

## A Taxonomical Study on The Family of Longidoridae (Nematoda) in Korea. 1. Three Unrecorded Species of Longidoridae

韓國에 있어서 Longidoridae科 線虫의 分類學的 研究

1. 한국산 Longidoridae 科의 3 미기록종에 관하여

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**ABSTRACT** Taxonomical study on the Longidoridae from Korea were undertaken at Kyungsangbuk-do. Three species belonging to two genera in Longidoridae were identified. *Xiphinema zulu*, *X. setariae* and *Longidorus sylphus* were newly reported from Korea.

**KEY WORDS** taxonomy, description, dagger nematode, needle nematode, Korea

**抄 錄** 韓國産 Longidoridae科 線虫을 採集하여 分類同定한 결과 慶尙北道에서 *Xiphinema*屬의 *X. zulu*, *X. setariae* 그리고 *Longidorus*屬의 *L. sylphus* 등 3種이 우리나라 未記錄種으로 밝혀졌으며 이들의 形態의 特徵, 採集地, 寄主植物등을 報告한다.

**檢 索 語** 分類, 形態의 特徵, 劍線虫, 針線虫, 韓國

*Xiphinema americanum* was reported by Choi(1963) from century plant (*Agave americana*) and winter daphne (*Daphne odora*) at Kyungpook National University greenhouse. *X. campiense* and *X. yapoense* were reported by Park(1963) from soybean (*Glycine max* Merr) and corn (*Zea mays* L.) at Pyongchang, *X. radicolica* from apple (*Malus pumila* var *dulcissima* Koidz), *X. bakeri* from mulberry (*Morus alba*) at Suwon and *X. pini* from broad leaf lilac (*Syringa oblata*) and maple trees (*Acer platanatum*) at Mt. Kyeryong san by Lee and Han(1976). Hitherto, 6 species in Longidoridae were reported from Korea. In this paper 3 species belonging to Longidoridae were newly reported.

### MATERIALS AND METHODS

Nematodes were extracted from soil by using the Baermann funnel method. After

extraction, the nematodes were fixed with hot (70°C) fixative (FG 4 : 1) and mounted in anhydrous glycerin by Seinhorst's rapid glycerin method. Measurements and drawings were made with a drawing tube.

### Description

*Longidorus sylphus* Thorne, 1939. (Fig. 1)

Measurements: Females (n=7)

$L=3.2-4.4$  mm;  $a=77.7-98.7$ ;  $b=10.6-12.7$ ;  $c=64-87.7$ ;  $V=44.9-49.2$ ; Odontostyle= $61-76\mu\text{m}$ ; Odontophore= $37-60\mu\text{m}$ ; Guiding ring to front end= $23-27.5\mu\text{m}$ ; Guiding ring to front end/lip width= $2.2-2.5$ .

Lip region separated from the rest of the body by a slight constriction. Amphid pouch-like, bilobed. Guiding ring situated  $23-27\mu\text{m}$  from front end, 2.2—2.5 times lip width. Odontostyle about  $61-75\mu\text{m}$  long with odontophore about  $37-60\mu\text{m}$  in length. Oesophagus dorylaimoid. The anterior part of oesophagus slender, tubular and bent before

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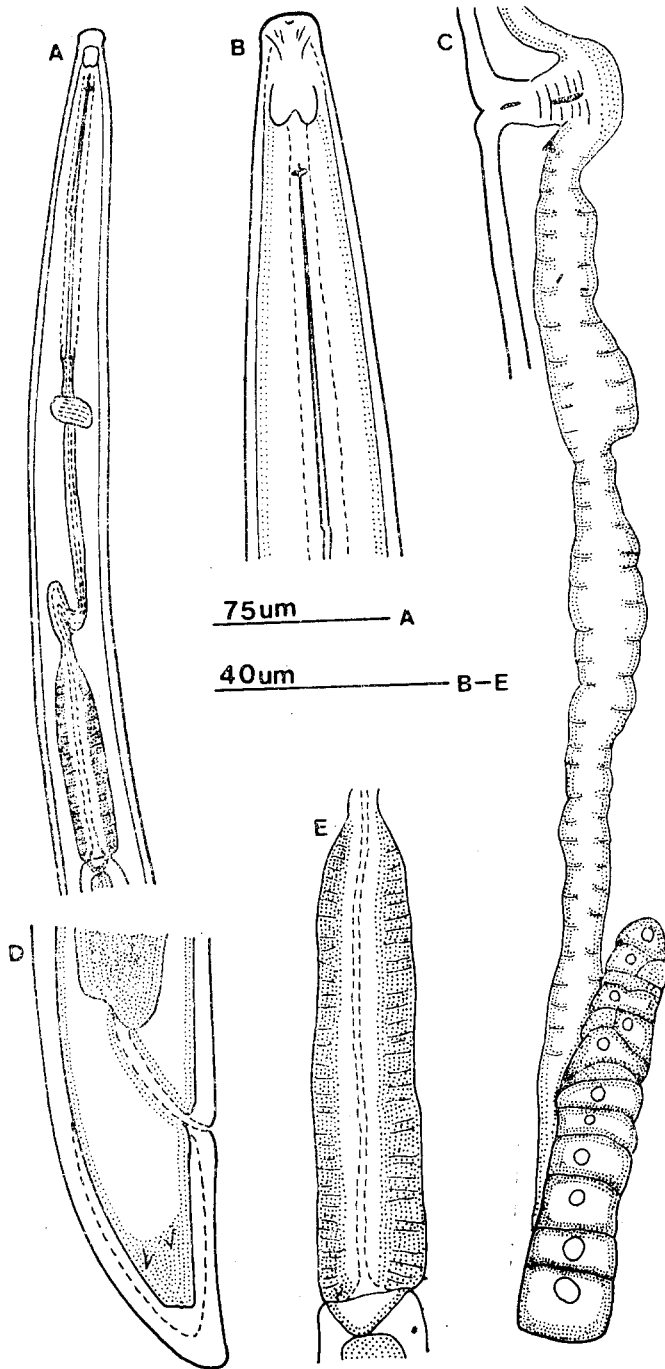


Fig. 1. *Longidorus sylphus* Thorne, 1939.

A. Anterior part of doby  
D. Tail of female

B. Head of female

C. Female reproductive system

E. Basal part of oesophagus

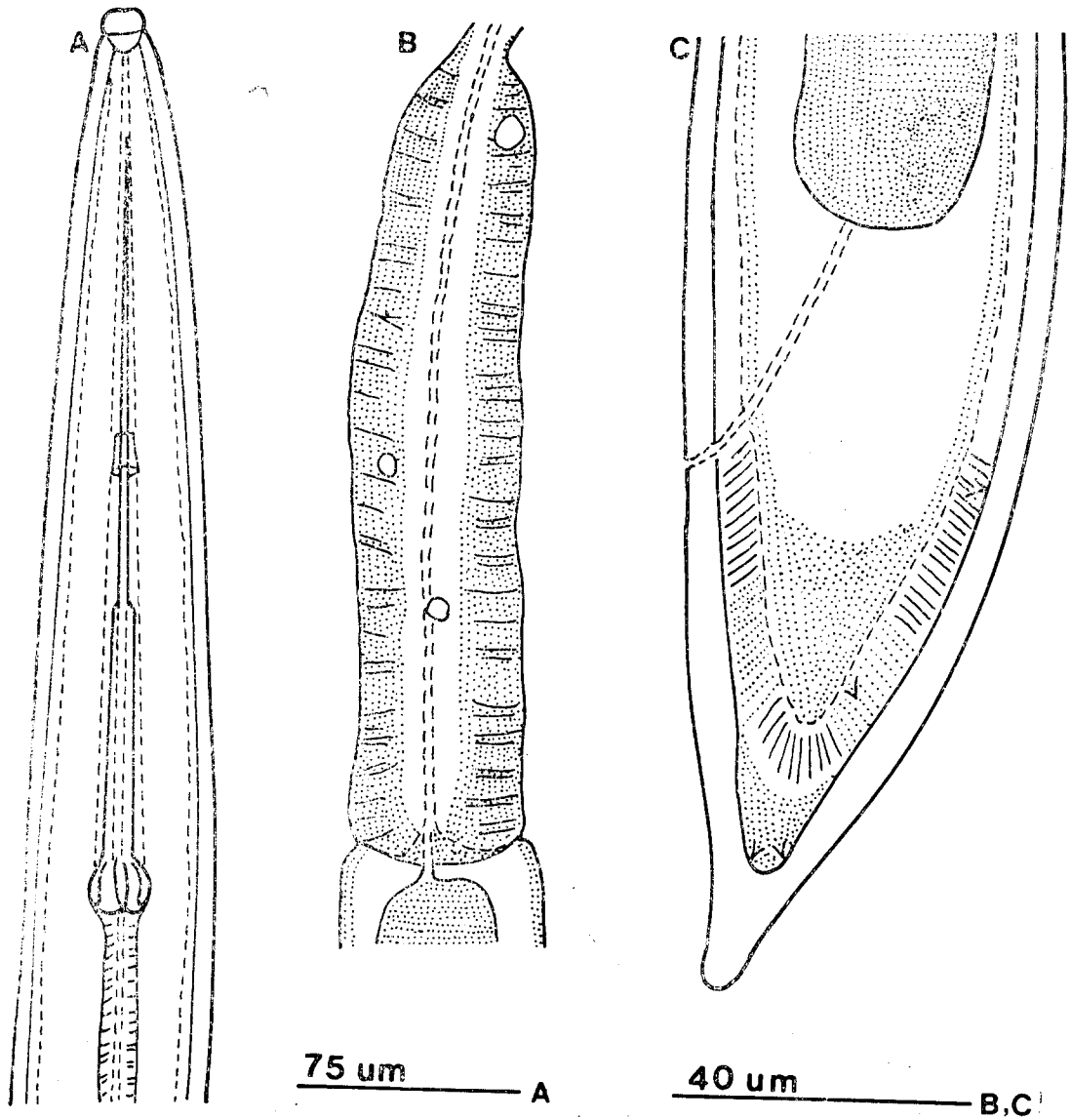


Fig. 2. *Xiphinema setariae* Luc, 1958.

A. Anterior part of body      B. Basal part of oesophagus      C. Tail of female

joining the basal oesophageal bulb. Basal oesophageal bulb 4.5 times as long as width. Cardia bluntly conoid. Vulva transverse. Female reproductive system paired. Tail convex-conoid to the blunt terminus, 41µm long, 4.5 times anal body diameter with one pair caudal papillae. The specimens corres-

pond with the description given for *L. sylphus* but odontosylet slightly short then original description.

Male: Not found.

Locality and habitat: Soil around roots of apple (*Malus pumila* var *dulcissima* Koidz) from Andong, Kyungsangbuk-do.

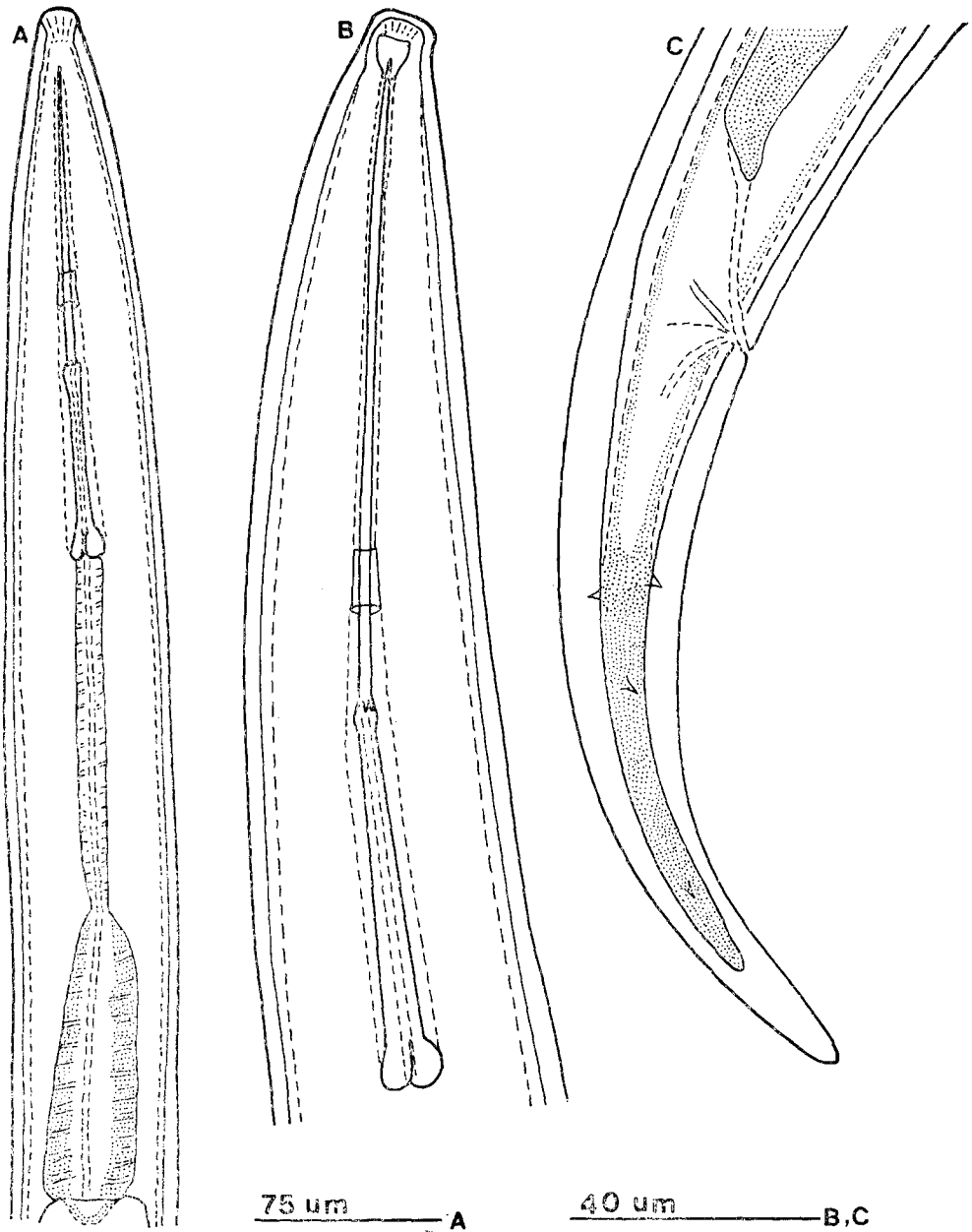


Fig. 3. *X. zulu* Heyns, 1965.

A. Anterior part of body

B. Head of female

C. Tail of female

*Xiphinema setariae* Luc, 1958. (Fig. 2)

Measurements: Females (n=2)

$L=3.2-3.3\text{mm}$ ;  $a=57.8-59.2$ ;  $b=6$ ;  $c=40.7-42.4$ ;  $V=36.3$ ;  $G_1=10.0$ ;  $G_2=11.2$ ;  $\text{Odontostyle}=130\mu\text{m}$ ;  $\text{Odontophore}=85\mu\text{m}$ ;  $G-$

uiding ring to front end= $127-135\mu\text{m}$ ; Tail length= $71\mu\text{m}$ ; Tail length/Anal body width =1.6.

Body slightly ventrally curved by heat. Lip region truncate, well set off from neck. Amphid aperture almost equal to correspon-

ding lip region. Guiding sheath situated 127—135 $\mu$ m from anterior end. Odontostyle 130 $\mu$ m long, odontophore 85 $\mu$ m long. Flange well developed. Basal oesophageal bulb 4.5—5.0 times as long as width. Tail conoid-convex, terminus bluntly pointed and slightly digitate, about 71 $\mu$ m long, 1.6 times anal body width. Female tail with four caudal papillae. The specimens correspond with the description given for *X. setariae* by Luc(1958) and Tarjan(1964) except *c* value slightly short and odontophore longer.

Male: Not found.

Locality and habitat: Soil around roots of mulberry (*Morus alba* L.) from Sangju, Kyung-sangbuk-do.

#### *Xiphinema zulu* Heyns, 1965. (Fig. 3)

Measurements: Females (n=6)

$L=2.81(2.50-3.10)$ mm;  $a=64.1(50-81.5)$ ;  $b=7.4(6.7-7.9)$ ;  $c=23.4(20.6-25.9)$ ;  $V=35.4(33.6-37.4)$ ;  $G_1=6.4(6.0-6.9)$ ;  $G_2=6.0(5.9-6.2)$ ; Odontostyle=102.8(100—105) $\mu$ m; Odontophore=63.0(62—65) $\mu$ m Spear=165.8(162—170) $\mu$ m; Guiding ring to front end=95.2(93—98) $\mu$ m; Tail length=123(110—130) $\mu$ m; Tail length/Anal body width=4.8(4.4—5.4)

Body ventrally curved into C-shape by heat widest at middle, tapering very gradually towards both extremities. Lip region rounded and confluent with the body. Ampid aperture slightly wider than half of the the lip width. Oesophageal bulb rectangular, measuring 19—22 $\times$ 100—105 $\mu$ m in female. Cardia conoid, 8 $\mu$ m wide, 10 $\mu$ m long. Odontostyle 102(100—105 $\mu$ m long, odontophore 63(62—65) $\mu$ m long. Flanges well-developed, 9.0—11.0 $\mu$ m wide. Guiding ring situated 95.2(93—98) $\mu$ m from anterior end. Never ring about 200—210 $\mu$ m from anterior end. Hemizonid 200 $\mu$ m from anterior end, and 24 $\mu$ m

from base of spear flanges. Vulva transverse slit. Vagina about onehalf body width deep. Female gonads didelphic, anterior gonad extending 173—215 $\mu$ m long and posterior gonad 178—185 $\mu$ m long. Tail elongate-conoid, bent ventrally. Terminus bluntly rounded, 110—130 $\mu$ m long. Tail length divided by anal body diameter is 4.4—5.4. Female tail with four caudal papillae. The specimens correspond with the original description except that spear slightly short and tail length slightly long.

Male: Not found.

Locality and habitat: Soil around roots of garlic (*Allium sativum* L. var. *pekinense* Makino) from Yöngdöök and peanut (*Arachis hypogaea* L.) from Dasan, Kyung-sangbuk-do.

#### REFERENCES CITED

- Choi, Y.E. 1963. Studies on the important nematodes in Korea. 1. Some nematodes found on the soil around the root of floral plants in the greenhouse. Kor. J. pl. Prot. 2 : 27—37.
- Chon, E. & Sher, S.A. 1972. A contribution to the taxonomy of the genus *Xiphinema* Cobb, 1913. Journal of Nematology. 4 : 36—65.
- Esser, R.P. 1973. A diagnostic species compendium of the genus *Xiphinema* Cobb, 1913. Proc. Soil and Crop Science Soc., Florida 33 : 88—92.
- Heyns, J. 1965. Four new species of the genus *Xiphinema* (Nematoda: Dorylaimoidea) from South Africa. Nematologica(1965) : 87—99.
- Heyns, J. 1979. The genus *Xiphinema* in South Africa. V. *X. zulu* Heyns, 1965 and related species in the *X. hallei* group (Nematoda: Dorylaimida). Phytophylactica 11 : 13—22
- Lee, Y.B. & Han, S.C. 1976. The nematode genus *Xiphinema* (Dorylaimida: Longidoridae) from Korea. Kor.J. Pl. Prot. 15 : 17—21.
- Luc, M. 1958. *Xiphinema* de l'ouest Africain: Description de cinq nouvelles especes (Nematoda: Dorylaimidae) Nematologica 3 : 57—72.
- Loof, P.A.A. & Maas, P.W. TH. 1972. The genus *Xiphinema* (Dorylaimida) in Surinam. Nematologica 18 : 92—119.
- Park, J.S. 1963. Survey on the kind and distribution of plant parasitic nematodes in Korea. Res. Rept. ORD. 6 : 27—44.

- Seinhorst, J.W. 1959. A rapid method for the transfer of nematodes from fixative to anhydrous glycerin. *Nematologica* 4 : 67-69.
- Siddiqi, M.R. 1962. Studies on the genus *Longidorus* Micoletzky, 1922 (Nematoda: Dorylaimoidea), with description of three new species. *Proc. Helminth. Soc. Wash.*, Vol. 29 : 177-188.
- . 1965. *Longidorus nirulai* n. sp., a parasite of potato plants in Shillong, India with a key to species of *Longidorus*(Nematoda: Dorylaimoidea). *Proc. Helminth. Soc. Wash.*, Vol. 32 : 95-99.
- Tarjan, A.C. 1964. Two new american dagg nematodes (Xiphinema: Dorylaimida) associated with citrus, with comments on the variability of *X. bakeri* Williams, 1961. *Proc. Helminth. Soc. Wash.*, Vol. 31 : 65-76.
- Thorne, G. 1939. A monograph of the nematodes of the superfamily Dorylaimoidea. *Capita zool.* 8 : 1-263.
- Taylor, C.E. 1972. Nematode transmission of plant viruses. *Pars* 18 : 269-282.

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