

**TWO NEW SPECIES OF THE GENUS *PTYCHOLAIMELLUS* COBB, 1920
(NEMATODA: CHROMADORIDAE) FROM COASTAL ZONE
OF NORTH VIETNAM SEA**

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ABSTRACT: Two new marine nematode species of the family Chromadoridae collected from coastal zone of North Vietnam sea were described and illustrated, namely *Ptycholaimellus brevisetosus* sp. n. and *Ptycholaimellus areniculus* sp. n. The new species *P. brevisetosus* sp. n. resembles to *P. pondispicularis* (Hopper, 1961) but differs from it by the longer body, absence of somatic and cervical setae, more wide labial region, longer cephalic setae and longer spicules, and *P. areniculus* sp. n. resembles to *P. macrodentatus* (Timm, 1961) but differs from it by the longer body, relatively shorter cephalic setae, absence of knob-like swellings at base of dorsal tooth in stoma and presence of small piece in spicular apparatus of males.

Keywords: Chromadoridae, *Ptycholaimellus*, free-living marine nematodes, new species, North Vietnam coastal sea.

INTRODUCTION

The fauna of marine nematodes has been studied recently in Vietnam. At present, this investigating field on nematode biodiversity is strongly improved in connection with building up basic biomonitoring data for water quality assessment in watershed and wetland ecosystems along the country's coastline. This work is revealed as a part of the project funded by Vietnam Academy of Science and Technology (VAST) for study of biodiversity and free-living nematode fauna of the coast of Vietnam. The nematode samples were collected in March 2010 and November 2012. In this paper two new species of the genus *Ptycholaimellus* Cobb, 1920 (Chromadoridae), *Ptycholaimellus brevisetosus* sp. n. and *Ptycholaimellus areniculus* sp. n., were described and illustrated.

MATERIALS AND METHODS

Sample collecting: samples were scraped by Ponnar grab. Then top 10 cm sediment was collected by a plastic tube corer (10 cm³) with three replicates from each site and fixed with 10% hot formalin solution. Additionally, samples for granulometric analysis were also

taken with a plastic tube.

Sample processing: after washing samples onto a 40 μ m, nematodes were extracted with Ludox TM-50 (d=1.18). The extraction was repeated three times (Heip *et al.*, 1985). Maximum of 200 nematodes were randomly picked, transferred in anhydrous glycerol and mounted on slides for identification and counting.

Abbreviations used in the text L = total body length (μ m); a = body length divided by maximum body width; b = body length divided by pharyngeal length; c = body length divided by tail length; c' = tail length divided by cloacal or anal body diameter; V (%) = relation of distance from anterior body end to vulva for body length in percentage.

DESCRIPTION

Order Chromadorida Chitwood, 1933

Family Chromadoridae Filipjev, 1929

Genus *Ptycholaimellus* Cobb, 1920

1. *Ptycholaimellus brevisetosus* sp. n. (Fig.1, Table 1)

Male: body slender, medium size. Cuticle annulated, thin. Thickness cuticle at middle of

body about 1.0 μm . Lateral fields 6-7 μm wide, begin at level of stoma and extend to tail middle. In the beginning lateral fields have no transverse crosspieces which appear at level of the middle of oesophagus length. Somatic setae absent. Lips well developed, isolated from other body. Inner labial sensillae and outer labial sensillae badly visible, in shape of small papillae. Cephalic sensillae in shape of thin setae and being 55-60%

of labial region width. Cheilostoma armed by 12 ribs. In esophastoma one big dorsal tooth, apical end which hook-like bend and two small subventral denticles. Knob-like swellings at base of dorsal tooth absent. Walls of anterior portion of esophastoma strongly cuticularized and at its outer dorsal side have rather long apophysis. Amphidial fovea in shape of transverse split and situated at lips bases.

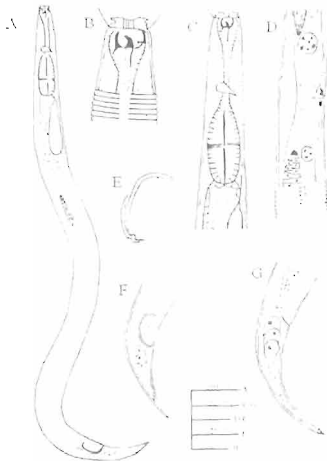


Figure 1. *Prycholaimellus brevisetosus* sp. n.

A. Entire male; B. Head region; C. Anterior end of body; D. Vulva region; E. Spicular apparatus; F. Male tail; G. Female tail.

Oesophagus muscular with big basal bulb, divided at two portions. Basal bulb being 39-45% of oesophagus length. Cardia not visible. Renette baggy-shaped, large. Its length being 50-65% of oesophagus length. Testis one, anterior, situated to left side of intestine. Spicules paired, strongly bent ventrally, 1.4-1.6

times as long as cloacal body diameter. Gubernaculum paired, only slightly bent. At apical end of each gubernaculum are two small lateral apophysis, covered spicules and also small hook-like apophysis. Supplements absent. Tail elongate-conical, gradually narrowing. Caudal setae absent. Caudal glands and

spinneret well developed. Spinneret finger-like, 10-12 μm long. *Females*: general appearance similar to that of male. Structure of cuticle and anterior portion of body similar to males. Gonads didelphic, amphidelphic; ovaries antiodromous, with long bends. Anterior ovary situated to right side of intestine, posterior ovary situated to left side of intestine. Vulva of

transverse slit, equatorial, its lips not cuticularized and not protruding outside the body counter. Vulvar glands comparatively small. Both uterus spacious. Spermathecas oval, 20-31 μm diameter. Tail elongate-conical, gradually narrowing. Caudal glands and spinneret well developed.

Table 1. Measurements of *Ptycholaimellus brevisetosus* sp. n. (all measurements in μm , except ratio)

Characteristics	Holotype ♂	Paratypes			
		4 ♂♂		6 ♀♀	
		range	mean	range	mean
L	1103	1049-1202	1113	1205-1518	1323
a	18	17-26	21	18-26	22
b	6.0	5.4-6.2	5.8	5.7-6.6	6.2
c	10.2	10.0-11.2	10.6	8.9-12.7	10.5
c'	2.8	2.7-4.2	3.2	3.5-5.1	4.3
V %	—	—	—	45.7-52.5	49.2
Labial region width	26	26-28	27	27-29	28
Cephalic setae length	15	15-16	15	15-16	15
Oesophagus length	185	176-221	195	187-252	212
Oesophageal bulb length	83	72-90	83	86-112	94
Posterior end of oesophagus to vulva	—	—	—	353-536	439
Posterior end of oesophagus to cloaca	810	738-873	811	—	—
Renette length	92	90-113	104	89-117	105
Vulva to anus	—	—	—	500-630	542
Tail length	108	98-115	107	95-180	130
Spicule length	53	52-56	53	—	—
Gubernaculum length	32	32-34	33	—	—

Type locality and habitat littoral of North Vietnam sea, latitude 21°13.476', longitude 107°22.467'. Depth of waters 1.5-2.0 m, sand, salinity 24‰.

Type material: holotype male, slide number 100/29 and one female paratypes, deposited at the Nematode Collection, Center of Parasitology, Institute of Ecology and Evolution, RAS, Moscow, Russia. Paratypes: 4 males and 5 females deposited at the Nematode Collection, Institute of Ecology and Biological Resources, VAST, Hanoi, Vietnam.

Differential diagnosis: the new species resembles to *Ptycholaimellus pandispiculatus* (Hopper, 1961) Wieser & Hopper, 1967, which was found at coastal of Mexico (Hopper, 1961)

by structure of spicular apparatus, but differs from it by the longer body (in *P. pandispiculatus* L = 970-1140 μm vs. L = 1049-1598 in new species), absence of somatic and cervical setae, more wide labial region (in *P. pandispiculatus* labial region 15 μm wide vs. 26-32 μm in new species, longer cephalic setae (in *P. pandispiculatus* cephalic setae 6-7 μm long vs. 15-16 μm in new species) and longer spicules (in *P. pandispiculatus* spicules 40 μm long vs. 52-56 μm in new species).

Etymology: the species name means "long setae", "with long setae".

2. *Ptycholaimellus areniculus* sp. n. (Fig. 2, Table 2)

Male: body slender, medium size. Cuticle

annulated, thin. Thickness cuticle at middle of body 0.7-1.0 μm . Lateral fields 4-5 μm wide, begin at level of stoma and extend to tail middle. In the beginning lateral fields have no transverse crosspieces which appear at level of the middle of oesophagus length. Somatic setae absent. Lips well developed, isolated from other body. Inner labial sensillae and outer labial sensillae badly visible, in shape of small papillae. Cephalic sensillae in shape of thin setae and being 30-33% of labial region width. Cheilostoma armed by 12 ribs. In esophastoma

one big dorsal tooth, apical end which hook-like bend, and two small subventral denticles. Knob-like swellings at base of dorsal tooth absent. Walls of anterior portion of esophastoma strongly cuticularized and at its outer dorsal side have long apophysis. Amphidial fovea in shape of transverse split and situated at lip bases. Oesophagus muscular with big basal bulb, divided at two portions. Basal bulb being 36-44% of total oesophagus length. Cardia not visible. Renette baggy-shaped, large. Its length being 53-65% of oesophagus length.

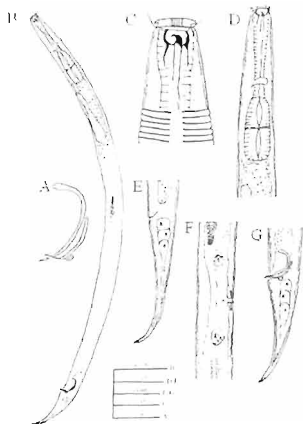


Figure 2. *Ptycholaimellus areniculus* sp. n.

A. Spicular apparatus; B. Entire male; C. Head region; D. Anterior end of body; E. Female tail; F. Vulva region; G. Male tail.

Testis one, anterior, situated to left side of intestine. Spicules paired, strongly bent ventrally, 1.5-1.7 times as long as cloacal body diameter. Gubernaculum paired, only slightly bent. There is also small, oval, sclerotized piece. Precloacal supplements absent. Tail elongate-conical, gradually narrowing. Caudal glands and

spinneret well developed. Spinneret finger-like, 5-6 μm long.

Female: general appearance similar to that of males. Structure of cuticle and anterior portion of body similar to males. Gonads didelphic, amphidelphic; ovaries antidromous with long bends. Anterior ovary situated to right

side of intestine, posterior ovary situated to left side of intestine. Vulva a transverse slit, equatorial, its lips not cuticularized and not protruding outside the body counter. Vulvar glands comparatively small. Both uterus spacious. Spermathecas oval, 15-21 μm diameter. Tail elongate-conical, gradually narrowing. Caudal glands and spinneret well developed.

Type locality and habitat littoral of North Vietnam sea, latitude 21°13.476', longitude 107°22.467'. Depth of waters 1-2 m, sediment of sand, salinity 24‰.

Type material holotype male on slide number 100/31 deposited at the Nematode Collection, Center of Parasitology, Institute of Ecology and Evolution, RAS, Moscow.

Paratypes 9 ♂♂ and 9 ♀♀ deposited at the Nematode Collection, Institute of Ecology and Biological Resources, VAST, Hanoi, Vietnam.

Differential diagnosis: the new species resembles to *Ptycholaimellus macrodentatus* (Timm, 1961) Wieser & Hopper, 1967, but differs from it by the longer body (in *P. macrodentatus* ♂♂ L = 621-670 μm , ♀♀ 796-823 μm vs. ♂♂ L = 715-882 ♀♀ μm , ♀♀ L = 863-1069 μm in new species), relatively shorter of cephalic setae (in *P. macrodentatus* cephalic setae are equal to width of labial region vs. length of cephalic setae being 30-33 % of labial region width in new species), absence of knob-like swellings at base of dorsal tooth and presence of small oval piece in spicular apparatus of males (Timm, 1961).

Table 2 Measurements of *Ptycholaimellus areniculus* sp.n. (all measurements in μm , except ratio)

Characteristics	Holotype ♂	Paratypes			
		9 ♂♂		9 ♀♀	
		range	mean	range	mean
L	740	715-882	806	863-1069	958
a	23	20-24	22	18-27	24
b	5.5	4.9-5.8	5.4	5.2-6.5	5.7
c	10.2	9.4-13.2	10.6	8.8-11.9	10.1
c'	3.2	3.0-3.7	3.4	3.6-5.4	4.7
V %	-	-	-	46.2-50.1	48.6
Labial region width	16	15-18	17	16-19	18
Cephalic setae length	6.0	6.0-7.0	6.5	6.0-7.5	6.5
Oesophagus length	155	135-162	149	158-176	168
Oesophageal bulb length	47	47-68	62	60-81	73
Posterior end of oesophagus to vulva	-	-	-	248-338	297
Posterior end of oesophagus to cloaca	533	533-648	581	-	-
Renette length	92	75-120	89	79-113	98
Vulva to anus	-	-	-	340-461	397
Tail length	72	72-88	76	86-113	96
Spicule length	36	36-39	38	-	-
Gubernaculum length	23	20-23	22	-	-

Remarks: *Ptycholaimellus macrodentatus* (Timm, 1961) was found and described from Kenyan coast of Indian Ocean by Muthumbi and Vincx (1998). However, vermes of this nematode population differs from vermes of types nematode population from Bengal Bay by the longer body (621-670 μm in *P.*

macrodentatus), relatively shorter of cephalic setae (8m in *P. macrodentatus*), absence of knob-like swellings at the base of dorsal tooth and presence of small, oval piece in spicular apparatus of male. With these differentiation we proposed the Kenyan population of "P. macrodentatus" is belong to new species:

Ptycholaimellus areniculus sp. n.

Etymology: the species name means "sandy", "from sand".

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REFERENCES

1. Dashenko, Belogurov, 1984. Morphological characteristics of the new species *Ptycholaimellus adocius* sp. n (Nematoda, Chromadorida) from Pocet Bay, Japanese sea. <http://intramar.ugent.be/nemysl/>.
2. Eskin R. A., Hopper B. E., 1985. Population dynamics and description of *Ptycholaimellus hibermus* n. sp. (Nematode: Chromadoridae). *Journal of Nematology*, 17(1): 38-45.
3. Hopper B. E., 1961: *Canadian Journal of Zoology*, 39: 359-365.
4. Preben Jensen and Stefen Nehring, 1992. Review of *Ptycholaimellus* Cobb, 1913 (Nematoda: Chromadoridae), with description of three species. *Zoologica Scripta*, 21(3): 239-245.
5. Muthumbi A. W., Vincx M., 1998. *Hydrobiologia*, 364: 119-153.
6. Timm R. H., 1961. *Proceedings of the Pakistan Academy of Science*, 1(1): 1-88.
7. Wieser W., Hopper B. E., 1967. Marine nematodes of the east coast of North America. I. *Florida Bull. Mus. comp. Zool. Harw*, 135(5): 239-344.
8. WoRMS, 2011. *Ptycholaimellus* Cobb, 1920. In: Deprez, T. et al., 2005.
9. NeMys. World Wide Web electronic publication. World Register of Marine Species <http://www.marinespecies.org/aphia>.

HAI LOÀI TUYẾN TRÙNG BIỂN MỚI THUỘC GIỐNG *PTYCHOLAIMELLUS* COBB, 1920 (NEMATODA: CHROMADORIDAE) Ở VÙNG BIỂN VEN BỜ MIỀN BẮC VIỆT NAM

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TÓM TẮT

Mô tả và công bố hai loài mới tuyến trùng biển sống tự do *Ptycholaimellus brevisetosus* sp. n. và *Ptycholaimellus areniculus* sp. n. thuộc họ Chromadoridae ở vùng nước ven bờ các tỉnh phía Bắc Việt Nam. Về hình thái, loài tuyến trùng biển mới *Ptycholaimellus brevisetosus* sp. n. tương đối giống với loài *Ptycholaimellus pandispiculatus* (Hopper, 1961) nhưng có đặc điểm khác ở chỗ cơ thể dài hơn, không có các lông somatic trên cơ thể và không có lông trên vùng cổ, đường kính vùng mới rộng hơn, lông đầu dài hơn và gai sinh dục cũng dài hơn.

Loài tuyến trùng biển mới *Ptycholaimellus areniculus* sp. n. về hình thái tương đối giống loài *Ptycholaimellus macrodentatus* (Timm, 1961) nhưng có đặc điểm khác ở chỗ cơ thể dài hơn, lông đầu ngắn, trong xoang miệng ở phần gốc răng lưng không có đoạn phình lên giống kiểu dạng gốc kim hút và có sự hiện diện của miếng nhỏ dài trên bộ phận gai sinh dục.

Từ khóa: Chromadoridae, *Ptycholaimel*, loài mới, tuyến trùng biển, Bắc Việt Nam.

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