

## Two new species of free-living nematodes from the mouth of the Cam River, North Vietnam

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Descriptions and illustrations of *Terschellingia longisoma* sp. n. and *Sphaerotheristus parvus* sp. n. are given. *T. longisoma* sp. n. is close to *T. siphonolaimoides* (Wieser, 1956) and *T. capitata* Vitiello, 1969. It differs from *T. siphonolaimoides* in the shorter and thinner body, shorter cephalic setae, absence of cervical setae, position of vulva, and from *T. capitata* in the longer and thinner body, shorter and thicker tail and larger amphidial fovea. *S. parvus* sp. n. is close to *S. supoti* Timm, 1968, but differs from it in the shorter stoma and shorter and differently shaped spicules.

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### Introduction

The fauna of free-living nematodes in fresh-water bodies of Vietnam has been poorly studied. For the present study, samples were collected from mangrove overgrowth of the mouth of the Cam River by collaborators of Institute of Ecology and Biological Resources (Hanoi, Vietnam). Nematodes were fixed in cold TAF, processed to pure glycerin by a slow evaporation method (Seinhorst, 1959) and mounted in glycerin on permanent slides with paraffin as a coverslip support.

### Family LINHOMOEIDAE

#### *Terschellingia longisoma* sp. n. (Figs 1-7)

*Holotype*. ♂, **Vietnam**, Hai Phong Prov., mouth of Cam River, depth 1.5 m, silt, 10.VIII.2002, slide 1/2, deposited at Institute of Inland Waters Biology, Borok.

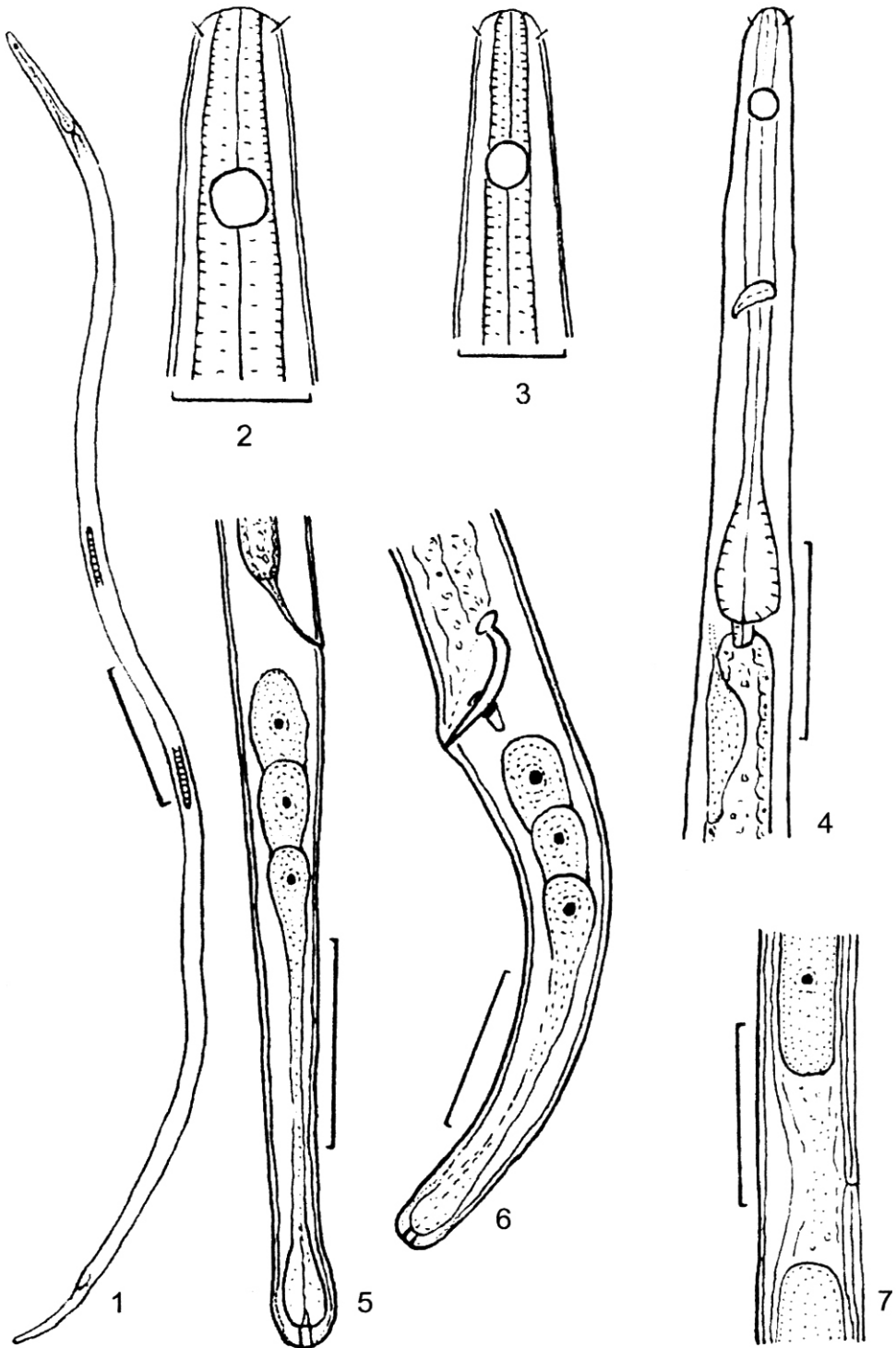
*Paratypes*. 1 ♂, 2 ♀, collected with holotype (1 ♀ deposited with holotype; 1 ♀ and 1 ♂ deposited at Institute of Ecology and Biological Resources, Hanoi).

*Measurements*. See Table 1.

*Description. Female*. Thin, comparatively long worms. Cuticle thin, 1.5 µm thick at midbody. Annulation of cuticle not seen under light microscope. Somatic setae absent. Front edge of head convex, not flattened. Lips not pronounced;

labial papillae not visible. Four short cephalic setae 2.5 µm long. Stoma absent. Amphidial fovea 5.5-6.0 µm in diameter (60-62% of the corresponding body width), circular; its anterior margin about two lip region widths from anterior body end; fusus amphidialis unclear. Pharynx weakly muscular, more or less cylindrical anteriorly, with a weakly developed basal bulb; gland nuclei unclear. Nerve ring situated at 50-52% of pharynx length. Cardia mushroom-shaped, 6.0-6.5 µm long. Renette situated ventrally, at beginning of intestine. Excretory pore not seen. Rectum approximately as long as anal body diameter. Reproductive system didelphic; ovaries straight, relatively short. Vagina short. Vulval lips not protruded; vulva anterior to midbody, crescent-shaped. Tail relatively thick, almost cylindrical; terminus round. Terminal and subterminal caudal setae absent. Caudal glands and spinneret present.

*Male*. Slightly longer than female. Cuticle 1.5 µm thick. Annulation of cuticle not seen under light microscope. Lips not pronounced; labial papillae not visible. Four cephalic setae 2.5 µm long. Amphidial fovea 6.5-7.0 µm in diameter (70 to 72% of the corresponding body diameter), circular; its anterior margin about two lip region widths from anterior body end. Stoma absent. Pharynx muscular, more or less cylindrical anteriorly, with a weakly developed basal bulb. Ren-



**Figs 1-7.** *Terschellingia longisoma* sp. n. 1, male, habitus; 2, male head; 3, female head; 4, male anterior body region; 5, female tail; 6, male tail; 7, vulva region. Scale bars: 200  $\mu$ m (1), 40  $\mu$ m (4, 7), 15  $\mu$ m (2, 3).

**Table 1.** Measurements of *Terschellingia longisoma* sp. n. (all measurements in  $\mu\text{m}$ ).

Characteristic	Holotype, male	Paratypes	
		Male	Two females
<i>L</i>	2156	1925	1695, 1614
<i>a</i>	90	80	85, 90
<i>b</i>	13.4	12.5	11.5, 12.4
<i>c</i>	16.2	16.2	12.6, 14.4
<i>c'</i>	6.3	5.7	8.0, 7.3
<i>V</i>	–	–	41.7, 43.2
Labial region width	10	10	10, 9
Cephalic setae length	2.0	2.0	2.5, 2.5
Amphidial fovea diameter	6.5	7.0	6.0, 5.5
Anterior body end – amphidial fovea	20	20	18, 17
Pharynx length	161	154	147, 130
Posterior end of pharynx – vulva	–	–	560, 567
Vulva – anus	–	–	854, 805
Posterior end of pharynx – cloaca	1862	1652	–
Tail length	133	119	134, 112
Spicule length (along arc)	27	25	–
Gubernaculum length	10	11	–

ette situated ventrally, at beginning of intestine. Excretory pore not seen. Cloaca approximately as long as corresponding body diameter. Testes two, opposite. Spicules thin, ventrally curved, with capitulum. Gubernaculum with large dorsal appendix (apophysis), 10-11  $\mu\text{m}$  long. Supplementments, preloacal and caudal setae absent. Caudal glands and spinneret present.

**Comparison.** The new species resembles *Terschellingia siphonolaimoides* (Wieser, 1956) and *T. capitata* Vitiello, 1969 in the position of amphids. It differs from the former in the shorter and thinner body (females  $L = 2.3$  mm,  $a = 40.3$ , males  $L = 2.32$  mm,  $a = 40.7$  in *T. siphonolaimoides* vs. females  $L = 1.614$ - $1.695$  mm,  $a = 85$ - $89$ , males  $L = 1.925$ - $2.156$  mm,  $a = 80$ - $90$  in *T. longisoma* sp. n.), shorter cephalic setae (9.0-10.5  $\mu\text{m}$  long in *T. siphonolaimoides* vs. 2.0  $\mu\text{m}$  in *T. longisoma* sp. n.), shorter spicules (45  $\mu\text{m}$  long in *T. siphonolaimoides* vs. 25-27  $\mu\text{m}$  in *T. longisoma* sp. n.), absence of cervical setae and more anterior position of vulva ( $V = 54.6\%$  in *T. siphonolaimoides* vs. 41.7-43.2% in *T. longisoma* sp. n.) (Wieser, 1956). The new species differs from *T. capitata* in the longer and thinner body ( $L = 1509$   $\mu\text{m}$ ,  $a = 52$  in male of *T. capitata* vs.  $L = 1.925$ - $2.156$  mm,  $a = 80$ - $90$  in males of *T. longisoma* sp. n.), shorter and thicker tail (male  $c =$

6.7,  $c' = 9.6$ , tail strongly attenuated to terminus in *T. capitata* vs.  $c = 16.2$ ,  $c' = 5.7$ - $6.3$  and tail very poorly attenuated to terminus in *T. longisoma* sp. n.), larger amphidial fovea (11  $\mu\text{m}$  long in male of *T. capitata* vs. 6.5-7.0  $\mu\text{m}$  in males of *T. longisoma* sp. n.) (Vitiello, 1969).

**Etymology.** The species name means “having long body”, “with long body”.

Family **XYALIDAE**

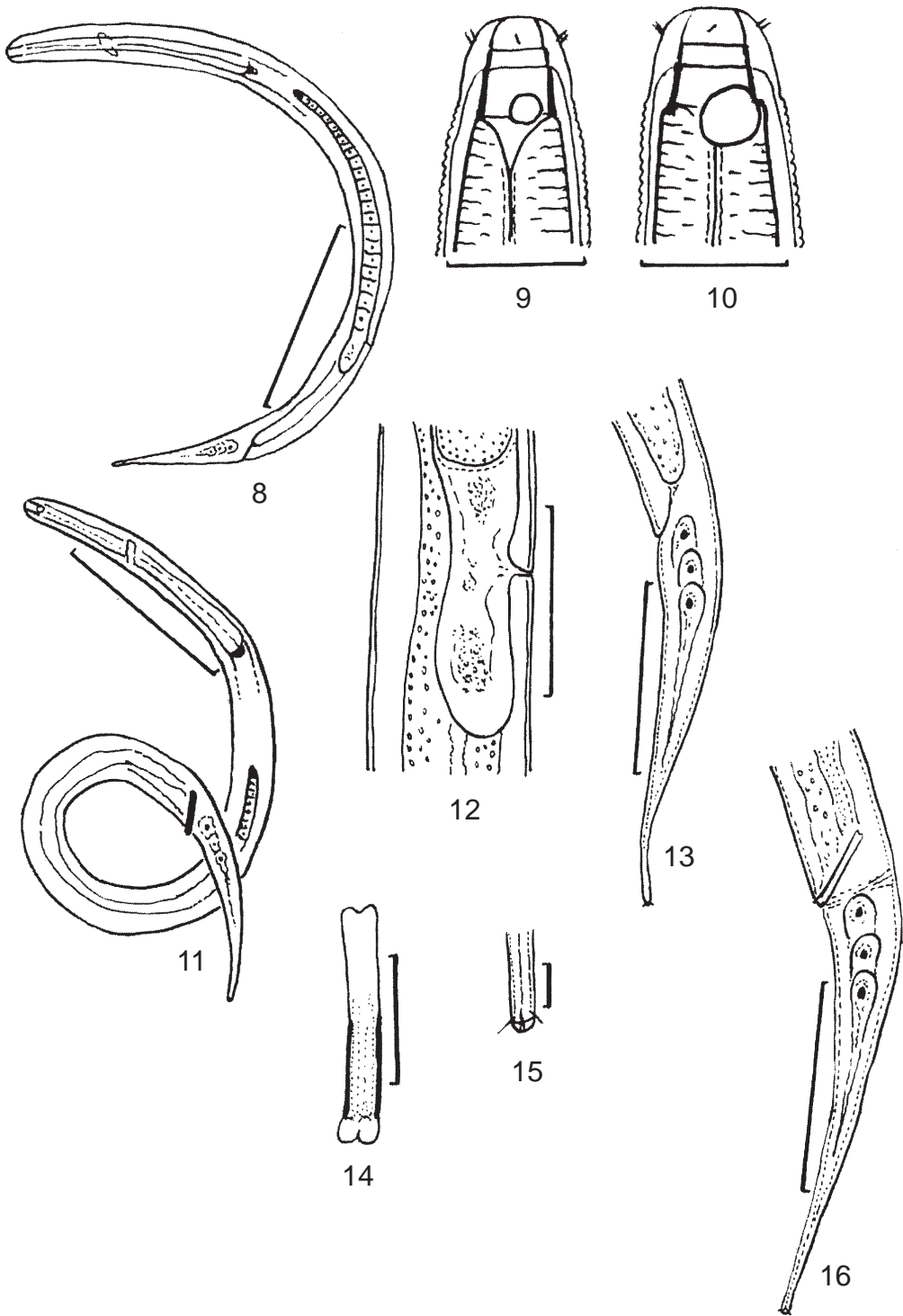
**Sphaerotheristus parvus** sp. n.  
(Figs 8-16)

**Holotype.** ♀, **Vietnam, Hai Phong Prov.**, mouth of Cam River, depth 1.0 m, ground silt, 15.VIII.2002, slide 3/2, deposited at Institute of Inland Waters Biology, Borok.

**Paratypes.** 1 ♂, 2 ♀, collected with holotype (1 ♂ deposited with holotype; 2 ♀ deposited at Institute of Ecology and Biological Resources, Hanoi).

**Measurements.** See Table 2.

**Description. Female.** Small slender worms. Body after fixation strongly curved ventrad. Cuticle 1.0-1.2  $\mu\text{m}$  thick at midbody, annulated; annules 0.5-0.6  $\mu\text{m}$  at midbody. Somatic setae absent. Head demarcated from adjacent body by narrowing and lack of annulation. Front edge of head convex. Labial papillae not visible. Two closely arranged circles (6+4) of 2  $\mu\text{m}$  long se-



**Figs 8-16.** *Sphaerotheristus parvus* sp. n. 8, female, habitus; 9, female head; 10, male head; 11, male, habitus; 12, vulva region; 13, female tail; 14, spiculum; 15, tail tip; 16, male tail. Scale bars: 100  $\mu$ m (8, 11), 40  $\mu$ m (13, 16), 25  $\mu$ m (12), 10  $\mu$ m (9, 10, 14), 5  $\mu$ m (15).

**Table 2.** Measurements of *Sphaerotheristus parvus* sp. n. (all measurements in µm).

Characteristic	Holotype, female	Paratypes	
		Male	Two females
<i>L</i>	468	437	405, 465
<i>a</i>	23	22	23, 22
<i>b</i>	3.3	3.5	3.4, 3.6
<i>c</i>	6.4	5.9	5.3, 6.0
<i>c'</i>	5.8	4.8	6.1, 5.5
<i>V</i>	66.4	–	63.7, 71.4
Labial region width	7.0	7.0	7.0, 7.5
Cephalic setae length	2.0	2.0	2.0
Cephalic setae / labial region width (%)	29	29	29, 27
Stoma length	9	8	9, 8
Anterior body end – amphidial fovea	7.0	8.0	7.0, 7.5
Amphidial fovea diameter	4.5	6.0	4.0, 4.5
Pharynx length	140	125	118, 129
Posterior end of pharynx – vulva	171	–	140, 203
Vulva – anus	84	–	70, 56
Posterior end of pharynx – cloaca	–	238	–
Tail length	73	74	77
Postvulvar uterine sac length	20	–	22, 20
Spicule length (along arc)	–	17	–

tae. Stoma comparatively thin, with sclerotized walls, divided into three sections. Total length of stoma 1.3-1.4 times labial region width; middle section of stoma the smallest. Amphidial fovea circular, 4.0-4.5 µm in diameter (29-30% of corresponding body diameter), circular; its anterior margin about at 0.9-1.0 lip region width from anterior body end. Pharynx slender, weakly muscular, with a weakly developed basal expansion. Cardia mushroom-shaped, approximately as long as corresponding body diameter. Nerve ring situated at 48 to 52% of pharynx length. Renette and excretory pore not seen. Rectum as long or slightly longer than anal body diameter. Reproductive system monodelphic, prodelphic, situated on the right side of intestine. Germinal zone of oogonia arranged in one or two rows; growth zone with a single row of gradually enlarging oocytes. Postvulvar uterine sac slightly longer than corresponding body diameter. Uterus and postvulvar uterine sac usually filled with sperm mass. Vagina short. Vulva posterior to midbody, crescent-shaped. Vulva lips not protruded. Tail elongate conoid, gradually tapering to a cylindrical end part. Caudal glands inconspicuous, arranged in tandem; spinneret present. Two short

setae (spines) situated subterminally at tip.

*Male.* Similar to female in general morphology. Body after fixation strongly curved ventrad, more so in posterior part. Cuticle 1.0 µm thick at midbody, annulated. Somatic setae absent. Head demarcated from adjacent body by narrowing, not annulated. Labial papillae not visible. Two closely associated circles (6+4) of 2 µm long setae. Stoma in form of thin tube, with sclerotized walls, divided into three sections, 1.3 times as long as labial region width; middle section of stoma the smallest. Amphidial fovea circular, 6.0 µm in diameter (58% of corresponding body diameter), circular; its anterior margin at level of stoma basis. Pharynx slender, muscular, with a weakly developed basal expansion. Cardia mushroom-shaped. Renette and excretory pore not seen. Cloaca as long as cloacal body diameter. Reproductive system monorchic, proorchic, with outstretched testis, situated at right side of intestine. Spicules straight, thick, non-cephalated, 1.1 times as long as cloacal body diameter, with two large knobs at tip. Gubernaculum absent. Tail elongate conical, gradually tapering. Caudal glands arranged in tandem; spinneret present. Two setae situated subterminally at tip.

**Comparison.** The new species is resembling *S. supoti* Timm, 1968 in the length of body and structure of stoma, differing from the latter in the shorter stoma (10-11  $\mu\text{m}$  long in *S. supoti* vs. 8-9  $\mu\text{m}$  in *S. parvus* sp. n.) and shorter and differently shaped spicules (spicules thin, curved, 23-25  $\mu\text{m}$  long in *S. supoti* vs. straight and thicker, 17  $\mu\text{m}$  long in *S. parvus* sp. n.) (Timm, 1968).

**Etymology.** The species name means "small".

#### Acknowledgements

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