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# A review of the genus *Amphimonhystera* Allgén, 1929 (Monhysterida: Xyalidae, Marine Freeliving Nematodes) with description of three new species

ALEXEI V. TCHESUNOV[1] & VADIM O. MOKIEVSKY[2]

[1]*Department of Invertebrate Zoology, Faculty of Biology, Moscow State University, Moscow, 119992, Russia (AVTchesunov@yandex.ru)*

[2]*P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Nakhimovsky prosp., 36, Moscow, 117851, Russia (vadim@ocean.ru)*

## Abstract

Four of the six known *Amphimonhystera* species are either redescribed or described including, *A. galea* Fadeeva, 1984, *A. marisalbi* sp. n., *A. molloyensis* sp. n. and *A. pallida* sp. n. (the two former species from the White Sea, Northern Russia and the two latter species from the Arctic deep sea). Generic diagnosis is emended and a pictorial key for identification of *Amphimonhystera* species is constructed. Characters of *Amphimonhystera* and some problems with Xyalidae taxonomy are discussed. Generotype *A. anechma* differs significantly from the other five *Amphimonhystera* species by having a tail tip devoid of terminal setae. *A. marisalbi* sp. n. is most similar to *A. galea* in general appearance and structural characters but differs from the latter by very low inner labial sensilla, lesser number of setae in the cephalic crown as well as by shorter setae of the cephalic crown and tail terminal setae. *A. molloyensis* sp. n. is distinctly separated from both *A. galea* and *A. pallida* sp. n. by very short setae of the cephalic circle and by proximal position of the amphids. *A. pallida* sp. n. differs from the more similar *A. molloyensis* sp. n. by a smaller and less elongate amphid and a longer distance from the anterior end to the amphid. The differences between *A. pallida* sp. n. and *A. galea* are shorter setae of the cephalic circle and a longer distance from the anterior end to the amphid.

**Key words**: *Amphimonhystera*, Arctic Ocean, deep-sea nematodes, marine free-living nematodes, Monhysterida, Nematoda, taxonomy, Xyalidae, White Sea

## Introduction

In a survey of marine fauna of Ireland, Southern (1914) described a peculiar monhysterid nematode species under the name *Monohystera anechma*. This species is distinguished by

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having a huge longitudinal-shaped oval amphids and brownish color of the body. Allgén (1929) erected the new genus *Amphimonhystera* for *M. anechma* Riemann (1967) reviewed the genus *Amphimonhystera* and added a second species *A. helgolandica* Riemann, 1967 to the genus. Lorenzen (1972) described a new species of *Amphimonhystera*, *A. subtilis* Lorenzen, 1972. However subsequently, he found that the former two species disagreed with the type species *A. anechma* in their colourless cuticle, conical tail without terminal setae and in having a glandular posterior widening of the esophagus (Lorenzen, 1977) and consequently established the genus *Ammotheristus* Lorenzen, 1977 accomodating both *A. helgolandicus* and *A. subtilis*.

Fadeeva (1984) and Guo & Warwick (2001) described two more species, *Amphimonhystera galea* and *A. circula*, respectively. Recently, we have found two new *Amphimonhystera* species from Arctic deep sediment samples and two species including a new one from the White Sea, Northern Russia.

Here, we present descriptions of three new species of *Amphimonhystera* as well as a redescription of *A. galea* recorded for the first time in the White Sea. Also we have emended the generic diagnosis and have constructed an identification key.

## Materials and methods

Shallow-water sediment samples containing *A. galea* were collected from the White Sea by SCUBA divers. Samples were initially fixed on board ship with a 4% formaldehyde/ filtered sea water solution and after a few days decanted through a sieve of 70 µm mesh size. The White Sea deep sediment samples were collected using a minicorer during cruises of the research programme Central Basin Expedition (CBX) on RV KARTESH and RV PROFESSOR KUZNETSOV in July 1998 and in June and November 1999. In the Arctic deep sea, sediment samples were obtained with a Burnett multicorer during the ARK XVI and ARK XVII voyages of RV Polarstern in Summer 2000 and 2001. Samples were fixed with 4% neutral formaldehyde and then decanted through a set of five consequential sieves of 500, 250, 125, 63 and 32 µm mesh size. Before sieving, samples were stained in Rose Bengal solution. Nematodes from all samples were gradually proceeded to glycerin by a slow evaporation method and then mounted on permanent slides (Seinhorst, 1959).

Slides with type specimens of new species are deposited in the collection of the P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Nakhimovsky prosp., 36, Moscow, 117851, Russia.

### *Abbreviations*:

a—body length divided by maximum body diameter;

  

a.d.— anal body diameter;
am.l.—length of the amphidial fovea;
am.l./am.w.—length of amphidial fovea divided by its width;
am.w.—width of the amphidial fovea;
am.w. (%)—width of the amphidial fovea, as percentage of corresponding body diameter;
b—body length divided by esophageal length;
b.diam.am.—body diameter at the level of amphidial fovea;
b.diam.c.—body diameter at the level of cardia;
b.diam.c.s.—body diameter at the level of cephalic setae;
b.diam.n.r.—body diameter at the level of nerve ring;
c—body length divided by tail length;
ć—tail length in anal diameters;
calc.pict.—data calculated from published pictures;
c.b.d.— corresponding body diameter;
c.s.—length of outer labial setae and cephalic setae (in *Amphimonhystera*, they nearly equal in length);
c.s. (%)—length of outer labial setae and cephalic setae, as percentage of corresponding body diameter;
diam.midb.—midbody diameter;
dis.am.—distance from the cephalic apex to the anterior rim of the amphidial fovea;
dis.am./am.l. (%)—distance from the cephalic apex to the anterior rim of the amphidial fovea as percentage of length of the amphidial fovea;
dist. tail portion (%)—length of posterior cylindrical tail portion as percentage of the entire tail;
i.l.s.—length of inner labial sensilla;
L —body length;
spic.arc —length of spicule along the arch;
spic.chord —length of spicule along the chord;
st.l.—length of stoma;
st.w.—width of stoma;
termin.s.—length of terminal tail setae;
V (%)—distance of vulva from anterior end as percentage of body length

All measurements in $\mu$m unless otherwise stated.

## *Amphimonhystera* Allgén, 1929

### Emended diagnosis

**Xyalidae**. Cuticle annulated, often yellowish or slightly brownish in both live and glycerin fixed specimens. Subcuticular hypodermis also tends to be filled with brown

  

granules. Outer labial and cephalic setae of nearly equal length. In adults, additional setae may be inserted into the circle of outer labial and cephalic setae. Amphidial fovea very large, longitudinally oval, with distinct edging and spot (pore to *canalis amphidialis*) near in the center of the amphidial fovea. Buccal cavity very short and small. No renette cell. Male reproductive system diorchic. Anterior testis straight, to the left of the intestine; posterior testis reflexed, to the right of the intestine. Female reproductive system monodelphic-prodelphic. Anterior portion of the ovary situated to the left of the intestine while the ovary tends to be bent ventrally and then the posterior portion situated to the right side of the intestine. Spicules small, strongly bent, proximally cephalated and distally acute. Gubernaculum as a small structure parallel to distal part of spicules, uncertain or absent. Tail elongate conical, with weakly formed posterior cylindrical portion and very slightly inflated terminally. Terminal setae on the tail may be present or absent.

Type species *A. anechma* (Southern, 1914). Two other known species and three new species, all marine.

## List of *Amphimonhystera* species

1. *Amphimonhystera anechma* (Southern, 1914).
   *Literature and synonymy*: Southern, 1914: 13–14, pl. III, Figs 7A–F (*Monohystera a.*), Ireland; Allgén, 1928: 298–299 (*Monhystera a.*), west coast of Sweden. Gerlach, 1958: 81, Kiel Bay; Riemann, 1967: 218–222, Abb. 1–7, North Sea; Lorenzen, 1974: 313; North Sea and Lorenzen, 1977: 203–205, Abb. 2 a–f; North Sea. Own data: White Sea.
2. *Amphimonhystera circula* Guo et Warwick, 2001. Females not described.
   *Literature*: Guo & Warwick, 2001: 1579–1581, Fig. 3, Bohai Sea, China, depth 20.5–38.5 m, silt.
3. *Amphimonhystera galea* Fadeeva, 1984. Females not described.
   *Literature*: Fadeeva, 1984: 46–48, Figs 2В, 3Л, 3В, Japan Sea, now White Sea.
4. *Amphimonhystera marisalbi* sp. n. White Sea, this study.
5. *Amphimonhystera molloyensis* sp. n. Arctic Ocean, area between Greenland and Svalbard, deep sea, this study.
6. *Amphimonhystera pallida* sp. n. Arctic Ocean, area between Greenland and Svalbard, deep sea, this study.

## Discussion of the main morphological discriminating characters

Yellowish to brown pigmentation of the cuticle and hypodermis. This character was mentioned in the diagnoses of all hitherto known *Amphimonhystera* species. However, the degree of pigmentation exhibits inter- and intraspecific variability. Within the species *A. molloyensis*, one male specimen clearly has pigmentation of the preneural region while other specimens are colourless. While *A. anechma*, *A. galea* and *A. circula* are brownish,

  

*A. marisalbi* and *A. pallida* are rather pale. Generally, the anterior body is more densely coloured than the rest of body.

Amphidial fovea. *A. circula* differs from other *Amphimonhystera* species (with more or less longitudinal-shaped oval amphidial foveas) in having rather circular amphids. This contradicts the generic diagnosis and sets *A. circula* apart . However *A. circula* fits well with *Amphimonhystera* in other characters such as shape of the buccal cavity, pattern of cephalic sensilla and spicular apparatus, etc.

Position of the gonad in relation to the intestine. A peculiar feature is the position of the female branch. In all studied females of *A. anechma*, *A. molloyensis* and *A. pallida*, the anterior portion of the ovary is situated to the left of the midgut, whereas the posterior portion is bent ventrally and placed to the right of the midgut. For both *A. circula* and *A. galea*, position of the ovaries are not known since females have yet to be found. In *A. marisalbi*, the ovary is situated entirely to the left of the intestine (two specimens), whereas in the other two females, the ovary is bent in a similar way to the other three species. The position of the ovary has a greater importance in the classification of Monhysteroidea; the family Xyalidae is characterised by the left position of the ovary, with very few exceptions (Lorenzen, 1978, 1981). The peculiar configuration of the ovary in *Amphimonhystera* is shared by *Valvaelaimus* Lorenzen, 1977 and many species of *Metadesmolaimus* Schuurmans Stekhoven, 1935. These latter two genera also display some other similarities with *Amphimonhystera*, such as brownish pigmentation, tail shape often lacking caudal setae and sometimes spicular apparatus. Lorenzen (1977: 206) considered the genera *Amphimonhystera*, *Metadesmolaimus* and *Valvaelaimus* to be closely related within Xyalidae. However, grouping of these three genera is not supported after an extensive cladistic analysis by Nicholas and Trueman (2002).

**Pictorial key for *Amphimonhystera* species**
(Figure 1, Tables 1–2)

We chose a pictorial key as a tool for identification, since species of *Amphimonhystera* differ from each other in morphometric characters or in some details which are difficult to verbalize in a conventional dichotomous key. The key is constructed according to principles of Platt (1984). The keys are utilised for various nematode taxa (e.g. Platt & Warwick, 1983, 1988; Warwick *et al*., 1998). In Tables 1 and 2 appended to the pictorial key (Fig. 1), the most important metric characters are summarised on the basis of currently available species descriptions. We include only males in Figure 1, since males have a greater number of distinguishing features than females and only four of the six species have had females reported. Some data denoted as “calc.pict.” were not given in the original diagnoses and hence are calculated by us from published drawings.

  

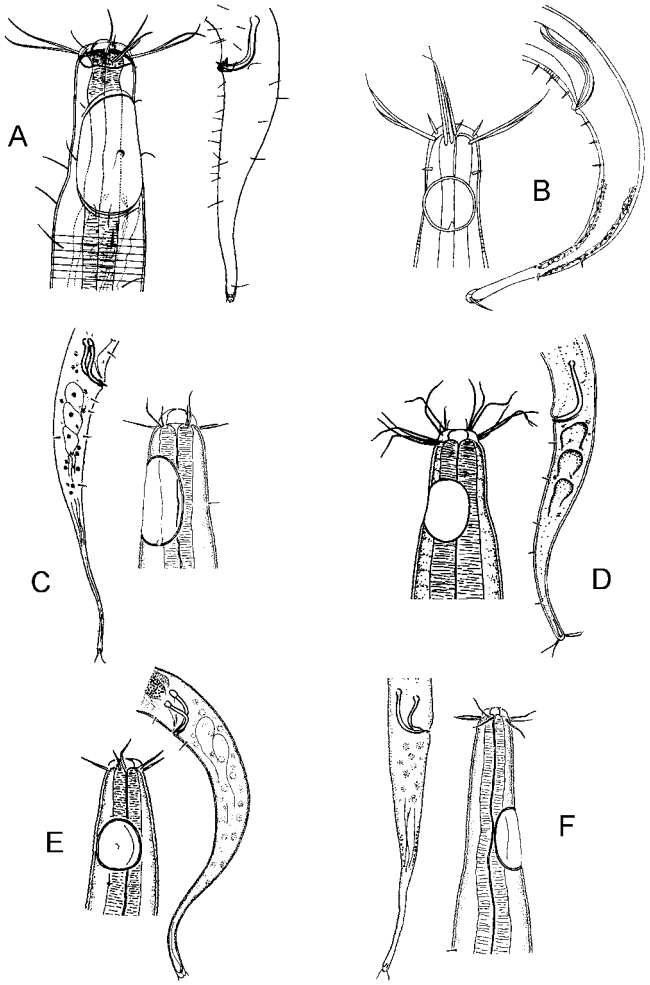


**FIGURE 1.** Pictorial key to *Amphimonhystera* species: **A** *A. anechma*; **B** *A. circula*; **C** *A. molloyensis*; **D** *A. galea*; **E** *A. marisalbi*; **F** *A. pallida*. Male, anterior and posterior body region.

**TABLE 1.** Male characters of *Amphimonhystera* species for the pictorial key

| Species | L | c.s. | c.s., % | am.l. | am.l./ am.w. | dis.am. | dis.am./am.l., % | spic.arc. | dist. tail portion, % | termin.s. |
|---|---|---|---|---|---|---|---|---|---|---|
| **(A)** *anechma* | 1950–2400 | 30 | 136–171 | 36–45 | 1.6–1.8 | 12–17 | 33–38 | 61–65 | 27–36 | very short or absent |
| **(B)** *circula* | 970 | 18 | 170–180 | 10 | 1.0 | 10 | 100 calc. pict. | 36–37 | 43 calc. pict. | 8–9 |
| **(D)** *galea* | 585–855 | 7–15 | 110–200 | 9 | 1.2–1.4 | 8–10 | 78–100 | 27–45 | 23–30 | 6–9 |
| **(E)** *marisalbi* | 533–570 | 3–5 | 58–71 | 6–7 | 1.0–1.1 | 7.5 | 107 | 15–16 | 22–30 | 2–3 |
| **(C)** *molloyensis* | 810–940 | 4–7 | 40–65 | 16–18 | 1.6 | 9–12 | 50–72 | 27–33 | 28–36 | 5–7 |
| **(F)** *pallida* | 655–735 | 3–7 | 60–140 | 11–12 | 1.2–1.4 | 14 | 117–127 | 24–26 | 24–27 | 4–5 |

  

**TABLE 2**. Female characters of *Amphimonhystera* species for the pictorial key

| Species | L | c.s. | c.s., % | am.l. | am.l./ am.w. | dis.am. | dis.am./ am.l., % | V, % | dist. tail portion, % | termin.s. |
|---|---|---|---|---|---|---|---|---|---|---|
| *anechma* | 2320–2400 | 34 | 179–190 calc. pict. | 27 | 1.3–1.4 calc. pict. | 18 | 54–67 calc. pict. | 85–86 | 33–42 calc. pict. | very short or absent |
| *marisalbi* | 695–870 | 3–4 | 54 | 7–10 | 1.2–1.3 | 7–9 | 78–100 | 73–78 | 26–34 | very short |
| *molloyensis* | 965–975 | 5–9 | 47–71 | 15–18 | 1.5–1.7 | 9–10 | 51.4–61.3 | 67–70 | 28–32 | 6–8 |
| *pallida* | 740 | 7 | 93 | 12 | - | 21 | 117–175 | 76 | 28 | 9 |

## Species descriptions

***Amphimonhystera galea* Fadeeva, 1984** (Figure 2 A–E)

**Material studied:** Three males.

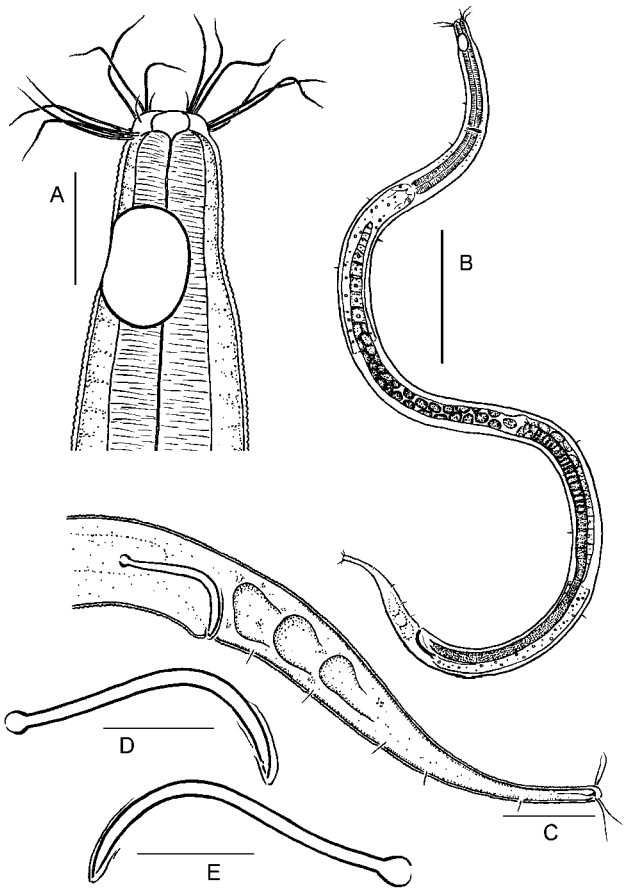


**FIGURE 2**. *Amphimonhystera galea* Fadeeva, 1984. (A) male 1, cephalic end; (B) male 1, entire; (C) male 1, tail region; (D) and (E) spicules of males 1 and 2. Scale bars: (A) 100 µm; (B) 10 µm; (C) 20 µm; (D) & (E) 10 µm.

  

**Locality:** The White Sea, Kandalaksha Bay, Karelian Shore, Velikaya Salma Strait, Kastjan Island, depth 23–25 m, silt. Collected on 5 August 1981 by a SCUBA diver.

**Reference material**: Three males are stored in the collection of the P. P. Shirshov Institute for Oceanology, Russian Academy of Sciences, Moscow, #M-1/15, M-1/16.

**Morphometric data:** Table 3.

**TABLE 3.** Morphometry of *Amphimonhystera galea* Fadeeva, 1984 from the White Sea.

| Specimens | Male 1 | Male 2 | Male 3 |
|---|---|---|---|
| Character | | | |
| L | 805 | 830 | 855 |
| a | 37.5 | 34.7 | 34.5 |
| b | 5.2 | 6.0 | 6.4 |
| c | 9.7 | 8.5 | 9.0 |
| b.diam.c.s. | 8.0 | 7.5 | 7.5 |
| b.diam.am. | 9.0 | 9.0 | 10.0 |
| b.diam.n.r. | 16 | 14 | 18 |
| b.diam.c. | 20 | 18 | 23 |
| diam.midb. | 22 | 24 | 25 |
| a.d. | 17 | 22 | 20 |
| i.l.s. | 1.5 | 1.5 | 2.0 |
| c.s. | 8.5–10.0 | 7.0 | 9.0 |
| c.s. (%) | 109–128 | 93 | 120 |
| am.l. | 10 | 10 | 10 |
| am.w. | 8 | 7 | 7 |
| am.w. (%) | 89 | 78 | 70 |
| am.l./am.w. | 1.25 | 1.43 | 1.43 |
| dis.am. | 9 | 8 | 9.5 |
| st.w. | 2.0 | 2.5 | 2.0 |
| st.l. | 3.0 | 3.5 | 3.5 |
| spic.chord | 25 | 23 | 28 |
| spic.arc | 30 | 27 | 35 |
| c' | 5.38 | 4.22 | 4.00 |
| dist. tail portion (%) | 30 | 29 | 30 |
| termin.s. | 6 | 7 | 7 |

**Description**: Small nematodes with slender, near cylindrical body. Cuticle thin, transversely striated, with peculiar brownish colour. No distinct lateral fields in the cuticle. Cephalic end distinctly narrowed anterior to the level of the amphids. Labial region slightly set off. Both outer labial setae and cephalic setae united in one crown with additional setae; lateral bundles with four setae and lateromedian bundles with three; in

  

total 20 setae in the cephalic circle of near equal length. Amphidial fovea large, longitudinally oval, without a central spot. Somatic setae short and scarce. Buccal cavity small, cup-shaped, its major portion made up by the cheilostoma. Esophagus slender and weakly muscular. Cardia small, internal. Two male gonads; anterior testis outstretched to the left of the intestine; posterior testis reflexed, to the right of the intestine. Spermatozoans (or spermatides?) relatively large, oval. Spicules small, archly bent in the distal half, distal end acute, proximal end cephalated. Gubernaculum reduced to a thin sheath around the distal quarter of the spicules. Tail continues very gradually to slender cylindrical portion. There are three caudal gland bodies visible within the tail. Three or four terminal setae and a few lateroventral setae twice to three times shorter in length.

*Discussion*: Our specimens fit well with the original description except "a" (34.5–37.5 *versus* 21.0–21.6), cephalic setae length (7–10 µm *versus* 12–15 µm), spicule length (22.5–28.0 µm *versus* 38–45 µm) and absence of an obvious spot in the amphidial fovea.

*Geography and ecology*: To date, the species has been recorded only from the Peter the Great Bay of the Japan Sea, at a depth of 32 m, in muddy sand (Fadeeva, 1984). Our finding is the second record of *A. galea*. Locality in the White Sea is similar in depth and, to some extent, in sediment type to that in the Japan Sea.

### *Amphimonhystera marisalbi* Tchesunov et Mokievsky sp. n.

(Figure 3, A–G)

**Type material**: Holotype male (ref # M-1/9), one paratype male (ref # M-1/10) and four paratype females (ref # M-1/11, M-1/12, M-1/13, M-1/14) mounted in glycerin on glass slides. Type specimens are deposited in the collection of the P. P. Shirshov Institute for Oceanology, Russian Academy of Sciences, Moscow..

**Type locality**: The White Sea, Kandalaksha Bay, Station CBB-20 (1A1), RV KARTESH, 66°23.47' N, 34°18.71' W, depth 270 m, 27.07.1998.

**Etymology**: *Marisalbi* (Latin) means "of the White Sea".

**Morphometric data***:* Table 4.

**TABLE 4**. Morphometry of *Amphimonhystera marisalbi* sp. n.

| Specimens | Holotype | Paratypes | | | | |
|---|---|---|---|---|---|---|
| | Male 1 | Male 2 | Female 1 | Female 2 | Female 3 | Female 4 |
| Label | CBB-20 1A1 63 µm (9) | CBB-34 1A2 63 µm (2) | CBB-23(1) 1C2 63 µm | CBB-23 1A1 125 µm (3) | CBB-20 3C2 125 µm | CBB-20 1A3 125 µm |
| Character | | | | | | |
| L | 535 | 570 | 735 | 870 | 695 | 710 |
| a | 33.2 | 35.6 | 37.5 | 43.0 | 34.4 | 33.2 |
| b | 5.5 | 6.1 | 5.6 | 6.5 | 5.3 | 6.1 |

*.....continued on the next page*

  

**TABLE 4** (continued)

| Specimen | Holotype | Paratypes | | | | |
|---|---|---|---|---|---|---|
| | Male 1 | Male 2 | Female 1 | Female 2 | Female 3 | Female 4 |
| c | 6.6 | 6.4 | 8.1 | 9.0 | 7.4 | 9.4 |
| V (%) | - | - | 73.6 | 77.2 | 73.4 | 77.6 |
| b.diam.c.s. | 6.0 | 7 | 6.5 | 8.5 | 6.5 | 6.5 |
| b.diam.am. | 10 | 7.5 | 9.0 | 11.5 | 9.0 | 10.5 |
| b.diam.n.r. | ? | 11 | 16 | 18 | ? | 17 |
| b.diam.c. | 15 | 15 | 20 | 20 | 18 | 19 |
| diam.midb. | 16 | 16 | 18 | 20 | 19 | 22 |
| a.d. | 15 | 13 | 16 | 15 | 15 | 15 |
| c.s. | 3.5 | 5.0 | 3.5 | ? | 4.0 | ? |
| c.s.(%) | 58 | 71 | 54 | ? | ? | ? |
| am.l. | 7 | 6 | 7 | 10 | ? | 9 |
| am.w. | 6.5 | 5.5 | 5.5 | ? | ? | 7.0 |
| am.w. (%) | 65 | 74 | 61 | ? | ? | 67 |
| am.l./am.w. | 1.08 | 1.09 | 1.27 | ? | ? | 1.29 |
| dis.am. | 7.5 | 7.0 | 7.0 | 8.5 | 7.0 | 7.0 |
| st.w. | 3.5 | 4.0 | 3.5 | 3.5 | 3.0 | ? |
| st.l. | 2.0 | 2.0 | 1.5 | 2.0 | 2.0 | 2.0 |
| spic.chord | 12.5 | 11.5 | - | - | - | - |
| spic.arc | 15.0 | 15.5 | - | - | - | - |
| c' | 5.44 | 6.87 | 5.65 | 6.51 | 6.31 | 5.10 |
| dist.tail portion (%) | 22 | 30 | 26 | 29 | 29 | 34 |
| termin.s. | 2.0 | 2.0 | 3.0 | 2.5 | 2.0 | ? |

**Description**: Body elongate fusiform. Cuticle thin, finely annulated, without any lateral field. ♀3 with light brownish cuticle and hypodermis with brown pigment granules; bodies of other specimens seem neither brownish nor yellowish. Cephalic end anterior to the amphidial fovea very slightly narrowed in some specimens. Inner labial sensilla hardly visible. Cephalic crown of sensilla in males and females consists of six pairs of moderate-sized setae (6 outer labial setae + 4 cephalic setae + 2 additional lateral setae). In the lateral pair, a ventral seta slightly shorter than the dorsal seta. Amphidial fovea large, slightly longitudinally oval or even rounded, with distinct cuticular rim and slightly asymmetrical central spot. No cervical setae. Short somatic setae scarcely distributed along the body. Buccal cavity very small and consisting mainly of a cheilostoma and an esophastoma reduced to a flat bottom. Esophagus slender, cylindroid, gradually widening to the cardia, with even radial muscular striation along its length. Cardia internal. No indications of a renette cell. Ovary of ♀1 and ♀3 situated entirely to the left side of the intestine. In ♀2 and ♀4, anterior portion of the ovary placed to the left of the intestine while posterior half portion bent to the right of the intestine. Uterus filled with small rounded spermatozoa. No postvulvar spermatheca. There are two (?) postvulvar glands with granular content. Anterior testis situated to the left of the intestine; posterior testis not seen. Spicules small

  

but very distinct and robust, abruptly bent in the middle. Distal ends acute, proximal ends cephalated. Gubernaculum indistinct, as a rod-like body at the spicule distal ends. Tail with proximal conical and a distal slender cylindrical portions gradually going over in one another. Tail tip slightly widened with two or three very short subventral and subdorsal setae. There are two caudal gland cell bodies discernible within the tail. There are several pairs of pre- and postanal lateroventral setae on the tail region.

**Diagnosis***:* Body length 535–870 µm. Outer labial and cephalic setae 3.5–5.0 µm long. Amphidial fovea 6–10 µm long; ratio length to width of the amphidial fovea 1.1–1.3; distance from cephalic apex to anterior rim of the amphidial fovea 7.0–8.5 µm. Spicules 15–16 µm long. Terminal caudal setae 2.0–3.0 µm long.

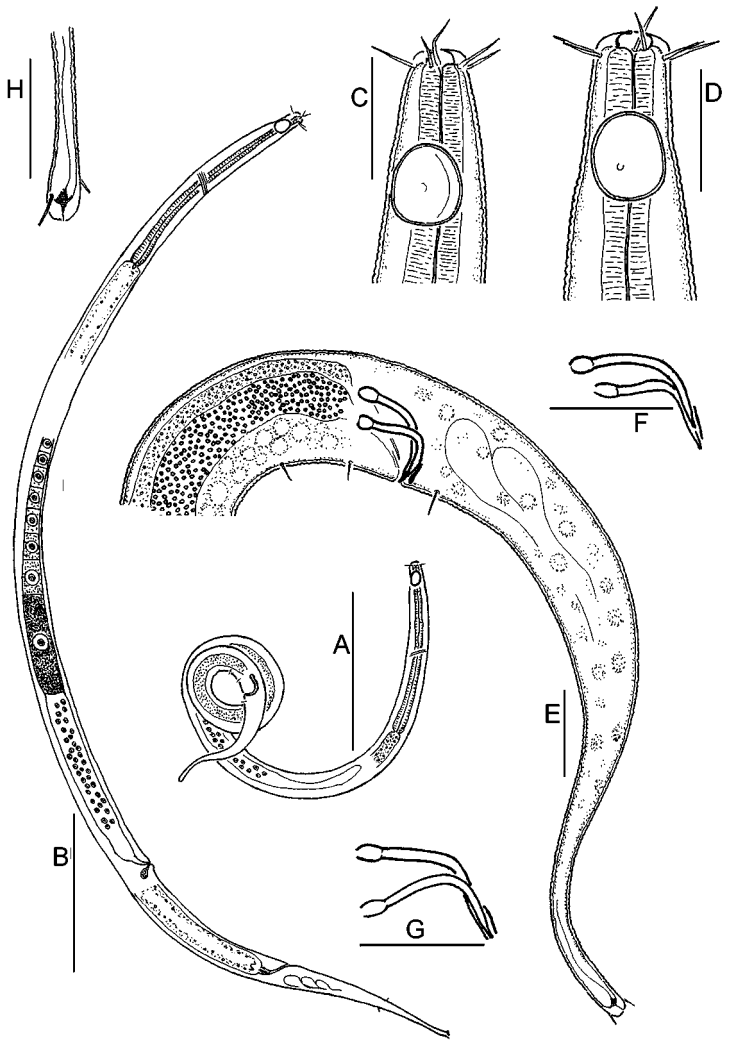


**FIGURE 3.** *Amphimonhystera marisalbi* sp. n. (A) male 2 (paratype), entire; (B) female 1 (paratype), entire; (C) male 1 (holotype), cephalic end; (D) female 1 (paratype), cephalic end; (E) male 2 (paratype), posterior body; (F) male 1 (holotype), spicules; (G) male 2 (paratype), spicules; (H) female 1 (paratype), tail tip. Scale bars: (A) & (B) 100 µm; (C)–(H) 10 µm.

  

**Differential diagnosis**: *Amphimonhystera marisalbi* sp. n. is similar to *A. galea* in general appearance and structural characters but differs by a very small or hardly visible inner labial sensilla, fewer of setae in the cephalic crown (12 *versus* 20) and by a number of morphometric characters such as shorter setae of the cephalic crown (3.5–5.0 µm *versus* 7–15 µm) and tail terminal setae (2.0–3.0 µm *versus* 6.0–9.0 µm).

***Amphimonhystera molloyensis*** **Tchesunov et Mokievsky sp. n.**
(Figures 4 A–E, 5 A–D & 6A–E)

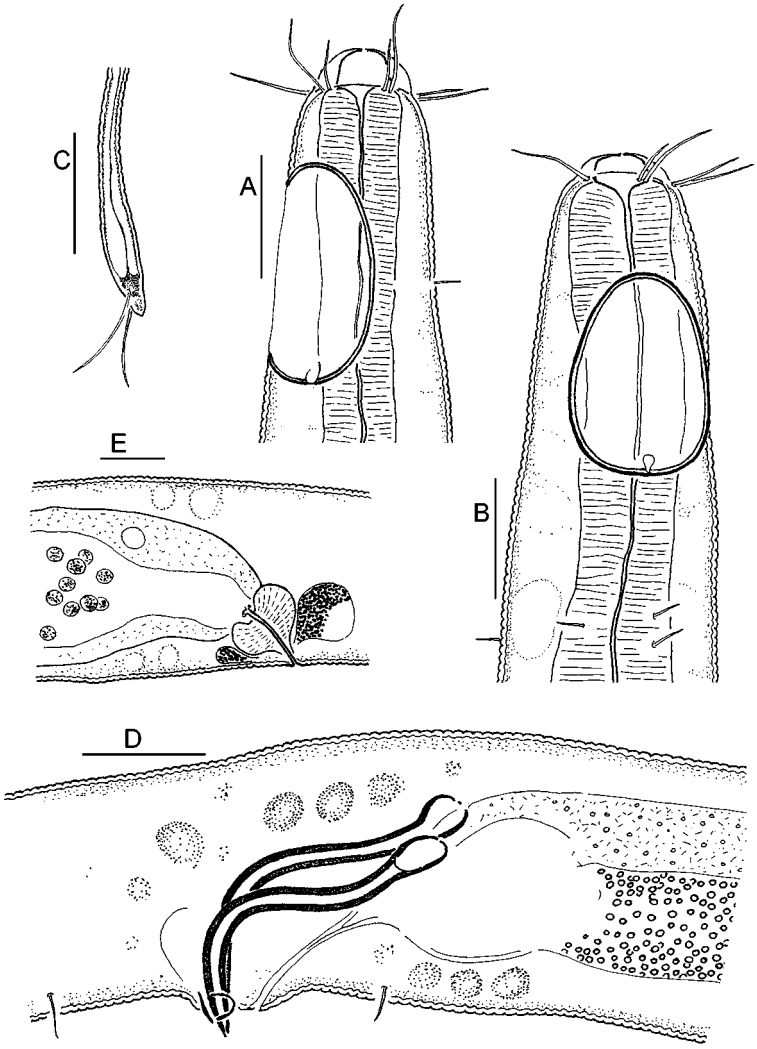


**FIGURE 4.** *Amphimonhystera molloyensis* sp. n., details. (A) male 1 (holotype), cephalic end; (B) female 1 (paratype), cephalic end; (C) female 1 (paratype), tail tip; (D) male 1 (holotype), copulatory apparatus; (E) female 2 (paratype), posterior uterus, vagina and vulvar glands. Scale bars: (A)–(E) 10 µm.

  

**Type material:** Holotype male, three paratype males and two paratype females mounted in glycerin on glass slides. Type specimens is deposited in the collection of the P. P. Shirshov Institute for Oceanology, Russian Academy of Sciences, Moscow.

*Labels*: (Holotype male ref #1-1/4 ): RV Polarstern, ARK XVII st. 125, B(0 – 1 cm), 63 µm, 1/44; (Paratype male 1 and paratype female 1 ref # M-1/6): RV Polarstern, ARK XVII, st. 125, C (0–1 cm), 250 µm, 2/2; (Paratype male 2, ref # M-1/5): RV Polarstern, ARK XVI, St. 251, MD 316 (0–1 cm), 125 mkmµm, 1/13; (Paratype male 3, ref # M-1/3): RV Polarstern, ARK XVI, St. 251, MD 316 (0–1 cm), 125 mkm; (Paratype female 2, ref # M-1/7): RV Polarstern, ARK XVII, st. 125, C (0–1 cm), 125 µm, 2/44.

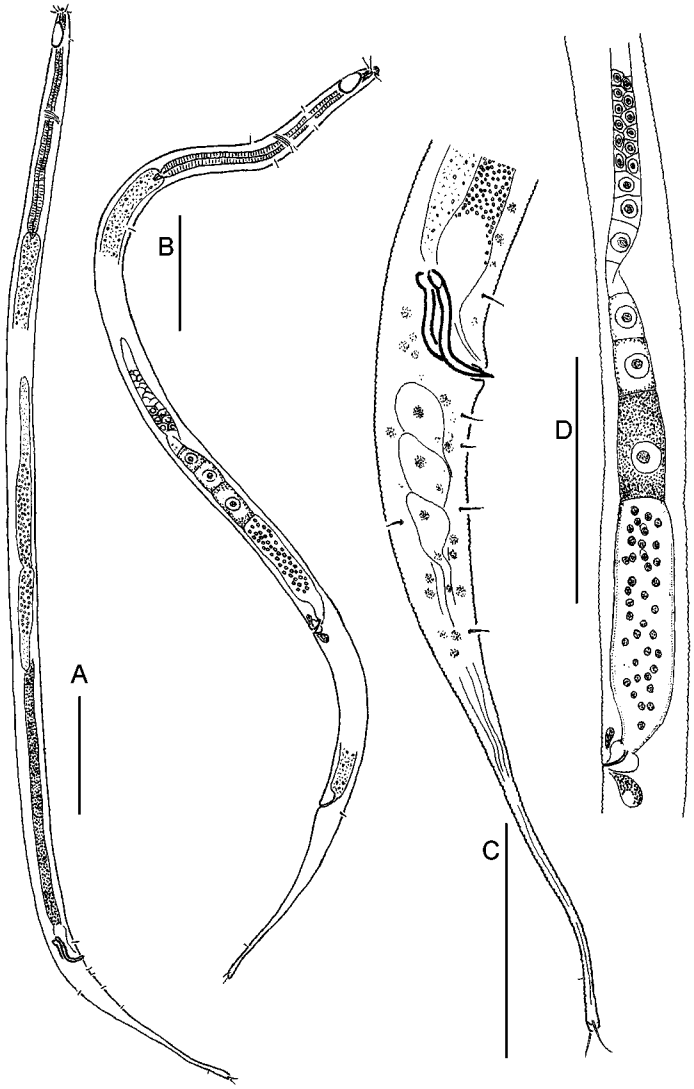


**FIGURE 5**. *Amphimonhystera molloyensis* sp. n., further details. (A) male 1 (holotype), entire; (B) female 2 (paratype), entire; (C) male 1 (holotype), posterior body region; (D) female 2 (paratype), genital branch. Scale bars: (A), (B), (D) 100 µm; (C) 50 µm.

  

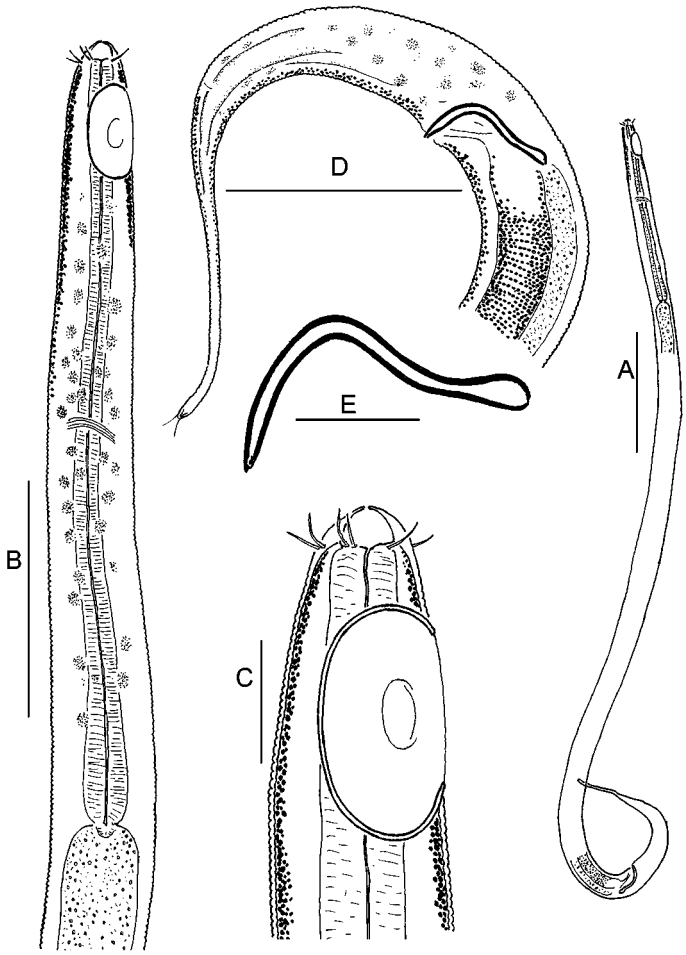


**FIGURE 6.** *Amphimonhystera molloyensis* sp. n., paratype male 2. (A) entire; (B) esophageal region; (C) cephalic end; (D) tail region; (E) spicule. Scale bars: (A) 100 µm; (B) & (D) 50 µm; (C) & (E) 10 µm.

**Type locality**: Arctic Ocean, area between Greenland and Svalbard. Holotype: st.125, 79°12.0' N 02°34.5' E, 5416 m, (Molloy Deep), silt, 13 July, 2001; Paratypes: St.251, 79°8.2' N & 02°53.6' E, depth 5569 m (Molloy Deep), silt, 16 August, 2000; and st.125, 79°12.0' N 02°34.5' E, 5416 m, (Molloy Deep), silt, 13 July, 2001.

**Etymology:** The species name refers to the area of its findings, Molloy Deep.

**Morphometric data:** Table 5.

  

**TABLE 5.** Morphometry of *Amphimonhystera molloyensis* sp. n.

| Specimens | Holotype | Paratypes | | | | |
|---|---|---|---|---|---|---|
| Label | Male 1 | Male 2 | Male 3 | Male 4 | Female 1 | Female 2 |
| Character | ARK XVII, st 125, B 0–1 cm, 63 µm, 1/44 | ARK XVI, st 251 MD 316, 0–1 cm, 125 µm, 1/ 2 (4) | ARK XVII, st 125, 0–1 cm, 250µm, 2/2 | ARK XVII, st 125, A 0–1 cm, 125 µm, 1/13 | ARK XVII, st 125, 0–1 cm, 250µm, 2/2 | ARK XVII, st 125, C 0–1 cm, 125µm, 2/44 |
| L | 940 | 810 | 940 | 895 | 965 | 975 |
| a | 36.7 | 35.2 | 35.1 | 37.6 | 32.4 | 29.8 |
| b | 5.3 | 5.2 | 6.1 | 5.7 | 5.8 | 5.9 |
| c | 6.8 | 6.6 | 6.6 | 6.7 | 6.5 | 7.1 |
| V (%) | - | - | - | - | 67.2 | 70.5 |
| b.diam.c.s. | 10 | 10 | 9 | ? | 12 | 11 |
| b.diam.am. | 15 | 14 | 16 | 14 | 16 | 16 |
| b.diam.n.r. | 22 | 19 | 22 | ? | ? | 23 |
| b.diam.c. | 22 | 21 | 22 | 22 | 26 | 25 |
| d iam.midb. | 26 | 23 | 27 | 24 | 30 | 30 |
| a.d. | 22 | 19 | 22 | 21 | 20 | 19 |
| c.s. | 6.5 | 4.0 | 5.0 | ? | 8.5 | 5.0 |
| c.s. (%) | 65 | 40 | 56 | ? | 71 | 48 |
| am.l. | 18.0 | 18.0 | 16.0 | 16.0 | 17.5 | 15.5 |
| am.w. | ? | ? | ? | 10.0 | 10.5 | 10.0 |
| am.w. (%) | ? | ? | ? | 74.1 | 67.7 | 62.5 |
| am.l./am.w. | ? | ? | ? | 1.60 | 1.67 | 1.55 |
| dis.am. | 9.0 | 9.0 | 9.0 | 11.5 | 9.0 | 9.5 |
| st.w. | 5.0 | 4.0 | 5.5 | 6.0 | 5.5 | 7.0 |
| st.l. | 4 | 4 | 8 | 4 | 6 | 3 |
| spic.chord | 24.0 | 24.0 | 25.5 | 24.0 | - | - |
| spic.arc | 30.0 | 27.0 | 32.5 | 30.0 | - | - |
| c' | 6.4 | 5.4 | 6.7 | 6.4 | 7.6 | 7.2 |
| dist. tail portion (%) | 28 | 34 | 29 | 36 | 32 | 28 |
| termin s. | 6.5 | 6.0 | 5.0 | 6.5 | 7.5 | 6.0 |

**Description:** Body slender, elongated spindle-shape, near cylindrical. Cuticle rather thin and finely transversely striated. In one specimen (♂2), subcuticular hypodermis yellow-brownish granules irregularly distributed throughout the body; pigment granules concentrated in preneural region (especially densely just posterior to the amphidial fovea) and thereafter less densely in posterior body region and tail, predominantly in ventral position. In other specimens, males and females as well, there are no conspicuous pigment granules in the anterior hypodermis. Labial region dome-shaped and slightly set off from the rest of the body. Inner labial sensilla not observed. Six outer labial sensilla and four cephalic sensilla setiform, and united with two additional lateral setae in one circle of twelve slender setae situated at the level of the stoma base. ♂2 distinguished with shorter

outer labial setae equal to cephalic setae and lacking additional setae. Amphidial fovea very large, longitudinally oval, with distinct cuticular edging; amphidial fovea of ♂2 with a convex central spot. The cuticular edging marked with a slight break posteriorly in some specimens. The amphidial fovea situated relatively close to the anterior end. Somatic setae scarce and short, mostly in sublateral position. Buccal cavity small, with very weakly sclerotised walls. The cheilostoma forming the major part of the buccal cavity. The posterior stoma region or esophastoma very short, narrow and slightly asymmetrical. Esophagus uniform and weakly muscular, very slender, gradually widening to the cardia. Cardia internal. There is a thick dense internal lining in the midgut lumen. No indication of a renette cell. Anterior part of the female genital branch with germinal zone and smaller oocytes in two rows situated left of the intestine. Posterior part of the female branch with larger oocytes in one row folded ventrally to the right side of the intestine. The posteriormost part of the branch filled with small rounded spermatozoa. Vagina slanting and encircled by a strong sphincter. There are two sets of granular vulvar glands associated with the vagina, the anterior vulvar glands being much smaller than posterior ones. Five transparent ejaculatory glands visible at the left side of the ejaculatory duct of ♂1. Spicules short, twice bent, distally acute and proximally cephalated. No gubernaculum.

Tail consisting of a proximal conical and a distal slender cylindrical part. Tail tip slightly widened and provided with two subterminal setae.

**Remark:** ♂2 (paratype) is noticeably distinguished from other males and females by slightly shorter outer labial setae of the cephalic circle and intensive subcuticular pigmentation in the anterior body region (Fig. 6 B–C). These differences may be connected with the locality of ♂2, i.e. remote from the sites of other specimens.

**Diagnosis***:* Body length 810–975 µm. Outer labial and cephalic setae 4.0–8.5 µm long. Amphidial fovea large, 15.5–18.0 µm long; ratio length to width of the amphidial fovea 1.55–1.67; distance from cephalic apex to anterior rim of the amphidial fovea rather short, 9.0–11.5 µm. Spicules 27.0–32.5 µm long. Terminal caudal setae 5.0–7.5 µm long.

**Differential diagnosis***:* The new species shares with *A. galea*, *A. marisalbi* and *A. pallida* a relatively small body length (<1 mm) and tail shape with slender cylindrical portion bearing terminal setae. *A. molloyensis* sp. n. distinctly differs from both *A. galea* and *A. pallida* by very short setae of the cephalic circle and by proximal position of the amphidial fovea.

### *Amphimonhystera pallida* Tchesunov et Mokievsky sp. n.

(Figure 7)

**Type material:** Holotype male 1 (ref # M-1/1), paratype male 2 (ref # M-1/2) and paratype female 1 (ref # M-1/8) mounted in glycerin on glass slides. Type specimens are deposited in the collection of the P. P. Shirshov Institute for Oceanology, Russian Academy of Sciences, Moscow.

  

**Type locality**: Arctic Ocean, area between Greenland and Svalbard, 79°8.2' N & 02°53.6' E, depth 5569 m (Molloy Deep), silt, 16 August, 2000.

**Etymology**: The species name reflects the pale colouration of the species in comparison with some other brownish *Amphimonhystera* species.

**Morphometric data:** Table 6.

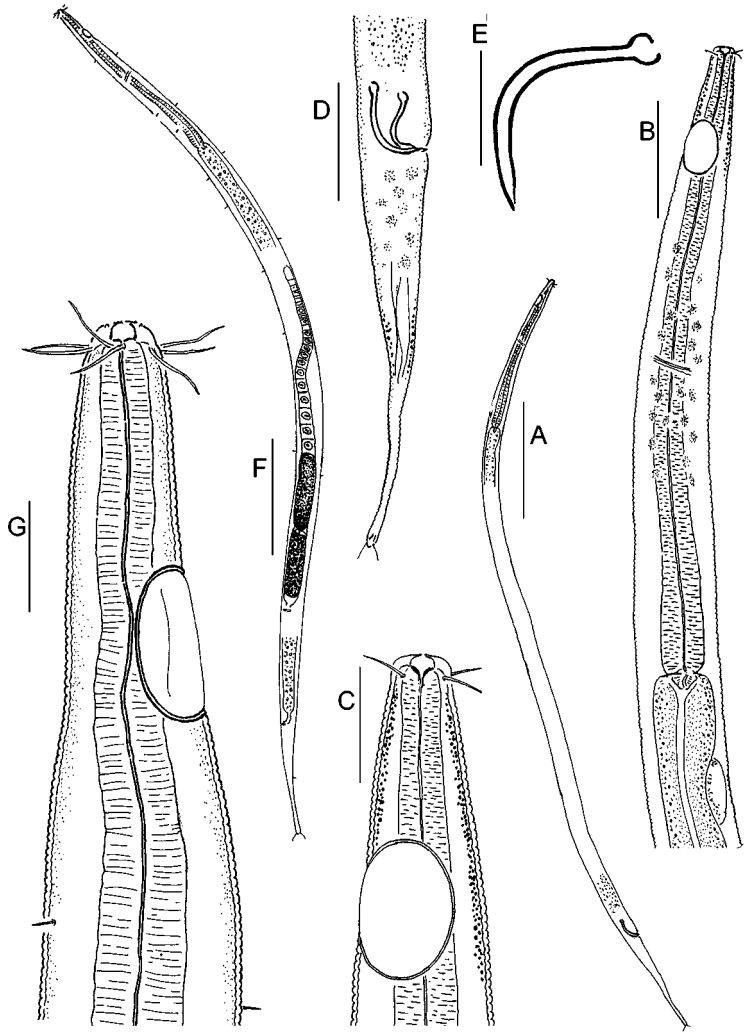


**FIGURE 7**. *Amphimonhystera pallida*. (A) male 1 (holotype), entire; (B) male 1 (holotype), esophageal region; (C) male 1 (holotype), cephalic end; (D) male 2 (paratype), tail; (E) male 1 (holotype), spicule; (F) female 1 (paratype), entire; (G) female 1 (paratype), anterior end. Scale bars: (A), (B), (D) & (F) 100 µm; (C), (E) & (G) 10 µm.

  

**TABLE 6.** Morphometry of *Amphimonhystera pallida*

| Specimen | Male 1 (holotype) | Male 2 (paratype) | Female 1 (paratype) |
|---|---|---|---|
| Label | ARK XVI,<br>St 251<br>MD 317, 1–2 cm, 63 µm, 1/ 21 | ARK XVI,<br>St 251<br>MD 322, 1–2 cm, 63µm, 1/ 58 | ARK XVII,<br>St 125,<br>B 0–1 cm, 125 µm, 1/42 |
| Character | | | |
| L | 655 | 735 | 740 |
| a | 32.7 | 35.0 | 24.8 |
| b | 5.0 | 5.5 | 5.5 |
| c | 8.3 | 8.2 | 8.3 |
| V (%) | - | - | 75.8% |
| b.diam.c.s. | 5.0 | 5.0 | 7.5 |
| b.diam.am. | 11 | 13 | 12 |
| b.diam.n.r. | 16 | 17 | 18 |
| b.diam.c. | 17 | 20 | 23 |
| diam.midb. | 20 | 21 | 30 |
| a.d.. | 15 | 15 | 17 |
| c.s. | 3 | 7 | 7 |
| c.s. (%) | 0.60 | 1.40 | 0.93 |
| am.w. | 8 | 10 | ? |
| am.l. | 11 | 12 | 12 |
| am.w. (%) | 73 | 77 | ? |
| am.l./am.w. | 1.4 | 1.2 | ? |
| dis.am. | 14 | 14 | 21 |
| st.w. | 2.0 | 2 | 3.5 |
| st.l. | 2.0 | 2.0 | 2.5 |
| spic. chord | 15 | 20 | - |
| spic. arc | 24 | 26 | - |
| c' | 5.3 | 5.9 | 5.2 |
| dist. tail portion (%) | 27 | 24 | 28 |
| termin s.l. | 4 | 5 | 9 |

**Description:** Small nematodes with slender, near fusiform to cylindrical body. Cuticle thin, with fine transverse annulation. Subcuticular yellow-brownish granulation weakly developed (mainly in pre-amphidial and amphidial regions) in males or nearly absent in female. Pre-amphidial region more or less narrowed. Labial region slightly set off. Inner labial sensilla as poorly visible tiny papillae. Outer labial and cephalic sensilla united in one circle of ten setae of moderate length. Amphidial fovea large, longitudinally oval, with distinct unbroken cuticular edging and without a visible central spot. Somatic sensilla short, scarcely distributed laterally along the body; nearly absent in midgut region.

  

Buccal cavity small; cheilostoma hemispherical; esophastoma narrow, funnel shaped, with sclerotised walls. Esophagus slender, weakly muscular, gradually widening to the posterior end. Cardia small, triangular, internal. Midgut with distinct internal lumen and peritrophic membrane. At a short distance posterior to the cardia, the midgut shifted dorsally by a cell body which may be a pseudocoelomocyte or cell body of a rudimental renette cell. Anterior portion of the female branch situated left of the intestine, posterior portion right of the intestine. Uterus with two ripe eggs. Vulva as a small transversal slit. No vulval glands discernible. Anterior strait testis poorly discernible; posterior testis not visible at all. Two ejaculatory glands left of the *vas deferens* and intestine in the paratype male. Spicules short and slender, sharply bent in the middle, distally acute and proximally cephalated. No gubernaculum. Tail with a proximal conical and a distal slender cylindrical portion. Tail tip slightly inflated, with two or three terminal setae. No other somatic setae visible in tail region.

**Diagnosis:** Body pale, 655–740 µm long. Outer labial and cephalic setae 3.0–7.0 µm long. Amphidial fovea, 11–12 µm long; ratio length to width of the amphidial fovea 1.2–1.4 µm; distance from cephalic apex to anterior rim of the amphidial fovea 14–21 µm. Spicules 24–26 µm long. Terminal caudal setae 4.0–9.0 µm long.

**Differential diagnosis:** *Amphimonhystera palida* sp. n. is similar *to A. galea*, *A. marisalbi* and *A. molloyensis* in body size. However, *A. pallida* differs from *A. galea* by having a much shorter cephalic setae length and shorter spicules; from *A. marisalbi* by a greater distance apex-amphidial fovea and longer terminal caudal setae; and from *A. molloyensis* by a greater distance apex-amphidial fovea.

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