3.5-4.3)	5.9 (5-7)
Tail length	70	65 (57-72)	67 (60-71)	78 (74-80)	72 (68-79)
Hyaline part	31	29.4 (24-34)	27.5 (23-31)	19.0 (17-22)	24.0 (18-27)
h%	44.3	44.6 (38.7-49.1)	41.3 (35.4-46.3)	24.4 (21.5-27.5)	32.3 (27.0-35.1)

(34.6-40)% of the corresponding body width. Ovejector well-defined, kidney-shaped, 75.8 (70-83) µm long. Uterus relatively long, often somewhat convoluted, without spines or crystals. The section between the ovejector and the pseudo-z-organ is 254 (207-295) µm long, and the shorter section between the pseudo-z-organ and the *pars dilatata uteri* 44 (38-50) µm. Pseudo-z-organ basically with four rather oblong, somewhat raspberry-shaped inclusions. However, there is much variation and often the four large inclusions are irregularly shaped and accompanied by a varying number (seldom more than three or four) smaller inclusions. Wall of pseudo-z-organ not markedly thickened or strengthened. *Pars dilatata uteri* 83.6 (65-108)

µm in length, consisting of a smaller section functioning as a spermatheca, and a larger granular section, separated from the much smaller *pars dilatata oviductus* by a strong sphincter. Oviduct typical, 82.4 (63-108) µm long. Ovary 62 (50-73) µm long. No uterine eggs observed. Sperm cells present in uterus and/or spermatheca of several specimens, ovoid in shape when in uterus, more elongate when closely packed in spermatheca. Prerectum 504 (460-590) µm in length, or 17.3 (15.5-20.3) times the anal body width. Rectum 27.2 (24-32) µm long, mostly slightly shorter than anal body diameter, ranging from 80-107% of the anal body diameter. Tail conoid, dorsally convex, ventrally concave, terminus broadly rounded; tending towards a sub-

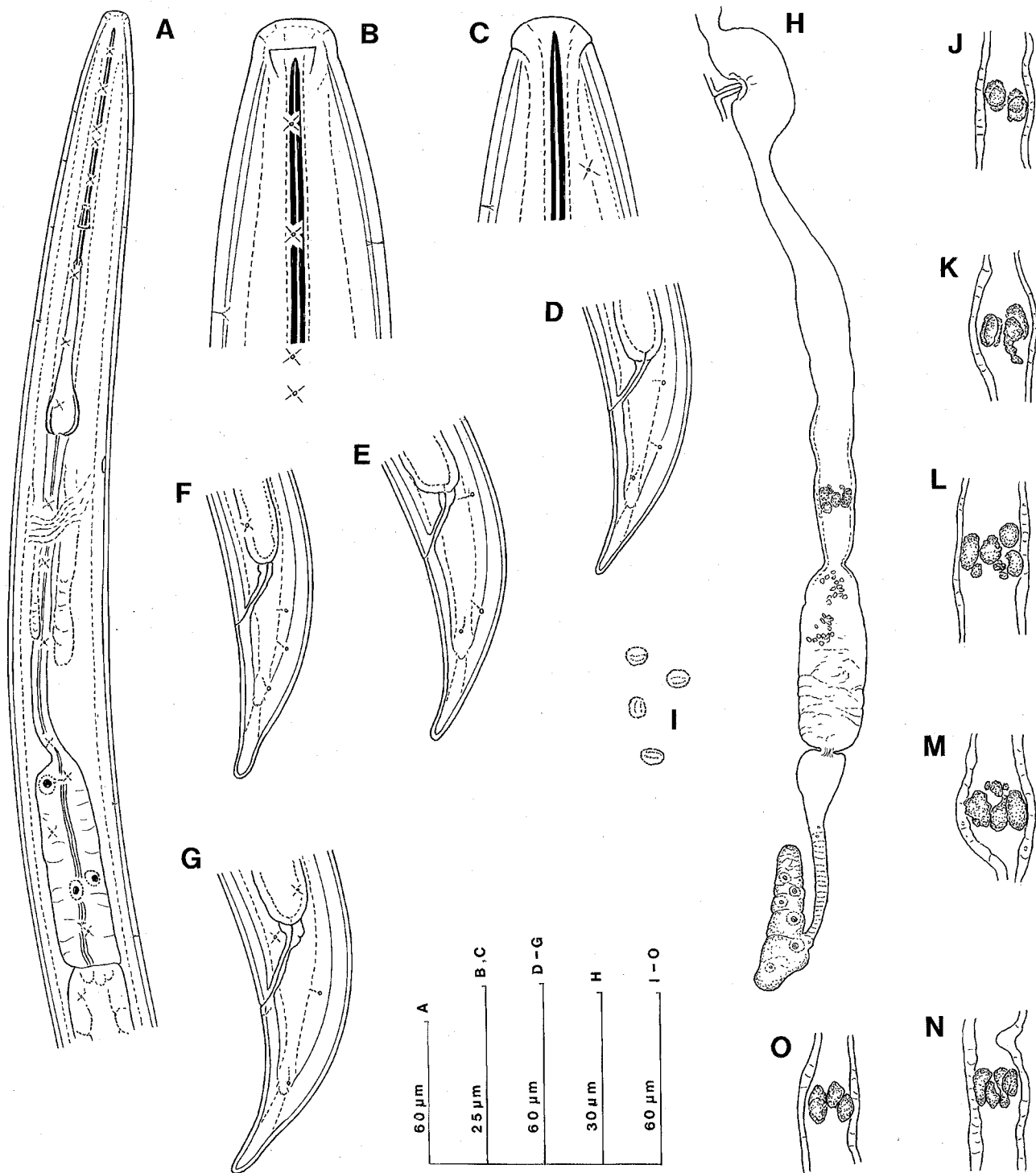


Fig. 1 - *Xiphinema aaba* sp.n.: A, anterior body region; B and C, anterior end in lateral and dorso-ventral view respectively; D-G, variation in female tail shape; H, posterior branch of female reproductive system; I, sperm cells in uterus; J-O, variation in pseudo-z-organ.

digitate condition, with the terminal 13-20  $\mu\text{m}$  narrowed and cylindroid in many specimens. Mostly two pairs of caudal papillae, with a third pair mostly just anterior to the level of the anus. In a few specimens a somewhat enlarged mid-ventral pore occurs just posterior to the anus. An ill-defined blind canal is present in the hyaline tail tip.

*Male.* Sexual organs typical for *Xiphinema*, the spicules measuring 57.6 (53-62)  $\mu\text{m}$  along the curved median line, lateral guiding pieces 11.1 (10-23)  $\mu\text{m}$ . Precloacal pair of supplements about 15-17  $\mu\text{m}$  from the cloacal opening. Ventromedian supplements well developed, mostly three or four in number, with only one male observed with two supplements, and one with five (n=14). Shape of male tail very similar to that of female, mostly with three caudal papillae rather constant in position, as seen in Fig. 2. Just posterior to the cloacal opening there is a small ventromedian papilla resembling a rudimentary ventromedian supplement.

*Juvenile.* Only third and fourth stage juveniles collected; resembling adult female in general appearance, except for the tail which is more regularly ventrally curved and without any indication of a peg. In spite of smaller body size the average absolute tail length is greatest in the J3 and still somewhat greater in the J4 than in the adult, resulting also in a much smaller c-ratio.

### Type host and locality

Rhizosphere of indigenous grasses and fever tree (*Acacia xanthophloea* Benth.) near the town of Pongola in northern KwaZulu-Natal, South Africa, collected in November 1986 by M. Hutsebaut.

### Type specimens

Holotype female on slide 3616 in the collection of the Dept. of Zoology, Rand Afrikaans

University. Paratypes on slides 3611, 3613-3615 and 3617 in the same collection. Further paratypes in the collections of the Plant Protection Research Institute in Pretoria, and the Dept. of Zoology, University of Ghent, Belgium.

### Diagnosis and relationships

*Xiphinema aaba* sp.n. is characterised by strongly ventrally curved body of medium length; slightly offset lip region; didelphic sexual system with vulva near middle of body; pseudo-z-organ with relatively few (mostly four) large inclusions; absence of spines in uterus; dorsally convex, ventrally concave conoid tail with a tendency towards a subdigitate condition; presence of males; and males with two to five well-developed ventromedian supplements.

The code in Loof and Luc's (1990 and 1993) polytomous key is A4; B2; C3; D5; E5/6; F3(4); G2; H 1/2; I 3/4; J ?; K ?; L2, placing it in group 5, where it should be compared with *X. abrantinum* Roca *et* Pereira, 1991, *X. dissimile* Roca, Pereira *et* Lamberti, 1988, and the South African species *X. pongolense* Hutsebaut, 1989. *X. aaba* sp.n. differs from *X. pongolense* in the absence of spines in the uterus, the number of supplements in the male (2-5 vs 1-2 in *X. pongolense*), body length (L♀=3.05-3.61 mm vs 3.37-4.73 mm and L♂=2.93-3.71 mm vs 3.37-4.24 mm), length of basal bulb (80-102  $\mu\text{m}$  vs 99-140  $\mu\text{m}$ ) and the number and nature of the inclusions in the pseudo-z-organ. From *X. abrantinum* the new species differs in the narrower and less conspicuously offset lip region (11.5-13  $\mu\text{m}$  wide vs 11.8-15.3  $\mu\text{m}$ ), shorter odontostyle (98-106  $\mu\text{m}$  vs 107-134  $\mu\text{m}$ ), longer tail (57-72  $\mu\text{m}$  in ♀ vs 36.5-56.6  $\mu\text{m}$ ), and greater number of ventromedian supplements in the male (2-5 well-developed ones vs 1 or 2 rudimentary ones). From *X. dissimile* the new species differs in size and other measurements (L♀=3.05-3.61  $\mu\text{m}$  vs 4.60-5.80  $\mu\text{m}$ , L♂=2.93-3.71  $\mu\text{m}$  vs 4.13-5.66  $\mu\text{m}$ ); odontostyle=98-106  $\mu\text{m}$  vs 115-134  $\mu\text{m}$ ; V=48.4-52.5% vs

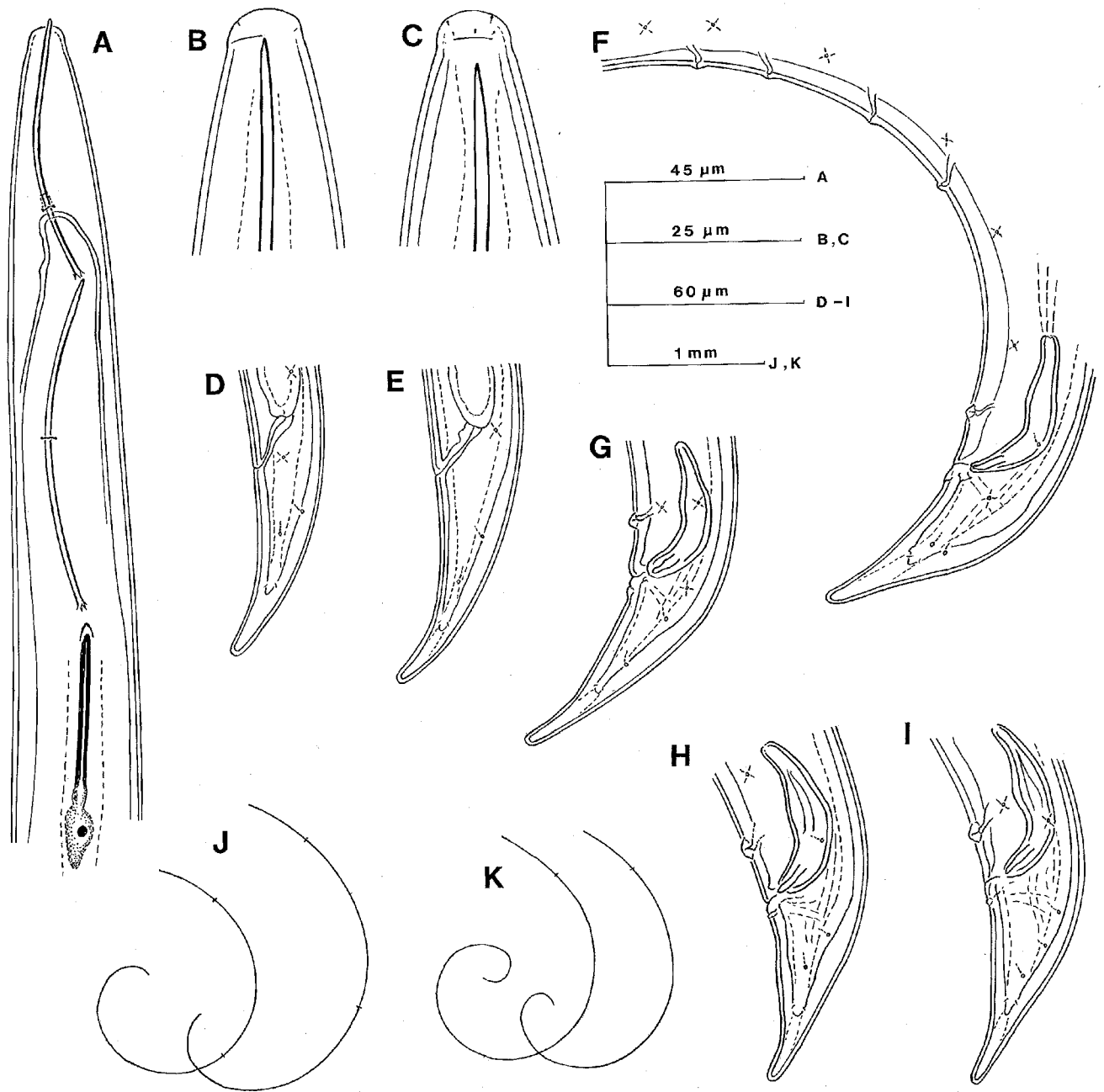


Fig. 2 - *X. aaba* sp.n.: A, anterior body region of moulting J3, showing odontostyles of J3 and J4, as well as the partly formed anterior part of the adult odontostyle with the stilet-forming gland cell; B and C, head end of J3 and J4 respectively; D and E, tails of J3 and J4 respectively; F-I, tail ends of several males showing slight variation in tail shape; J and K, body posture of female and male respectively.

43-48.6%; spicules = 53-62  $\mu\text{m}$  vs 66.5-71  $\mu\text{m}$ ), longer tail and inclusions in pseudo-z-organ also different (mostly 4 ovoid inclusions vs a larger number of rosette-like structures).

*Etymology.* *Xiphinema aaba* sp.n. is named after the mythological god of the worms.

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