

Four unrecorded species of free-living nematodes from the sublittoral zone in the East Sea, Korea

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Four species of the free-living nematodes were collected from marine sediments in the sublittoral zone in the East Sea, Korea and were identified, described, and illustrated. *Paranticoma tricerviseta* Zhang, 2005, originally described from the Bohai Sea, China, is recorded for the first time in the East Sea, Korea; only in body length and thickness (1902–2282 μm compared to 2472–3300 μm , 50–62 μm compared to 57–82 μm , respectively). Specimens of *Parodontophora marina* Zhang, 1991, from East Sea, Korea largely agrees with the original description of Zhang (1991) of nematodes from the Bohai Sea, except for differences in body length and thickness (1190–1345 μm compared to 1235–1408 μm , 40–44 μm compared to 42–72 μm). *Terschellingia longicaudata* de Man, 1907 is reported for the first time in Korea, but was previously considered a cosmopolitan species of nematodes with a widespread distribution from the North Sea, Belgium to the Exclusive Economic Zone of New Zealand; it differs from the original description in body thickness (30–38 μm vs. 40–62 μm). *Vasostoma brevispicula* Huang & Wu, 2011, originally described from the subtidal muddy sediment in the Yellow Sea, China, is newly reported in Korea; apart from a few minor morphological differences, body length and thickness (2009–2425 μm vs. 2119–2906 μm , 41–48 μm vs. 37–58 μm). The present study on unrecorded species improves our understanding of nematode species diversity in Korean waters.

Keywords: East Sea, *Paranticoma*, *Parodontophora*, *Terschellingia*, *Vasostoma*

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INTRODUCTION

During the “Marine Biological Resources Survey Project” on marine nematodes in Korea from 2022 to 2023, we discovered over 40 species of free-living nematodes in the East Sea, including four previously unrecorded species belonging to the genera *Paranticoma*, *Parodontophora*, *Terschellingia*, and *Vasostoma*. The genus *Paranticoma* is distinguished by its cup-shaped buccal cavity, an excretory pore situated on a setae-like projection of the cuticle, a single testis, and reduced or vestigial supplementary organs (Micoletzky and Kreis, 1930; Zhang, 2005). The genus *Paranticoma* was established by Micoletzky & Kreis in 1930, with the type species being *P. bandaensis* Micoletzky & Kreis, 1930. To date, 10 species of *Paranticoma* have been described. The genus *Parodontophora*, established by Timm in 1963, currently comprises 28 known species. The type species of the genus is *P. paragranelifera* (Timm, 1952). The genus *Parodontophora* is characterized by several key features,

including amphids that are loop-shaped with a longer ventral branch, a deep and cylindrical buccal cavity with six large odontia, a smooth cuticle, opisthocephalic setae, outstretched two gonads, and typically the presence of preloacal supplements (Fonseca and Bezerra, 2014; Li and Guo, 2016). The genus *Terschellingia* de Man, 1888 is characterized by four cephalic setae, a small or absent buccal cavity, and a circular amphidial fovea located far forward on the head region (de Man, 1888; Armenteros *et al.*, 2009). *Terschellingia* was erected by de Man in 1888 with the type species *T. communis*, and to date 25 species of *Terschellingia* have been described. As of now, eight species are recognized within the genus *Vasostoma*, established by Wieser in 1954, with the type species being *V. spiratum*. The genus *Vasostoma* is characterized by a cylindrical buccal cavity with three small acute projections in the anterior part, undifferentiated laterally cuticle, bent spicules, dorsocaudally directed gubernacular apophyse, preloacal supplements (Wieser, 1954; Huang and Wu, 2011). This paper describes for the first time four

known species belonging to these four genera, collected in the East Sea, Korea.

MATERIALS AND METHODS

During a survey on the meiofauna community along the coast of Korea, specimens of *Paranticoma*, *Parodontophora*, and *Vasostoma* were collected off the coast of Gijang (35°16'0.0"N, 129°16'50.0"E, at a depth of 16 m, in clay sediment) on April 30, 2023. *Terschellingia* specimens were collected off the coast of Yangyang (38°4'50.2"N, 128°42'32.9"E, at a depth of 68 m, in the clay sediment) on 6 May 2022. Sediment samples collected with using a 0.1 m² Smith-McIntyre grab, and meiofauna samples were obtained using a hand-held corer (surface area: 10 cm², depth: 5 cm). All samples were promptly fixed in 4% neutral buffered formalin at room temperature. In the laboratory, meiofauna were extracted following the protocol outlined by Burgess (2001), and nematodes were sorted using a grid Petri dish under a stereoscopic microscope (SAPO; Leica, Wetzlar, Germany). The sorted nematodes were subsequently transferred into Seinhorst solution for dehydration and underwent infiltration with glycerine using the glycerine-ethanol method (Seinhorst, 1959). Then nematode specimens were mounted in anhydrous glycerine on glass slides with glass beads, the bead size being selected according to the nematode diameter, using a standard wax-ring method (Hooper, 1986). For taxonomic studies, the nematode specimens were examined under a 100× oil immersion objective with Nomarski Differential Interference Contrast (DIC) illumination. Drawings were made with an optical microscope (BX-51; Olympus, Tokyo, Japan) using a camera lucida. All morphometric measurements were obtained from the figures using a digital map-measurer and Zeiss AxioVision software Version 4.9.1.0 (Carl Zeiss Microscopy; Oberkochen, Germany). The classification employed follows that provided by de Ley and Blaxter (2004). The abbreviations used are as follows: a - body length divided by maximum body diameter; abd - anal body diameter (μm); AL - distance from the anterior to the anterior edge of the amphidia fovea (μm); amp - diameter of amphidial fovea (μm); amp cbd - corresponding body diameter at the level of amphidial fovea (μm); ampdb - dorsal branch length of amphidial fovea (μm); ampvb - ventral branch length of amphidial fovea (μm); ao - length of the anterior ovary, measured from the vulva (μm); at - length of the anterior testis, measured from the cloaca (μm); b - body length divided by pharynx length; BL - buccal cavity length (μm); bcd - buccal cavity diameter (μm); c - body length divided by tail length; c' - tail length divided by anal body diameter; car-length of cardia (μm); cbd - corresponding body diameter (μm); cep - length of cephalic

setae (μm); CEPL - distance from the anterior to the cephalic setae (μm); cer - length of cervical setae (μm); cylin - length of the cylindrical tail portion (μm); cylin% - cylindrical tail portion length as a percentage of tail length; dps: distance from the cloaca to precloacal setae (μm); EPL - distance of the ventral excretory pore from the anterior end of the body (μm); gub - length of gubernacular apophyses (μm); hd - diameter at the level of cephalic setae (μm); ils - length of inner labial setae (μm); L - total body length (μm); mbd - maximum body diameter (μm); N% - Nerve ring distance from the anterior end as a percentage of pharynx length; Ncbd - corresponding body diameter at the nerve ring (μm); NL - nerve ring from anterior end of body (μm); nps - number of precloacal supplements; ols - length of outer labial setae (μm); opcs - length of Opisthocephalic setae; Pb - pharynx bulb width (μm); P cbd - corresponding body length (μm); po - length of the posterior ovary, measured from the vulva (μm); pt - length of the posterior testis, measured from the cloaca (μm); RGL - Renette gland length (μm); s - spicule length as arc length divided by anal body diameter; spia - spicule length as arc (μm); TEL - length of teeth (μm); ter - length of terminal setae (μm); TL - tail length (μm); V% - vulva distance from the anterior end as a percentage of total body length; V cbd - corresponding body diameter at vulva (μm); VL - distance from the anterior end to the vulva (μm).

RESULTS AND DISCUSSIONS

Class Enoplea Inglis, 1983

Subclass Enoplia Pearse, 1942

Order Enoplida Filipjev, 1929

Family Anticomidae Filipjev, 1918

Genus *Paranticoma* Micoletzky & Kreis, 1930

Paranticoma tricerviseta Zhang, 2005 (Fig. 1, Table 1)

Locality. The coast of Gijang; subtidal southern part of the East Sea, Korea (35°16'0.0"N, 129°16'50.0"E), at a depth of 16 m, in the clay sediment.

Material. Four males (MABIK NA00158060, MABIK NA00158086–MABIK NA00158088) and three females (MABIK NA00158089–MABIK NA00158091) were collected by Jung-Ho Hong at the coast of Gijang on 30 April 2023, from the Research Vessel Haeyanghwnan-gkyung 3.

Measurements. See Table 1 for detailed measurements and morphometric ratios.

Description. Males (Fig. 1, Table 1). Body cylindrical, gradually tapering toward both extremities with anterior body end strongly narrowed. Cuticle smooth, with short and scattered somatic setae. Tail conico-cylindrical. Six

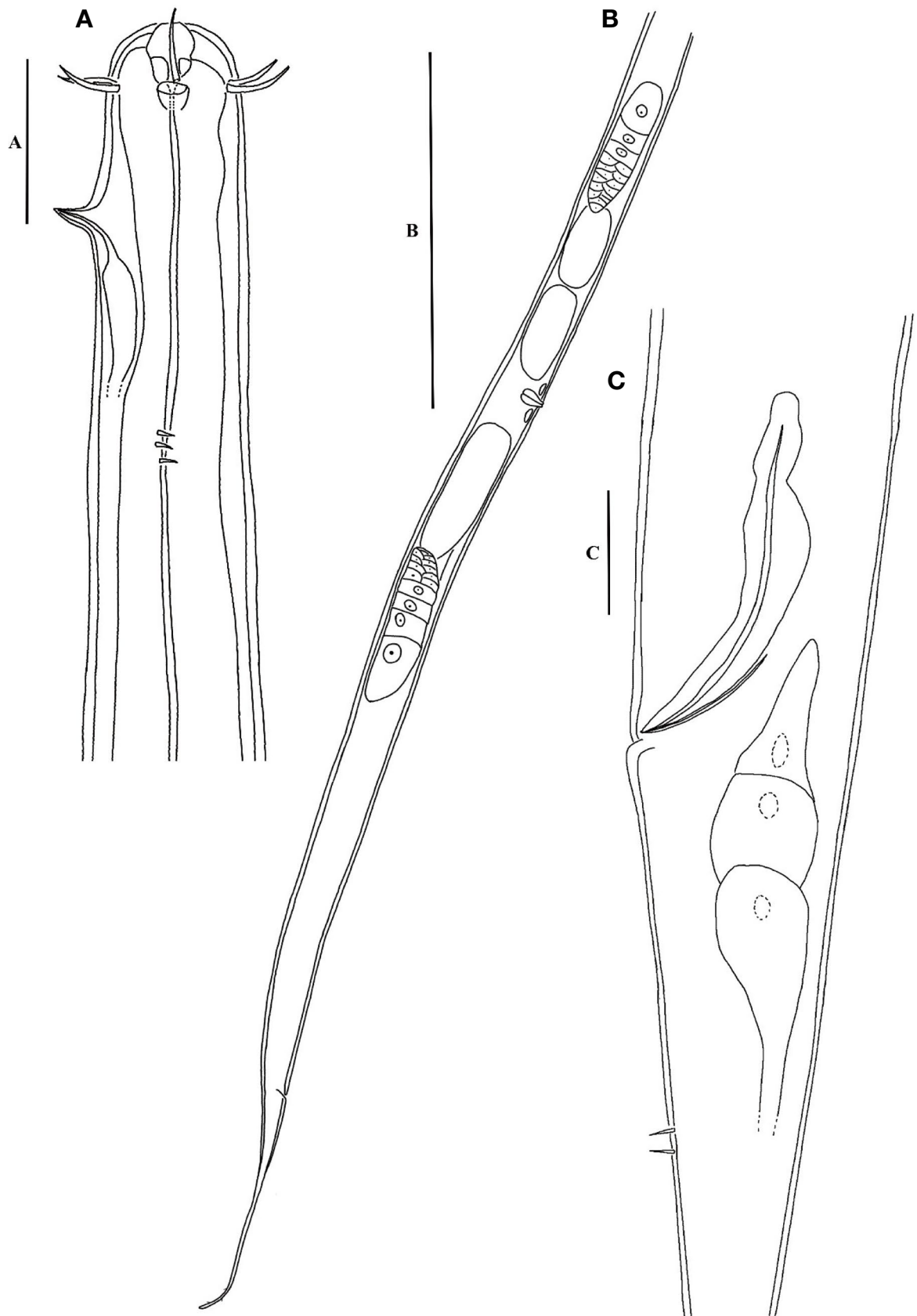


Fig. 1. *Paranticoma tricerviseta* Zhang, 2005, from the East Sea, Korea. A, Male head; B, Female vulva and tail; C, Male preloacal and anal region. Scale bars: 20 µm (A, C) and 500 µm (B).

Table 1. Morphometrics of *Paranticoma tricerviseta* Zhang, 2005, from the East Sea, Korea and *P. tricerviseta* Zhang, 2005, from Bohai Sea, China.

Characters	<i>P. tricerviseta</i> from the East Sea, Korea		<i>P. tricerviseta</i> ^a from the Bohai Sea, China
	♂; n = 4	♀; n = 3	♂; n = 7, ♀; n = 3
L	1902–2282	2178–2254	2472–3300
mbd	50–56	59–62	57–82
hd	14–16	16–16	14–17
cep	8–9	9–9	8.5–11.0
CSL	45–52	55–59	51–64
AL	6–7	7–8	6–8
amp	4–5	5–6	5–6
amp cbd	14–16	16–16	16–17
EPL	18–23	23–25	20–24
PL	485–580	530–565	592–700
P cbd	48–59	58–59	58–65
V%	n/a	51.9–54.1	45.9–58.7
abd	34–40	37–40	38–55
spia	42–50	n/a	47–62
s	1.2–1.3	n/a	1.1–1.3
gub	16–22	n/a	17–26
TL	236–272	259–270	268–354
a	38–41	35–38	35–44
b	3.9–4.0	3.9–4.1	3.9–4.5
c	8.1–8.5	7.9–8.3	7.8–8.4
c'	6.4–6.9	6.9–7.1	6.4–7.8

All measurements are in μm unless otherwise specified, with the exception of a, b, c, c', s. n/a indicates not applicable.
Literature sources: ^aZhang, 2005.

small, rounded labial papillae. Six longer cephalic setae arranged in one circle measuring 8–9 μm (about 53.3–60.0 of head diameter). Three short cervical setae (about 2 μm) situated laterally, on both sides of body located 45–52 μm from anterior body end. Buccal cavity small, conical shape with three indistinct, weakly sclerotized, tooth-like pieces. Amphidial fovea cup-shaped, indistinct measuring 4–5 μm in width (28.6–31.3% of cbd, with opening slightly behind a circle of cephalic setae. Pharynx relatively long (485–580 μm), muscular, slightly broadened at its base (48–59% of cbd). Cardia small. Excretory pore located on seta-like projection of cuticle situated 18–23 μm from anterior body end. Renette not observed. One testis, located to left of intestine. Two thin, curved spicules (42–50 μm) with ventral side projection measuring 1.2–1.3 times as long as cloacal body diameter. Gubernaculum 16–22 μm long, no apophyses. Precloacal supplements absent. Tail consists of proximal conical and distal cylindrical parts, with latter comprising 60–66% of tail length and featuring somatic setae. Caudal glands and spinneret well-developed. Two pairs of postanal subventral

setae, each measuring 4–5 μm in length and located 60–69 μm from anus.

Females (Fig. 1, Table 1). Similar to male. Reproductive system didelphic, amphidelphic. Ovaries situated to left of intestine, reflexed and comparatively short. Vulva situated slightly posterior to mid-body, at 51.9–54.1% of body length.

Remarks. To date, the genus *Paranticoma* Micoletzky, 1930 contains 10 valid species: *P. antarctica* Mawson, 1956; *P. bandaense* Micoletzky, 1930; *P. calidomensis* Inglis, 1967; *P. elegans* Micoletzky, 1930; *P. lepta* Phan Ke Long, Nguyen Dinh Tu & Gagarin, 2019; *P. odhneri* Allgén, 1959; *P. profunda* Micoletzky, 1930; *P. tenuis* Allgén, 1947; *P. tricerviseta* Zhang, 2005; *P. tubulifora* Wieser, 1953 (Nemys, 2023). The specimens from the East Sea, Korea, generally conform to the original description by Zhang (2005), with minor variations observed in body width (45–59 μm compared to 57–82 μm), body length (1902–2282 μm compared to 2472–3300 μm), and spicule length (42–50 μm compared to 47–62 μm). We interpret this variation as intraspecific diversity.

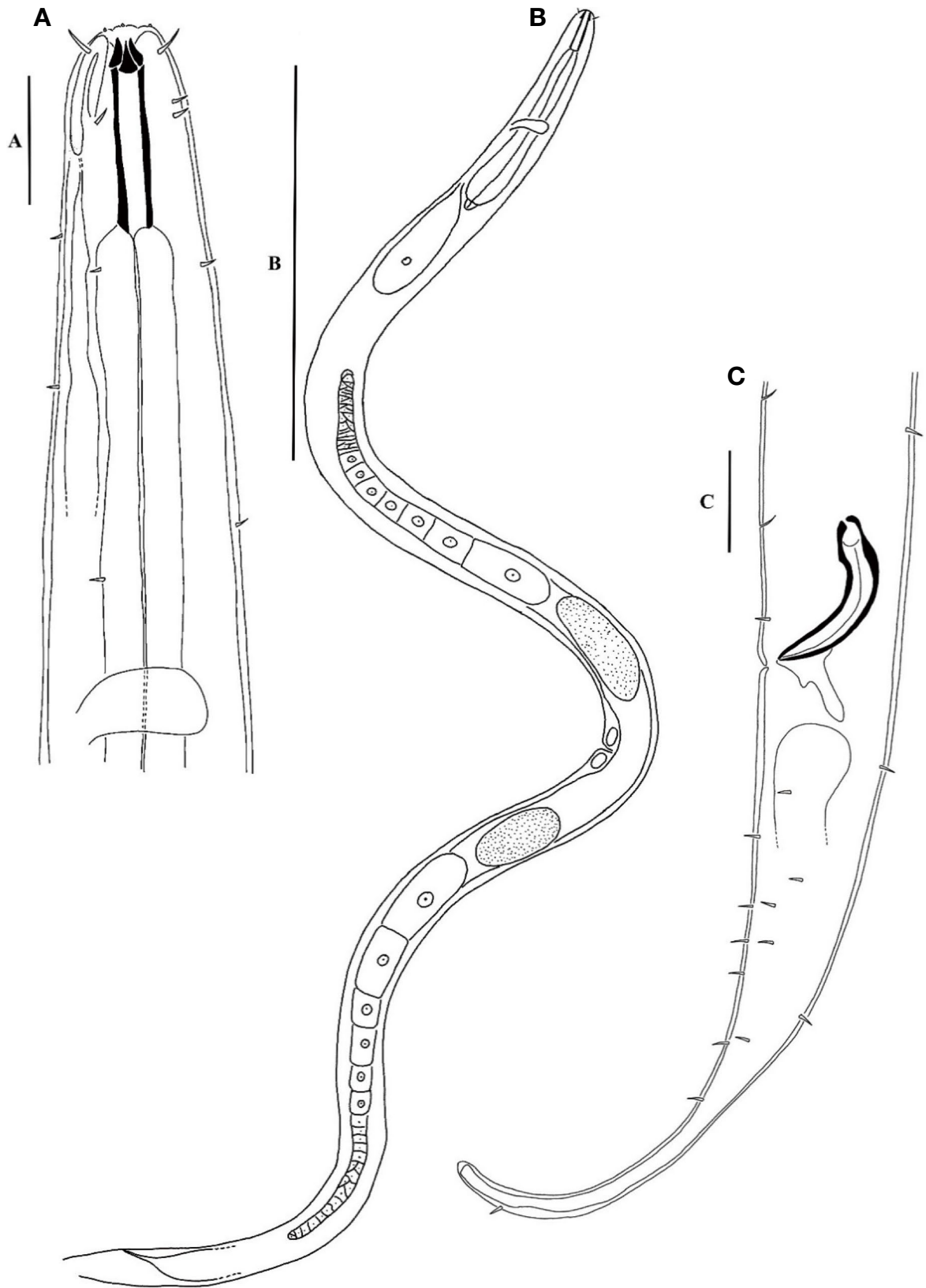


Fig. 2. *Parodontophora huoshanensis* Li & Guo, 2016, from the East Sea, Korea. A, Male head; B, Female head, pharynx, vulva, anus; C, Male copulatory apparatus and tail. Scale bars: 20 µm (A, C) and 200 µm (B).

Class Chromadorea Inglis, 1983
 Subclass Chromadoria Pearse, 1942
 Order Araeolaimida De Connick & Schuurmans Stek-
 hoven, 1933
 Family Axonolaimidae Filipjev, 1918
 Genus *Parodontophora* Timm, 1963

***Parodontophora huoshanensis* Li & Guo, 2016**
(Fig. 2, Table 2)

Locality. The specimens were collected from the subtidal region off the coast of Gijang in the southern part of the East Sea, Korea (35°16'0.0"N, 129°16'50.0"E) at a depth of 16 m, within clay sediment.

Material. Five males (MABIK NA00158032, MABIK NA00158075–MABIK NA00158078) and three females

(MABIK NA00158079–MABIK NA00158080) were collected by Jung-Ho Hong off the coast of Gijang on 30 April 2023, from Research Vessel Haeyanghwnangkyung 3.

Measurements. See Table 2 for detailed measurements and morphometric ratios.

Description. Males (Fig. 2, Table 2). Body cylindrical, gradually tapering towards the tail end, about 1216–1345 µm long and 40–44 µm wide at maximum body diameter. Cuticle with faint longitudinal striation. Lip region rounded with six outer labial papillae. Cephalic setae 3–4 µm long located 4 µm from anterior end. Opisthocephalic setae 2–3 µm long, arranged as two subdorsal groups of two longitudinally arranged setae and two single subventral setae, i.e. (2D-1V)2. Somatic setae scattered, about 2 µm long. Buccal cavity (25–29 µm long, 4–5 µm wide) in

Table 2. Morphometrics of *Parodontophora huoshanensis* Li & Guo, 2016, from East Sea, Korea and *P. huoshanensis* Li & Guo, 2016, from East China Sea.

Characters	<i>P. huoshanensis</i> from the East Sea, Korea		<i>P. huoshanensis</i> ^a from the East China Sea
	♂; n = 5	♀; n = 2	♂; n = 2, ♀; n = 2
L	1216–1345	1190–1248	1235–1408
mbd	40–44	38–40	42–72
hd	13–14	13–14	11–15
cep	3–4	3–3	3–4
opcs	2–3	2–2	2–2
BL	25–29	26–27	26–29
bcd	18–21	20–22	17–24
AL	2–2	2–3	3–3
amp cbd	18–21	18–21	17–24
ampdb	12–13	12–13	13–13
ampvb	18–21	20–22	20–24
NL	72–106	70–85	95–102
N cbd	27–30	30–32	28–43
PL	142–162	130–140	150–164
P cbd	30–33	30–32	33–55
RGL	70–81	52–64	56–91
V%	n/a	48.9–49.7	49.5–50.1
abd	26–30	23–24	25–34
spia	32–35	n/a	34–35
s	1.1–1.3	n/a	1.1–1.3
gub	12–14	n/a	11–13
TL	125–148	120–133	130–146
a	30–32	31–31	18–34
b	8.3–8.9	8.9–9.2	8.1–9.3
c	9.0–9.6	9.4–9.9	9.1–10.6
c'	4.7–5.4	5.2–5.5	4.3–5.7

All measurements are in µm unless otherwise specified, with the exception of a, b, c, c', s. n/a indicates not applicable.

Literature sources: ^aLi & Guo, 2016.

two parts, anterior part with six teeth and the cylindrical posterior part with conspicuous sclerotized parallel walls. Open-looped shape amphids situated at 2 µm from anterior body apex, shorter dorsal branch (12–13 µm) about half as long as the ventral branch (18–21 µm). Amphid opens to dorsal branch. Posterior end of amphid near half the base of stoma. Pharynx starting at base of stoma, muscular, and gradually broadens to base. Cardia small, rounded-conoid. Nerve ring at 53–69% of pharynx length. Renette cell slightly behind the base of pharynx, long oval shape, 42–53% of pharynx length. Excretory pore indistinct near cephalic setae at anterior part of buccal cavity. Tail length 125–148 µm, conical anteriorly and cylindrical posteriorly, pointed terminal end without terminal setae. Three caudal glands open to spinneret. Testes outstretched, opposed. Anterior testis to right and posterior testis to left of intestine. Vas deferens well-developed. Spicules paired, arched with double-cephalated proximal end, 32–35 µm long along arch. Gubernaculum with dorsal-caudally directed apophysis 12–14 µm long, with middle of its ventral side thickened. 5–6 small tubular preloacal supplements present.

Females (Fig. 2, Table 2). Similar to male. Reproductive system amphidelphic, ovaries outstretched. Vulva situated slightly anterior to mid-body at 48.9–49.7% of body of length.

Remarks. *Parodontophora huoshanensis* Li & Guo, 2016 is characterized by comparatively short cephalic setae, the posterior end of the amphid positioned far from the base of the buccal cavity, opisthocephalic setae arrayed as (2D-1V)2, the excretory pore located near the cephalic setae at the anterior part of the buccal cavity, Renette cell occupying 34–60% of the pharynx length, and the presence of six small tubular preloacal supplements. Our specimens from the East Sea, Korea, closely resemble the original description by Li & Guo in 2016. However, they exhibit slight differences, being smaller in both body width (40–44 µm compared to the original description of 42–72 µm) and body length (1190–1345 µm compared to the original description of 1235–1408 µm). We interpret this variation as intraspecific diversity.

Class Chromadorea Inglis, 1983
 Subclass Chromadoria Pearse, 1942
 Order Monhysterida De Connick & Schuurmans Stekhoven, 1933
 Family Linhomoeidae Filipjev, 1922
 Genus *Terschellingia* de Man, 1888

***Terschellingia longicaudata* de Man, 1907**
(Fig. 3, Table 3)

Locality. The specimens were collected from the subtidal middle part of the East Sea, Korea, specifically along the

coast of Yangyang (38°4′50.2″N, 128°42′32.9″E). The collection site was located at a depth of 68 m in clay sediment.

Material. Four males (MABIK NA00157786, MABIK NA00158070–MABIK NA00158072) and two females (MABIK NA00158073–MABIK NA00158074) were collected by Seunghan Lee on the coast of Yangyang on 6 May 2022, aboard the Research Vessel Haeyanghwnan-gkyung 3.

Measurements. See Table 3 for detailed measurements and morphometric ratios.

Description. Males (Fig. 3, Table 3). Body slender, long and fusiform with long conical-cylindrical tail. Cuticle smooth and finely striated. Head rounded slightly truncate at anterior end. Six inner, labial papillae. Six cephalic setae 4–5 µm long. Four subcephalic setae 4–5 µm long, forming a circle at amphids level (12–13 µm from anterior end). Amphidial fovea circular and sclerotized, 7.5–8.5 µm in diameter (about 0.5 cbd), situated at 4 µm from anterior end. Small buccal cavity shallow cup-shaped and unsclerotized. Pharynx cylindrical with an elongated and slightly expanded posterior portion, muscular, posteriorly forming a well-pronounced bulb (24–25 µm wide). Cardia conical (21–24 µm long), projecting into intestine. Nerve ring 69–85 µm behind anterior end or 43% of pharyngeal length. Ventral gland located at junction of pharynx and intestine. Excretory pore just located below nerve ring, 72–88 µm from anterior end. Tail elongates, about 12.2–16.6 a.b.d., conical with a long filiform portion constituting about over 80% of total tail length (255–402 µm long). Testes outstretched; reflexed posterior are similar in length. Both testis to left of intestine. Long and thin vas deferens well-developed. Spicules paired, slender and arcuate, 1.4–1.5 a.b.d. long as curve, cephalate and ventrally bent proximally. Gubernaculum with a pair of 10–12 µm dorsal caudal apophysis. One preloacal seta, 2–3 µm long. Preloacal supplement absent.

Females (Fig. 3, Table 3). Similar to male. Reproductive system didelphic, with two outstretched ovaries. Vulva with slightly raised lips, situated at pre-median of body (41.4–43.2% of body length).

Remarks. *Terschellingia longicaudata* de Man, 1907 is characterized by the absence of teeth in the buccal cavity, the amphidial fovea positioned near the anterior end, setiform cephalic setae, subcephalic setae at the level of the amphids, the formation of a well-pronounced bulb in the pharynx, a long cylindrical portion of the tail (over 50%), spicule ratio (s) lower than 1.7, gubernaculum with apophysis, and the presence of a posterior ovary (Armenteros *et al.*, 2009). The specimens from the East Sea, Korea, generally conform to the original description by de Man (1907), except for the ‘de Man ratio a,’ which was higher in the type specimens (a = 43–46 vs. 20–28). Additionally, there are slight differences in body width (30–38

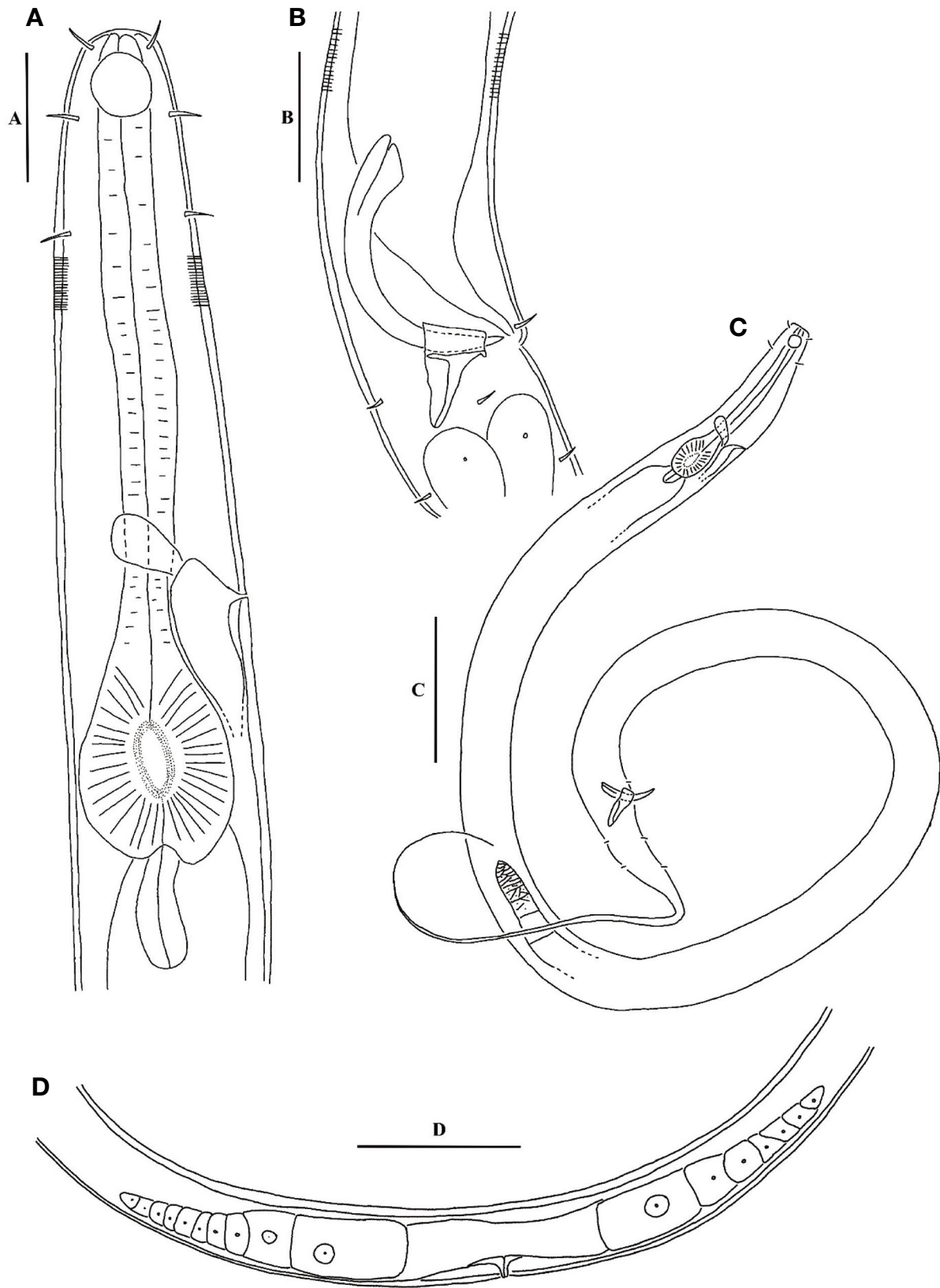


Fig. 3. *Terschellingia longicaudata* de Man, 1907, from the East Sea, Korea. A, Male pharynx; B, Male copulatory apparatus; C, Male habitus; D, female vulva. Scale bars: 20 μ m (A, B) and 100 μ m (C, D).

Table 3. Morphometrics of *Terschellingia longicaudata* de Man, 1907, from East Sea, Korea; *T. longicaudata* de Man, 1907, from Cienfuegos Bay, Cuba; *T. longicaudata* de Man, 1907, from Norwegian Sea.

Characters	<i>T. longicaudata</i> from the East Sea, Korea		<i>T. longicaudata</i> ^a from Cienfuegos Bay, Cuba	<i>T. longicaudata</i> ^b from the Norwegian Sea
	♂; n=4	♀; n=2	♂; n=10, ♀; n=5	♂; n=3, ♀; n=4
L	1278–1531	1487–1617	1367–2438	1063–1438
mbd	30–33	36–38	30–94	40–62
hd	12–13	13–14	n/a	14–19
cep	4–5	5–5	2–8	4–4
AL	4–4	4–4	2–8	5–6
amp	7.5–8.5	9–10	5–10	9–10
amp cbd	15–16	16–17	10–30	19–22
EPL	72–88	82–92	n/a	98 (1)
PL	115–130	108–112	92–212	155 (1)
P cbd	29–30	31–31	n/a	41–56
V%	n/a	41.4–43.2	38–47	45.0–48.3
abd	26–28	25–26	27–56	44–55
spia	36–43	n/a	38–113	31–37
s	1.4–1.5	n/a	1.4–1.9	0.9–1.0
gub	10–12	n/a	5–21	12–15
TL	318–465	408–473	313–688	235–438
cylin	255–401	335–405	n/a	184–377
cylin%	80.2–86.2	82.1–85.6	n/a	78.3–86.1
a	43–46	41–43	26–45	20–28
b	10.7–11.8	13.8–14.4	11.5–14.7	10.0–15.7
c	3.3–4.1	3.4–3.6	2.2–7.8	2.9–4.4
c'	12.2–16.6	16.3–18.2	5.5–23.1	7.0–10.1

All measurements are in μm unless otherwise specified, with the exception of a, b, c, c', s. n/a indicates not applicable. Data presented is measurement range unless n = 1. Unless otherwise stated, number of replicates indicates in brackets. Literature sources: ^aArmenteros *et al.*, 2009; ^bde Man, 1907.

μm vs. 40–62 μm) and spicule length ratio (s = 1.4–1.5 vs. 0.9–1.0). We interpret this variation as intraspecific diversity.

Class Chromadorea Inglis, 1983
 Subclass Chromadoria Pearse, 1942
 Order Araeolaimida De Connick & Schuurmans Stekhoven, 1933
 Family Comesomatidae Filipjev, 1918
 Genus *Vasostoma* Wieser, 1954

***Vasostoma brevispicula* Huang & Wu, 2011**
(Fig. 4, Table 4)

Locality. The specimens were collected from the subtidal southern part of the East Sea, Korea, along the coast of Gijang (35°16'0.0"N, 129°16'50.0"E). The collection site was at a depth of 16 m in clay sediment.

Material. Four males (MABIK NA00158040, MABIK NA00158081–MABIK NA00158083) and two females

(MABIK NA00158084–MABIK NA00158085) were collected by Jung-Ho Hong on the coast of Gijang on 30 April 2023, aboard the Research Vessel Haeyanghwnan-gkyung 3.

Measurements. See Table 4 for detailed measurements and morphometric ratios.

Description. Males (Fig. 4, Table 4). Body cylindrical, slender, gradually tapering toward both extremities. Cuticle with transverse rows of dots, no lateral differentiation. Somatic setae (about 2 μm long) arranged randomly along the whole body. Tail conico-cylindrical. Three crowns of anterior sensilla: six inner labial papillae, six outer labial papillae and four short cephalic setae (3 μm long). Amphidial fovea (8–9 μm wide) large, 7–9 μm behind anterior end, situated behind cephalic setae, circular spiral form. Fovea spiral coiled ventrally, about 2.5 turns. Buccal cavity composed with small cup-shaped anterior portion (about 2 μm deep) and sclerotized cylindrical posterior portion (11–12 μm deep) with three teeth. Pharynx long (188–202 μm) and slender, cylindrical with long pyriform

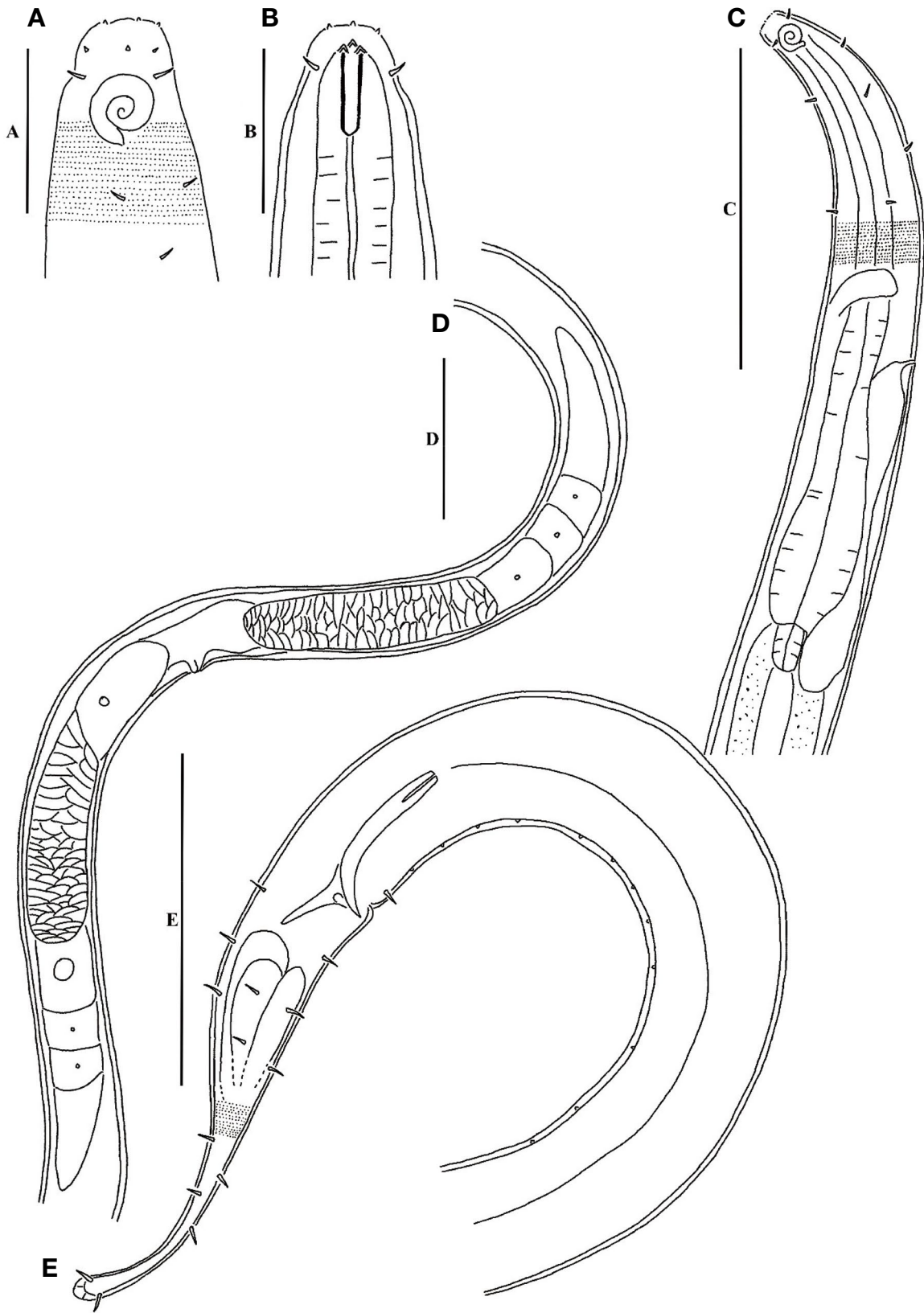


Fig. 4. *Vasostoma brevispicula* Huang & Wu, 2011, from the East Sea, Korea. A, Male head, showing amphideal fovea and cuticular ornamentation at the head region; B, Male head; C, Male Pharynx; D, Female vulva; E, Male precloacal and anal region. Scale bars: 20 μm (A, B) and 100 μm (C-E).

Table 4. Morphometrics of *Vasostoma brevispicula* Huang & Wu, 2011, from East Sea, Korea and *V. brevispicula* Huang & Wu, 2011, from Yellow Sea, China.

Characters	<i>V. brevispicula</i> from the East Sea, Korea		<i>V. brevispicula</i> ^a from the Yellow Sea, China
	♂; n=4	♀; n=2	♂; n=2, ♀; n=2
L	2009–2235	2275–2425	2119–2906
mbd	41–44	46–48	37–58
hd	12–13	13–13	13–13.5
cep	3–3	3–3	3–4
BL	13–14	14–14	13–14
amp	8–9	9–9	9–10
NL	86–94	92–98	92–102
N cbd	30–33	36–36	31–40
EPL	115–125	118–120	108–130
PL	188–202	204–215	200–222
P cbd	36–39	40–42	37–53
V%	n/a	43–46	43–47
abd	35–38	34–35	35–46
spia	51–55	n/a	52–57
s	1.4–1.5	n/a	1.4–1.6
gub	22–25	n/a	22–26
TL	144–152	152–159	133–197
a	49–51	50–51	50–59
b	10.7–11.2	11.2–11.3	10.6–13.2
c	14.1–15.3	15.0–15.3	14.4–16.9
c'	3.9–4.2	4.5–4.5	3.8–4.6

All measurements are in μm unless otherwise specified, with the exception of a, b, c, c', s. n/a indicates not applicable.
Literature sources: ^aHuang & Wu, 2011.

bulb (20–25 μm , cbd 30–33 μm). Nerve ring located at 86–94 μm (44.6–47.2%) of pharyngeal length from anterior end. Ventral gland pore situated at 115–125 μm of pharyngeal length from anterior end. Cardia round, small (12–14 μm), surrounded with intestinal tissue. Reproductive system diorchic, testes outstretched. Spicules paired, equal and arcuate with a central lamella, 51–55 μm long as arc (1.4–1.5 a.b.d). Gubernaculum with long straight dorsocaudally directed apophyses, 22–25 μm long. 9–12 minute mid-ventral supplementary papillae observed in precloacal region. Short precloacal setae (3 μm long) just anterior to cloaca. Tail consisted proximal conical and distal cylindrical part (45–58 μm). Tail 3.9–4.2 a.b.d long with three short terminal setae (about 3–5 μm long), three caudal glands, and prominent spinneret. Other tail setae (about 4–5 μm) arranged in approximately four dorso- and ventrolateral longitudinal rows.

Females (Fig. 4, Table 4). Similar to male. Vulva at 43.1–46.2% of body of length. Didelphic, outstretched ovaries.

Remarks. *Vasostoma brevispicula* Huang & Wu, 2011 is

characterized by its thin and long body, a tubular buccal cavity with three small teeth, a long pyriform oesophageal bulb and curved spicules with a central lamella (Huang and Wu, 2011). The specimens from the East Sea, Korea, generally conform to the original description of *Vasostoma brevispicula* by Huang & Wu (2011), with slight differences in body width (41–48 μm vs. 37–56 μm) and body length (2009–2425 μm vs. 2119–2906 μm). We interpret this variation as intraspecific diversity.

CONFLICTS OF INTEREST

The author of this paper has no affiliation with any interests and is solely responsible for the paper.

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