

Redescription of *Xiphinema americanum* Cobb, 1913 with Comments on Its Morphometric Variations¹

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Abstract: *Xiphinema americanum* is redescribed and illustrated from material collected from Arlington Cemetery, near Cobb's type locality (Falls Church, Virginia). Morphometric data showing variations within this species are given for three additional populations.

Key words: taxonomy, dagger nematode.

Cobb (1) described *Xiphinema americanum* in 1913, indicating as its habitat "About the roots of a variety of plants—corn, grass, citrus trees—on the Atlantic and Pacific slopes of the United States." Illustrations consisted only of a head portion with stylet (presumably female) and a tail end of a male, these being published again by Cobb (3) in 1918 but preceded by a detailed full length drawing of a female published in 1914 (2). None of these publications give details on the actual source or origin of the specimens used in the original description. However, our examination of Cobb's notes (in the laboratory of second author) showed the specimens used for the original description were "from the roots of corn, at Falls Church, Va., Sept. 1908." Also, the measurements in the formula as originally published were "obtained as average of five females . . ." In his thesis research, Lima (5) had examined Cobb's notes and also concluded that Falls Church specimens were the basis for the original description.

Because Cobb's original type material of *X. americanum* was lost, Tarjan (7,8) redescribed this species and designated as the neotype a male of a population from Rhode Island, stating that these specimens are consistent with Cobb's original description. In the same publication, Rhode Island was designated as the new type locality and bent grass (*Agrostis* sp.) as the host, and on such topotypes, the species was redescribed by Siddiqi (6) and Lamberti and Blev-Zacheo (4).

Original specimens collected by Cobb at Arlington Farm were recently found at the Nematology Laboratory, U.S. Department of Agriculture, Beltsville, Maryland. Arlington Farm, now included in Arlington Cemetery, is only a few miles from Falls Church; therefore we consider it to be appropriate and worthwhile to use this and other material as a basis for redescription of *X. americanum*.

Cobb's original specimens, however, were poorly preserved and, although clearly showing some morphometric characters, these alone were not sufficient for the redescription. Therefore, fresh material was collected by the second author on 18 December 1981 in the Arlington Cemetery and two collections were made at Beltsville (grass and peach rhizosphere).

Specimens were killed by hot 5% formalin and mounted in glycerin.

Xiphinema americanum Cobb, 1913 (Table 1, Fig. 1)

Females: Body a more or less open "c" to single spiral when killed; body tapering gradually toward the extremities. Cuticle very finely striated transversally with shallow longitudinal striae in the subventral and subdorsal regions; generally 1–1.5 μm thick along body, except in the vulvar and caudal regions where it is 2.5–3 μm thick. Labial region rounded, semielliptical, 5 μm high, separated from rest of body by a shallow depression. Amphidial pouches stirrup shaped with slit like aperture. Odontostyle, odontophore, and guiding sheath typical of the genus; the two rings are 3 μm apart. Esophagus dorylaimoid with posterior enlarged part occupying $\frac{1}{3}$ of its total length; the muscular esophageal bulb measures 70–80 μm long and 14–20 μm wide. Esophageal-intestinal valve amorphous. Vulva a transverse slit, equatorially located; vagina

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TABLE 1. Morphometric characters of four populations of *Xiphinema americanum* (females).

Characters	Locality and host			
	Arlington Cemetery (grass)	Arlington Farm (Cobb's specimens) (grass)	Beltsville (grass)	Beltsville (peach)
n	20	10	11	10
L (mm)	1.6 (1.4-1.7)	1.5 (1.4-1.5)	1.7 (1.5-1.8)	1.5 (1.4-1.7)
a	50 (46-57)	54 (50-57)	50 (47-52)	47 (43-49)
b	6.8 (5.3-8.2)	5.8 (5.2-6.5)	7.0 (6.2-7.9)	6.9 (5.9-7.6)
c	45 (39-52)	49 (45-54)	48 (45-54)	46 (40-53)
c'	1.9 (1.7-2.2)	1.8 (1.7-2)	1.8 (1.7-1.9)	1.8 (1.6-2)
V	50 (49-53)	50 (49-52)	51 (49-53)	49 (46-51)
Odontostyle (μm)	80 (74-83)	69 (65-73)	73 (70-78)	77 (74-83)
Odontophore (μm)	45 (42-47)	44 (41-46)	47 (44-50)	47 (45-52)
Oral aperture to guiding ring (μm)	65 (60-71)	53 (51-55)	63 (61-69)	62 (56-66)
Tail (μm)	35 (33-38)	31 (28-35)	36 (32-39)	34 (30-36)
J (μm)	7 (6-8)	5 (4-6)	9 (8-10)	9 (8-10)
Body diam at lip region (μm)	10 (9-10)	8 (7-8)	10 (10-10)	10 (10-10)
Body diam at guiding ring (μm)	23 (19-26)	19 (18-21)	24 (22-25)	24 (22-26)
Body diam at base of esophagus (μm)	28 (26-32)	26 (24-27)	30 (28-33)	29 (28-33)
Body diam at vulva (μm)	32 (29-36)	28 (26-30)	35 (32-39)	33 (30-36)
Body diam at anus (μm)	19 (17-21)	17 (15-19)	20 (19-21)	19 (17-20)
Body diam at beginning of J (μm)	7 (6-8)	5 (4-6)	8.5 (8-9)	8 (7-9)

occupying 1/3 of the corresponding body diameter. Gonads amphidelphic, reflexed. Prerectum 120-140 μm long; rectum equal to body diameter at anus. Tail conoid, well

curved dorsally with subacute terminus, bearing 2-3 pairs of caudal pores.

A male was found in the rhizosphere of a peach tree at Beltsville. Its morphomet-

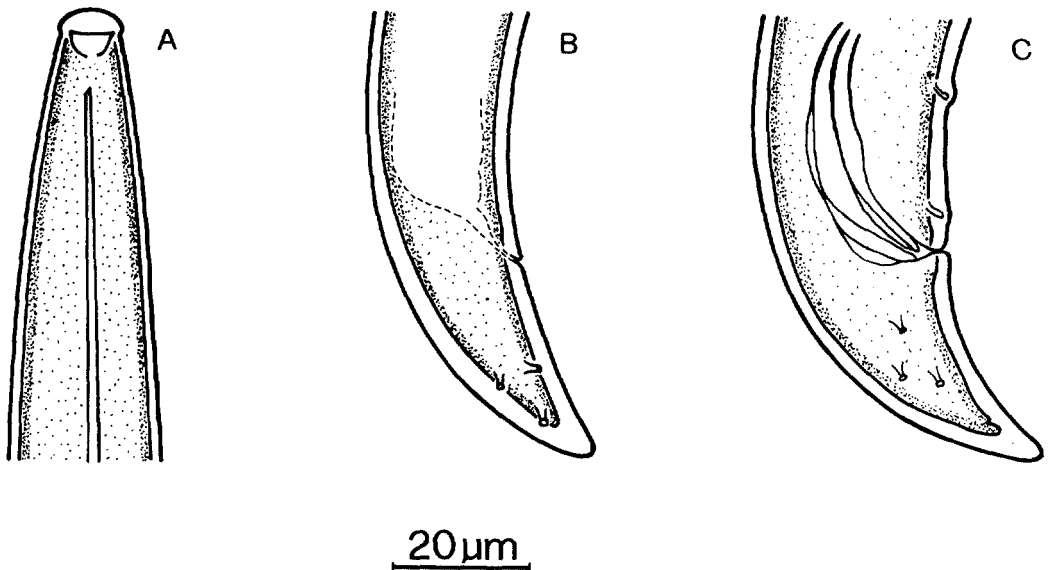


FIG. 1. *Xiphinema americanum*: anterior (A) and posterior (B) regions of female; posterior region of male (C).

rics are $L = 1.6$ mm; $a = 46$; $b = 8.9$; $c = 40$; $c' = 1.7$; odontostyle = $74 \mu\text{m}$; odontophore = $49 \mu\text{m}$; oral aperture to guiding ring = $70 \mu\text{m}$; spicules = $33 \mu\text{m}$; tail = $40 \mu\text{m}$; $J = 8 \mu\text{m}$.

The male is similar to the females but more coiled in the posterior region. Testes well developed and contain large sperms. The adanal pair of supplements is preceded by a row of seven ventromedian supplements.

Representative specimens are deposited as follows: Nematology Laboratory, U.S. Department of Agriculture Nematode Collection, Beltsville, Maryland, USA; Collection of the Istituto di Nematologia Agraria del Consiglio Nazionale delle Ricerche, Bari, Italy; Nematology Department, Rothamsted Experimental Station, Harpenden, Herts, England.

At first sight, the Arlington Cemetery population seems somewhat different, especially in total stylet length, from the Rhode Island specimens designated as topotypes by Tarjan (7) and Lamberti and Bleve-Zacheo (4). However, Cobb's specimens from Arlington Farm are intermediate between these two Rhode Island populations; even though badly preserved, they can be determined to be closer to the Rhode Island specimens than to those from Arlington Cemetery. Moreover, although the average measurements of the two Beltsville populations differ slightly from the Rhode Island material, in both populations some characters are closer to the Arlington Farm specimens and others are closer to the Arlington Cemetery specimens. Thus, there are various measurements equal, or essentially so, in all of the four populations studied here and in the former topotypes from

Rhode Island. In each of these four populations including Rhode Island, there are specimens that might be attributed for their morphometric characters to any of the populations studied.

We conclude, therefore, that the four populations described here, the population from Rhode Island, and the other populations reported as *X. americanum* by Lamberti and Bleve-Zacheo (4) are all *X. americanum*. The slight differences observed in their morphometrics are probably normal biological variations which might be caused by pedoclimatic and nutritional factors.

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