

Short note

The absence of a tail mucro in *Xiphinema index* (Nematoda: Longidoridae) appears not to be an inherited characteristic

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Several *Xiphinema* species are characterised by the presence of a terminal digitate mucro (= peg) on the tail (Loof & Luc, 1990) but female *X. index* have been reported without tail mucro (Heyns, 1971). During a survey of *X. index* in vineyards in Crete, Greece, a few female specimens without tail mucro were found in a population from Heraklion Province. Nematodes were recovered from a 500 g soil sample by a decanting and sieving method (Brown & Boag, 1988), heat-killed, fixed in hot F.A.A. and processed and mounted on microscope slides in anhydrous glycerine (Hooper, 1992). Five out of 17 (29%) female *X. index* recovered from the sample did not have tail mucro and the morphometric and allometric characters of the specimens with and without tail mucro are presented in Table 1 and Fig. 1. The only obvious differences between the two groups of specimens is in the values of tail length, length of hyaline portion and ratios c and c' .

Nematodes were extracted from a further sample and examined with a stereoscopic microscope. A further three non-gravid females without tail mucro and ten females with tail mucro were identified. The three females without tail mucro were placed in a 5 litre pot containing a young fig plant growing in a steam-sterilized sand and soil (3:1). The ten females with tail mucro were placed in a second pot. The pots were maintained in a controlled environment room at 23–26° C with a 16 hour photoperiod.

After ten months all nematodes were extracted from the pots and observed under a stereoscopic microscope. From the pot, to which the three females without tail mucro had been added, a total of 108 *X. index* were recovered (70 females and 38 juveniles) and from the other pot, 202 nematodes were recovered (74 females and 128 juveniles). Although some variation was present in the tail shape

of the females recovered from the two pots the females in each pot all had tail mucro.

The tail shapes of the juvenile developmental stages recovered from the original soil sample, and from the two pots, were similar to those reported for *X. index* by Vovlas & Larizza (1994), with the 3rd and 4th stages having a distinct tail mucro (data not presented).

The site in Heraklion Province was resampled one year after the original sample had been collected and approximately 100 specimens, females and juveniles, were examined. Of these, two females and one 4th stage juvenile had tails without a mucro. A second resampling at the original site and from adjacent rows of grapevines was done after a further six weeks and of the female *X. index* recovered 2 of 100, 1 of 50 and none of 30 did not have tail mucro.

Variation in tail shape of *X. index* has been presented in illustrations by Heyns (1971), Siddiqi (1974) and Loof & Luc (1990), and these authors and Harris (1979) refer to the occurrence of *X. index* females without tail mucro. Loof & Luc (1990), in a polytomic key for the identification of *Xiphinema* spp., distinguished between *X. index* females with and without tail mucro by providing separate codes in their key for tail shape (C-67b for those females with a tail mucro, and C-5a for those without).

In the original sample approximately 30% of the female specimens were without tail mucro but during subsequent resampling only 2 to 3% on females did not have tail mucro. From observation of *X. index* with tails without mucro it would appear that a mucro may have existed, but that it has been physically eroded or removed (Figure 1). Also, as *X. index* reproduces by mitotic parthenogenesis, if the absence of a tail mucro was genetically determined a proportion of the progeny produced by females without tail

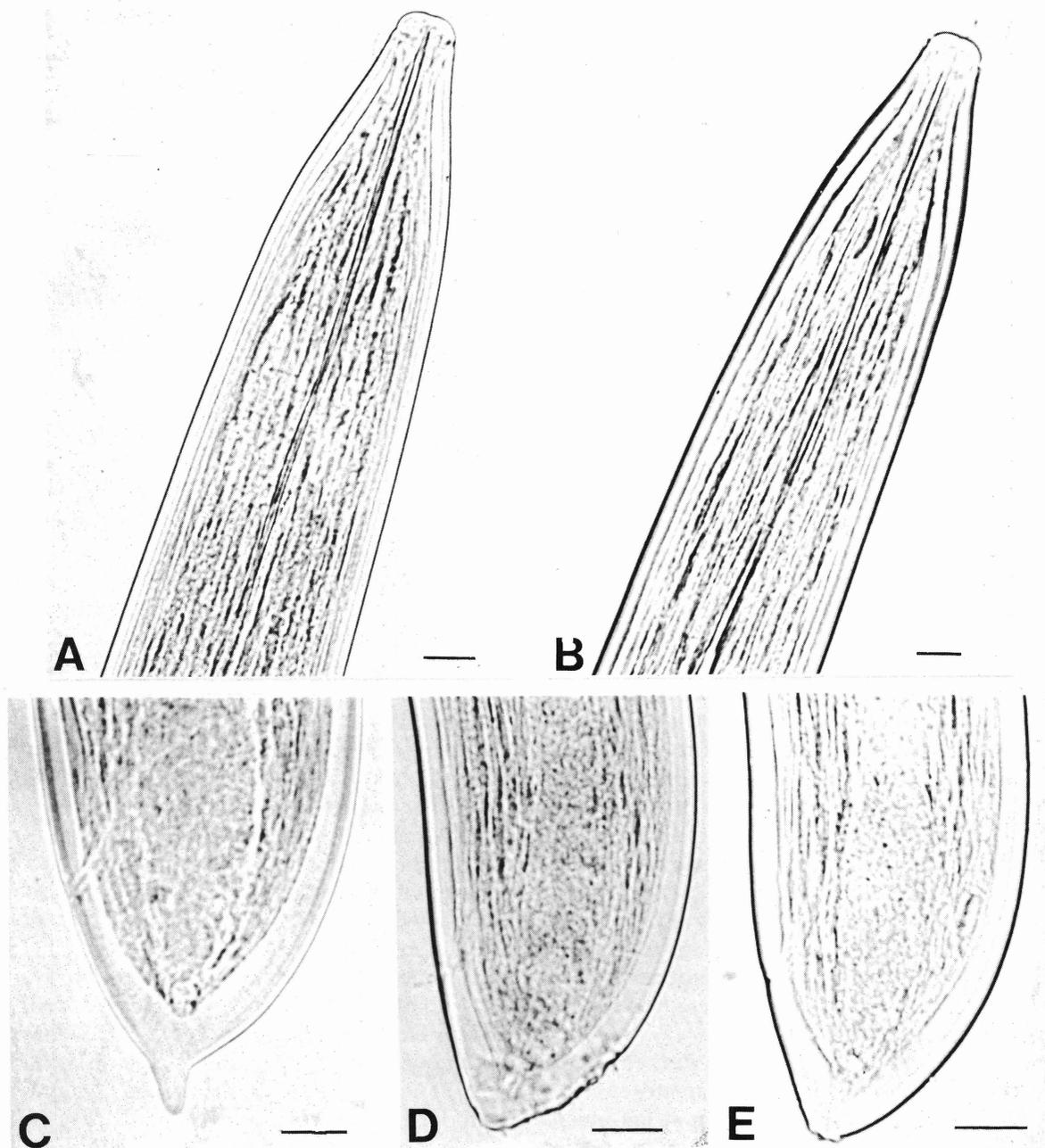


Fig. 1. Head and tail shapes of female *Xiphinema index* from Heraklion Province, Crete, Greece. A & C: Head and tail of specimen with tail mucro; B, D & E: Head and tails of specimens without tail mucro. Scale bar - 10 μ m.

mucro would be expected not to have a tail mucro. However, this did not occur in our experiment, therefore the absence of a tail mucro probably results from its removal due to physical events as the nematode moves through the soil environment, or during cultivation of the soil. It may be concluded that female and 4th stage juveniles of *X. index* without tail mucro occur naturally at low levels, but that this feature is not inherited.

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Table 1. Morphometric and allometric characters (mean \pm one standard deviation) of female *Xiphinema index* with and without tail mucro.

Characters	With mucro	Without mucro
n	12	5
L (mm)	2.83 \pm 0.2	3.09 \pm 0.36
a	54.6 \pm 4.7	60.5 \pm 8.3
b	6.97 \pm 0.73	7.03 \pm 0.59
c	74.1 \pm 3.8	97.7 \pm 13.9
c'	0.99 \pm 0.07	0.81 \pm 0.09
V	40.8 \pm 2.5	41.1 \pm 0.8
Odontostyle length (μm)	123.4 \pm 6.8	129.6 \pm 6.9
Odontophore length (μm)	71.6 \pm 4.3	74.3 \pm 1.5
Distance from anterior to guide ring (μm)	106.9 \pm 7.7	103.5 \pm 6.4
Tail length (μm)	38.4 \pm 2.8	31.8 \pm 2.5
Tail hyaline length (μm)	15.8 \pm 1.5	9.00 \pm 2.59
Body diameters:		
Lips (μm)	11.8 \pm 1.5	11.7 \pm 0.7
Guide ring (μm)	36.9 \pm 5.1	36.0 \pm 4.4
Base of esophagus (μm)	45.1 \pm 7.3	44.1 \pm 6.1
Vulva (μm)	51.8 \pm 7.6	47.5 \pm 1.7
Anus (μm)	38.5 \pm 3.6	37.1 \pm 1.4
Tail hyaline (μm)	18.9 \pm 3.0	19.2 \pm 3.3

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