

## An Unrecorded Species of *Pratylenchus loosi* Loof (Tylenchida: Pratylenchidae) from Tea in Korea

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### 韓國未記錄 차나무뿌리썩이선충, *Pratylenchus loosi* Loof (참선충목: 뿌리썩이선충과)

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**ABSTRACT :** *Pratylenchus loosi* Loof, 1960 is recorded for the first time from Korea. The nematode was isolated from the roots of tea (*Thea sinensis* L.) and soil around the roots from Yeongam-gun, Jeollanam-do and Namjeju-gun, Jeju-do, Korea. This species has two lip annuli. The female is 433-646  $\mu\text{m}$  long: a = 29.1-37.5, b = 5.1-6.4, c = 15.0-21.3, vulva (%) = 73.0-85.4. The male body length is 408-512  $\mu\text{m}$  long: a = 36.1-40.0, b = 4.8-6.7, c = 17.0-19.0, and spicule = 14.1-18.0  $\mu\text{m}$ . The stylet is 11.6-18.0  $\mu\text{m}$  long and the number of incisures is four. The shape of spermatheca filled with sperm is broadly rounded, oval and quadrangular. The shape of tail is narrowly round to subacute.

**KEY WORDS :** Systematics, Tylenchida, *Pratylenchus loosi*, Description

**초 록 :** 차나무뿌리썩이선충(*Pratylenchus loosi*)이 국내에서 처음으로 전라남도 영암군과 제주도 남제주군의 차나무 뿌리와 주변 흙에서 발견되었다. 차나무뿌리썩이선충의 두부주름은 2개이며 암컷의 길이는 433-646  $\mu\text{m}$ 이고, a = 29.1-37.5, b = 5.1-6.4, c = 15.0-21.3, vulva (%) = 73.0-85.4였다. 수컷의 몸길이는 408-512  $\mu\text{m}$ 였으며 a = 36.1-40.0, b = 4.8-6.7, c = 17.0-19.0, spicule = 14.1-18.0  $\mu\text{m}$ 였다. 구침의 길이는 11.6-18.0  $\mu\text{m}$ 였으며, 측선의 갯수는 4개였다. 저정낭은 정자로 차 있으며, 모양은 둥근 고치모양 또는 직사각형 모양이다. 꼬리의 형태는 가늘고 끝이 둥글거나 뾰족하다.

**검색어 :** 분류, 참선충목, 차나무뿌리썩이선충

*Pratylenchus loosi* Loof, 1960 is a serious nematode pest of tea (*Thea sinensis* L.) in Sri Lanka. It has been reported from citrus, apple, pear (Seinhorst, 1977). The species was found from the roots of tea and soil around the roots from Yeongam-gun, Jeollanam-do and Namjeju-gun, Jeju-do, Korea. In this paper, morphological characteristics of the species is described and illustrated in detail for the first time in Korea.

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### Materials and Methods

The nematode was collected from the roots of tea

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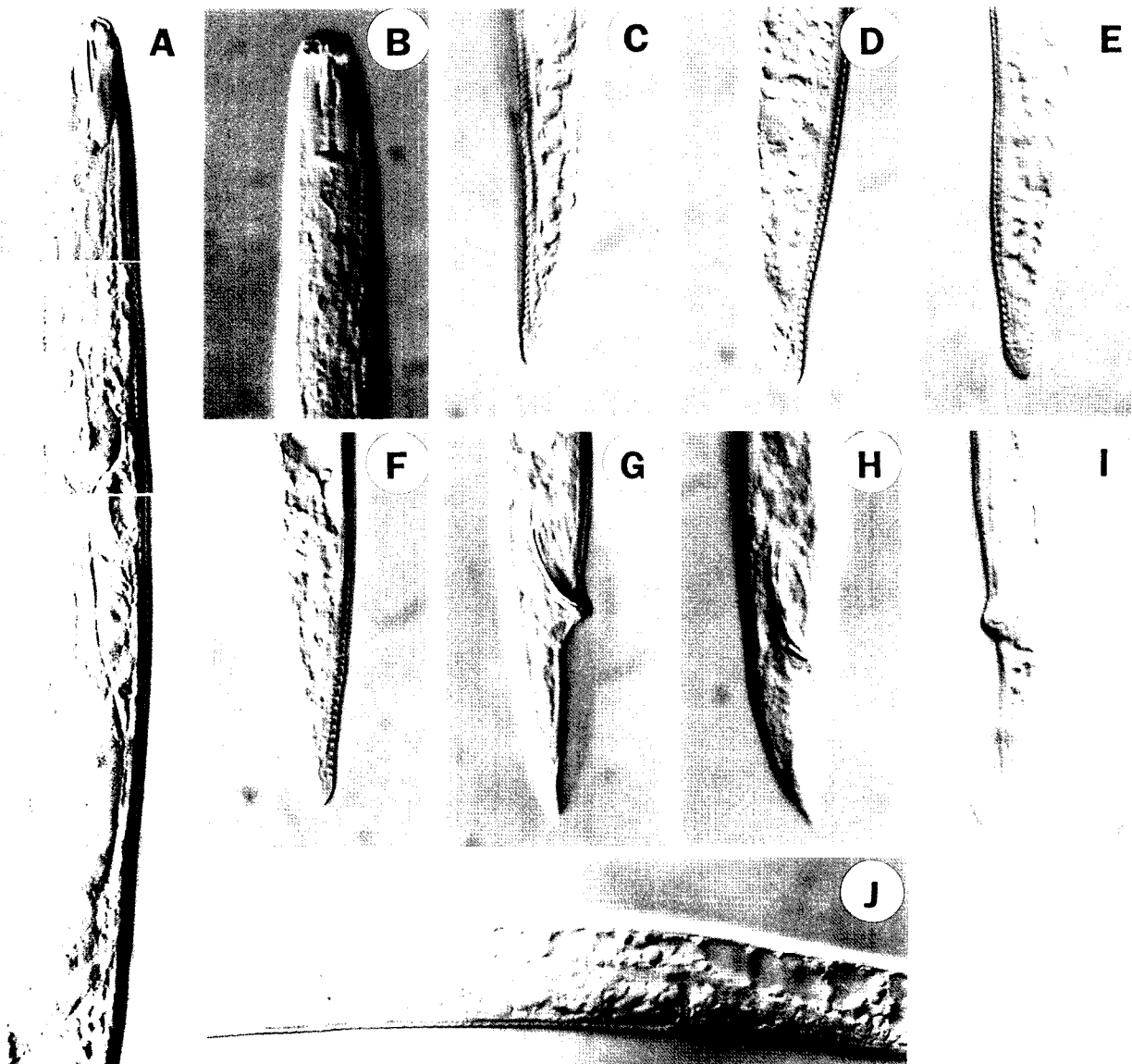
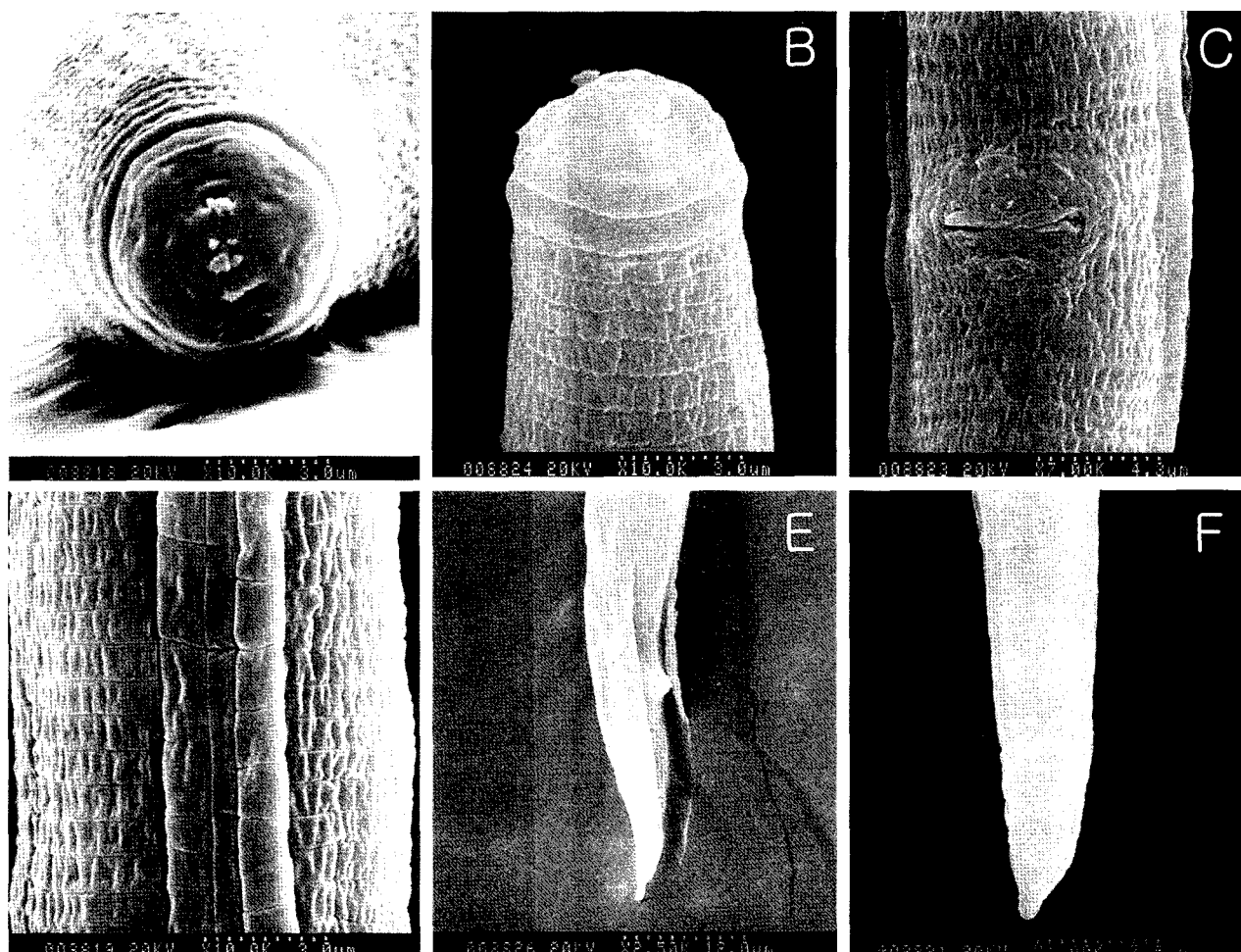


Fig. 1. Photomicrographs of *Pratylenchus loosi*. A: Female anterior part; B: Male anterior part; C-F: Female tail; G-I: Male tail, J: Female gonad.

(*Thea sinensis* L.) and soil around the roots from Yeongam-Gun, Jeollanam-do and Namjeju-gun, Jeju-do, Korea in 2000. The nematodes extracted by modified Baermann funnel method were fixed in hot (80°C) TAF fixative and dehydrated by Seinhorst's rapid glycerin method. The specimens of identification were done with a Key made by Handoo (Handoo Z. A. 1989). Measurements and drawings were made with a microscope equipped with a drawing tube attachment.

In addition, the nematodes were fixed in 1% glutaraldehyde in a 0.1 M sodium phosphate buffer (pH 7.0),

for 90 minutes. The fixed samples were rinsed 4 times with distilled water and post-fixed with the buffered 1% OsO<sub>4</sub> for 90 minutes. The double fixed samples were rinsed 2 times with distilled water and dehydrated with an ethanol series in six steps (50%, 75%, 90%, 95%, 100% and 100%). The dehydrated samples were dried with liquid CO<sub>2</sub> by using critical point drier (Hitachi HCP-2) after double treatments with amylacetate for 30 minutes. The dehydrated samples were transferred to the specimen stubs affixed with the adhesive tape and were coated with gold ions (Eiko IB 3). Electron microscopy

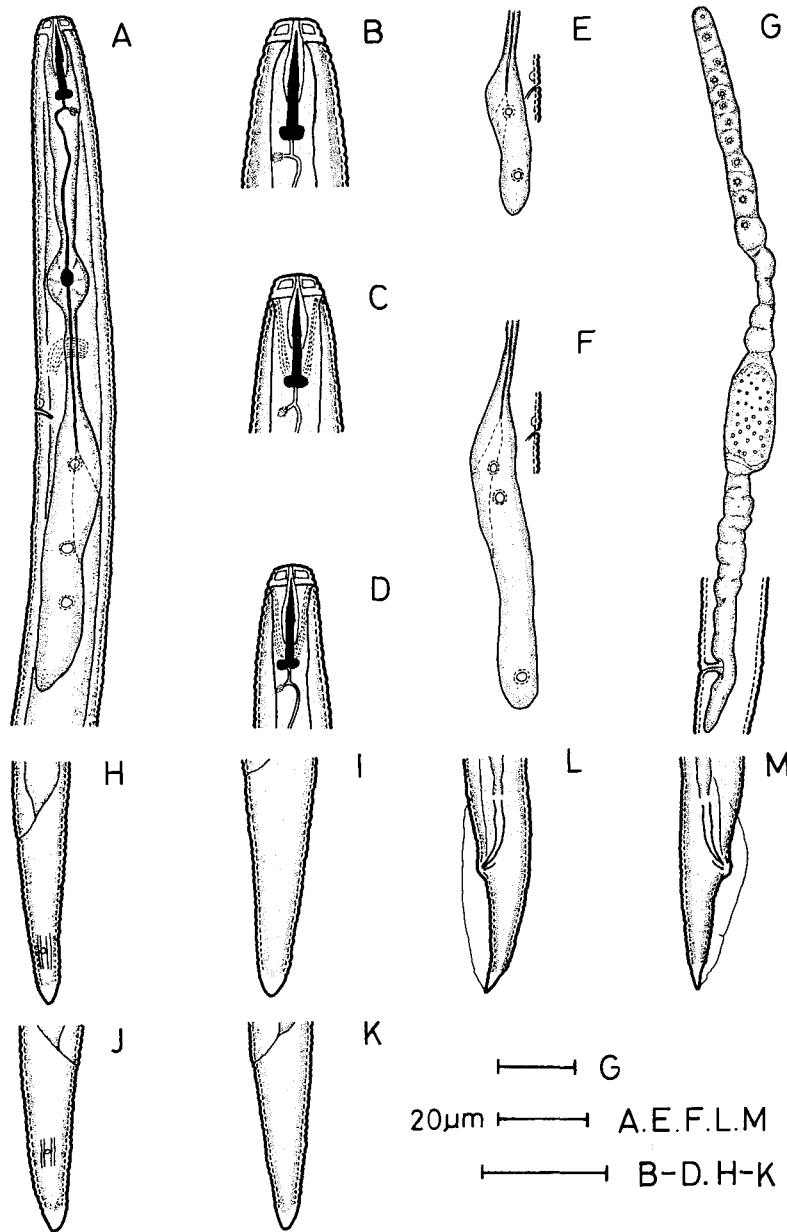


**Fig. 2.** SEM micrographs of *Pratylenchus loosi*. A: Face view (female); B: Female head with two annuli; C: Vulva region; D: Lateral incisures; E: Male tail; F: Female tail.

**Table 1.** Measurements of *Pratylenchus loosi* Loof from *Thea sinensis* L. from Korea

Character	Female (n = 17)		Male (n = 4)	
	Mean $\pm$ SD	Range	Mean $\pm$ SD	Range
Body length (mm)	0.55 $\pm$ 0.07	0.43-0.65	0.44 $\pm$ 0.05	0.41-0.51
a	33.3 $\pm$ 2.3	29.1-37.6	38.4 $\pm$ 1.8	36.3-40.0
b	5.78 $\pm$ 0.4	5.1-6.4	5.4 $\pm$ 0.9	4.8-6.7
b'	3.8 $\pm$ 0.2	3.5-4.1	3.9 $\pm$ 0.5	3.6-4.6
c	19.0 $\pm$ 1.9	15.0-21.9	18.4 $\pm$ 0.6	17.7-19.0
V (%)	82.0 $\pm$ 1.7	78.4-85.4	—	—
Head to excretory pore ( $\mu$ m)	87.2 $\pm$ 6.8	73.0-98.6	72.6 $\pm$ 6.3	65.3-80.6
Stylet ( $\mu$ m)	15.8 $\pm$ 1.5	11.5-17.9	14.1 $\pm$ 1.1	12.8-15.4
Dorsal oesophageal gland opening ( $\mu$ m)	2.6 $\pm$ 0.02	2.56-2.63	2.6 $\pm$ 0.0	2.6-2.6
MB (%)*	39.6 $\pm$ 2.7	33.0-45.4	44.8 $\pm$ 2.9	41.9-47.6
Post uterine branch ( $\mu$ m)	21.7 $\pm$ 5.8	12.8-33.3		
Tail annuli	23.5 $\pm$ 1.8	20-27		
Spicule ( $\mu$ m)			15.7 $\pm$ 1.9	14.1-17.9
Gubernaculum ( $\mu$ m)			3.84 $\pm$ 0.0	3.84-3.84

\*MB (%): Distance of median bulb from anterior end  $\times$  100/total oesophageal length.



**Fig. 3.** Diagrams of *Pratylenchus loosi*. A: Female anterior part; B-D: Female head; E, F: Variation of oesophagus; H-K: Female tail; L-M: Male tail.

was conducted at 20 KV with Hitachi S-570 scanning electron microscope.

**Description of species**

***Pratylenchus loosi* Loof, 1960**

차나무뿌리썩이선충

**Measurements:** see Table 1.

**Female:** Body straight or slightly curved in specimens killed by heat. Lip region continuous with body contour, rounded, with two annuli; 7.2-8.0 µm wide and 2.4-3.2 µm high. Cephalic framework well developed. Stylet knobs rounded. Opening of dorsal oesophageal gland 2.56-2.63 µm posterior to stylet. Dorsal oesophageal glands elongated, 110.1-163.8 µm long, overlap the intestine ventrally. Lateral field broad with four incisions. Excretory pore 73.0-98.6 µm from head end,

hemizonid anterior to excretory pore. Female reproductive system monodelphic and outstretched. Spermatheca with sperm broadly rounded, oval and quadrangular. Postvulva uterine branch 12.8-33.3  $\mu\text{m}$ . Tail narrowly round to subacute. Ventural tail annuli 20-27 annules.

**Male:** Body shape similar to the female but generally small in size. Lip region 5.6-6.4  $\mu\text{m}$  wide and 1.9-2.0  $\mu\text{m}$  high. Stylet slightly shorter than female. Spicules and gubernaculum slightly curved. Gubernaculum 3.84  $\mu\text{m}$  long, bursal margins faintly crenate.

**Relationship:** Morphological characters of *P. loosi* are similar to those of *P. coffeae*. This species, however, is more slender, the vulva is more posterior and tail is more narrowly round to subacute than *P. coffeae* (Inserra, 1966).

**Locality and habitat:** Miam-myeon, Yeongam-gun, Jeollanamnam-do and Andeok-myeon, Namjeju-gun, Jeju-do, Korea. Roots and soils around *Thea sinensis* L. *Pratylenchus loosi* is a major pest of tea in Sri Lanka and India. The distribution of the species is limited in tea production areas of Sri Lanka and India in South-

western Asia, therefore, it is assumed that the nematode was introduced to Korea through tea seedlings imported from the region.

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