Oncholaimus langhovdensis sp. nov.
(Nematoda: Enoplea: Oncholaimida),
a New Species of Free-living Marine Nematode from Langhovde, Dronning Maud Land, East Antarctica

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A new species of free-living marine nematode, Oncholaimus langhovdensis sp. nov., is described from the intertidal zone of Langhovde (near Syowa Station), Dronning Maud Land, East Antarctica. It closely resembles 11 congeners in the conico-cylindrical tail shape present in males and amphid and excretory pore positions, short spicules, and Demanian system structure present in females. However, it mainly differs from these congeners in body size, de Man’s ratios, tail length and shape, and Demanian system structure present in females. Oncholaimus langhovdensis sp. nov. also resembles four congeners known only by females, but it can be distinguished from them based on the tail length and uvette position. In addition to O. langhovdensis sp. nov., two undescribed species (Tripyloididae gen. sp. and Axonolaimidae gen. sp.) and four unidentified species (Sphaerolaimus sp., Oncholaimidae gen. sp., Comesomatidae gen. sp., and Chromadorida fam. gen. sp.) were found from the same locality.

Key Words: oncholaimid, Oncholaimidae, meiofauna, benthos, taxonomy, Syowa Station.

Introduction

During a faunal survey of intertidal meiofaunal animals in the vicinity of Syowa Station during the 56th Japanese Antarctic Research Expedition (JARE 56), an undescribed species of free-living marine nematode belonging to Oncholaimus Dujardin, 1845 was collected from coastal sand at Langhovde, East Antarctica. The genus Oncholaimus sensu lato (including Oncholaimium Cobb, 1930 and Pseudoncholaimus Kreis, 1932) contains more than 100 species (Gerlach and Riemann 1974; Gagarin and Nguyen 2011; Gagarin and Gusakov 2012; Pastor de Ward et al. 2013; Chen and Guo 2014; Smol et al. 2014; Gao and Huang 2016), most of which occur in marine or brackish environments (Smol and Coomans 2006), with 17 species described from the Antarctic region (Allgén 1932; Wieser 1953; Riemann 1956, 1958; Allgén 1959; Gerlach and Riemann 1974; Ingels et al. 2014). Nearly all described species were found in sub-Antarctic regions, and only O. longissimus Allgén, 1959 was reported from the coast of East Antarctica (Allgén 1959). Although seven species of free-living terrestrial nematodes were known around Syowa Station (Kito et al. 1991; 1996; Kito 2009), we present the first taxonomic report on marine nematodes in this region.

Materials and Methods

Specimens were collected by ACS on 31 January 2015 from the coast of Langhovde (69°14′24.3″S, 39°42′55.8″E), Lützow-Holm Bay, Dronning Maud Land, East Antarctica. Intertidal sandy sediments were sampled with a shovel and washed in fresh water; the supernatant was then filtered through a 32 µm mesh, and the extract was fixed in 10% formalin or 99% ethanol. Nematodes were sorted under a stereomicroscope, mounted individually in anhydrous glycerin on glass slides supported by a paraffin wax ring (Hooper 1986a) for differential interference contrast microscope observation, and dried in a critical-point dryer and sputter-coated with gold (Au) for scanning electron microscope (SEM) observation. All examined specimens were deposited in the Invertebrate Collection of Hokkaido University Museum, Sapporo, Japan and catalogued with the acronym ICHUM (formerly named as ZIHU, the Zoological Institute, Hokkaido University).

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Although DNA was extracted from ethanol-fixed specimens and their sequences were attempted to be determined following the protocol described by Shimada and Kajihara (2014), no data were obtained probably due to damage to the specimen.

Abbreviations: abd, body diameter at the anus (female) or cloaca (male); mbd, maximum body diameter; vbd, body diameter at the vulva. De Man's ratios (following Hooper 1986b): a, ratio of the body length to the maximum body diameter at the vulva. De Man's ratios (following Hooper 2014), no data were obtained probably due to damage to the specimen.

Table 1. Specimens collected from Langhovde. F, female; J, juvenile; M, male.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of individuals</th>
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<tbody>
<tr>
<td></td>
<td>Formalin-fixed</td>
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<tr>
<td></td>
<td>M</td>
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<tr>
<td>Oncholaimida</td>
<td></td>
</tr>
<tr>
<td>Oncholaimus langhovdensis  sp. nov.</td>
<td>7</td>
</tr>
<tr>
<td>Oncholaimidae gen. sp.</td>
<td>1</td>
</tr>
<tr>
<td>Enoplida</td>
<td></td>
</tr>
<tr>
<td>Tripyloidae gen. sp.</td>
<td>5</td>
</tr>
<tr>
<td>Axonolaimida</td>
<td></td>
</tr>
<tr>
<td>Axonolaimidae gen. sp.</td>
<td>1</td>
</tr>
<tr>
<td>Comesomatidae gen. sp.</td>
<td>2</td>
</tr>
<tr>
<td>Monhysterida</td>
<td></td>
</tr>
<tr>
<td>Sphaerolaimus sp.</td>
<td>1</td>
</tr>
<tr>
<td>Chromadorida</td>
<td></td>
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<tr>
<td>Chromadorida fam. gen. sp.</td>
<td>1</td>
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</tbody>
</table>

**Type locality and habitat.** Intertidal sandy sediment, Langhovde (69º14’24.3”S, 39º42’55.8”E), Lützow-Holm Bay, Dronning Maud Land, East Antarctica.

**Diagnosis.** *Oncholaimus langhovdensis* sp. nov. is characterised by slender body (a=75–91 in males, 56–70 in females), amphids located at posterior half of buccal cavity (39–82% of buccal cavity length), excretory pore located posterior to buccal cavity (2.2–2.8 times buccal cavity length from anterior body end), long conico-cylindrical tail without caudal papilla in both sexes (3.1–3.7 times abd in males, 2.6–3.1 times abd in females), short spicules (1.1–1.3 times abd and 33–38% of tail length), presence of Demanian system, short ductus uterinus (170–240 μm, 2.2–3.9 times vbd), and absence of terminal pores of main duct.

**Measurements.** See Table 2.

**Description.** Body (Fig. 1A, B) long, almost cylindrical, gradually tapering toward both ends. Cuticle thin and smooth. Head (Figs 1C, D, 3A, B) rounded, diameter at the level of cephalic setae 52–62% of mbd in males, 41–47% of mbd in females. Six lips each with an inner labial papilla (Fig. 3A). Six outer labial and four cephalic setae equal in length, arranged in a single circle. Amphids located at level of posterior half of buccal cavity (63–82% from anterior body end in males and 59–67% in females), width 19–32% of corresponding body diameter, consisting of a slit-like aperture and oval fovea. Buccal cavity large, barrel-shaped, length/width=2.1–2.3. Three well-developed teeth in buccal cavity, left subventral one largest and right subventral and dorsal ones equal in size. Cervical region (Fig. 1E) with sparse setae, tapering anteriorly, and almost cylindrical in posterior half. Ventral excretory pore at 2.2–2.8 times buccal cavity length from anterior body end (12–19% of pharynx length). Nerve ring at 41–54% of pharynx length. Ventral gland single, width 51–70% of corresponding body diameter, posterior end at 1.3–1.5 times pharynx length from anterior body end. Tail (Figs 1F–I, 3D, C) sexually dimorphic. Rectum 1.2–1.5 times abd and 33–42% of tail length in males and 0.7–0.8 times abd and 26–30% of tail length in females. Three caudal glands (Fig. 2A) situated at 10–24 times abd anterior to cloaca in males and 6–13 times abd anterior to anus in females.

**Material examined.** Holotype. Male (ICHUM 5311), whole mount. Paratypes. Four males (ICHUM 5312–5315), four females (ICHUM 5316, 5317, 5319, and 5320), whole mounts. Non-type. An immature female (ICHUM 5318), whole mount; a male and a female (ICHUM 5321 and 5322, respectively), Au-coated SEM specimens.
A new *Oncholaimus* from Antarctica

Oncholaimus from Antarctica

Cylindrical part and nearly straight in cylindrical part (diameter 22–25% of abd). Ventral papilla in caudal region absent. A pair of short setae located at junction of conical and cylindrical parts of tail. Several pairs of extra caudal setae on cylindrical part. Two rows consisting of several setae on dorsal side of cloacal and caudal regions. Tip of tail slightly expanded, with a spinneret and two or three stout terminal setae.

**Female.** Reproductive system (Fig. 2C) monodelphic, posterior ovary absent. Anterior ovary 9–15% of whole body length, beginning at 49–62% from anterior body end. Uterus single, 8–12% of whole body length, beginning at 63–76% from anterior body end. Eggs elongated, length/width = 2.5–6.1, one to three in uterus. Vulva (Fig. 3F) slit-like, with swelling of body surface, situated at 71–84% from anterior body end. Demanian system (Fig. 2C–E) present. Ductus uterinus posterior to uterus, connecting to right side of main duct through uvette at 2.2–3.9 times vbd posterior to vulva. Ductus entericus anterior to uterine, connecting to dorsal side of intestine through osmosium at 1.1–2.4 times vbd posterior to vulva (1.2–2.1 times vbd anterior to uvette). Main duct inconspicuous in posterior body region, unbranched. Terminal pore indistinct on body surface. Tail (Figs 1I, 3D) 2.6–3.1 times abd long, conico-cylindrical but different in shape compared with that in males, anterior 69–77% conical and diameter of cylindrical part 15–21% of abd. Tip of tail not expanded. Several circumanal and caudal setae present.

**Etymology.** The specific name, *langhovdensis*, is an adjective derived from the type locality Langhovde.

**Remarks.** According to previous studies (Filipjev 1918; Steiner 1921; Ditlevsen 1928; Cobb 1930; Kreis 1932, 1934; Allgén 1935; Gerlach 1958; Allgén 1959; Wieser 1959; Chit-

Table 2. Measurements of *Oncholaimus langhovdensis* sp. nov. All measurements in µm, and are in the form: mean ± s.d. (range). Abbreviations: abe, anterior body end; peb, posterior end of buccal cavity.

<table>
<thead>
<tr>
<th>Character</th>
<th>Male</th>
<th>Female</th>
<th>Paratypes</th>
<th>Paratypes</th>
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<tbody>
<tr>
<td>n</td>
<td>—</td>
<td>4</td>
<td>4</td>
<td></td>
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<tr>
<td>L (mm)</td>
<td>4.1 ± 0.4 (4.4–5.2)</td>
<td>5.0 ± 0.3 (4.6–5.4)</td>
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<tr>
<td>a</td>
<td>75.4 ± 5.3 (80.1–90.6)</td>
<td>62.7 ± 6.0 (56.0–69.8)</td>
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<tr>
<td>b</td>
<td>7.1 ± 0.2 (7.0–7.5)</td>
<td>7.8 ± 0.2 (7.7–8.1)</td>
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<tr>
<td>c</td>
<td>38.0 ± 4.0 (37.0–46.1)</td>
<td>31.5 ± 4.5 (25.9–36.5)</td>
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<tr>
<td>V (%)</td>
<td>—</td>
<td>79.9 ± 6.2 (70.8–84.3)</td>
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<tr>
<td>Head diameter at cephalic setae</td>
<td>33 ± 1.5 (31–34)</td>
<td>37 ± 1.0 (36–38)</td>
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<td></td>
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<tr>
<td>Outer labial and cephalic setae length</td>
<td>6.7–8.0</td>
<td>7.7–8.0 (6.2–8.7)</td>
<td></td>
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<tr>
<td>Buccal cavity length</td>
<td>39 ± 0.6 (38–39)</td>
<td>42 ± 1.2 (41–43)</td>
<td></td>
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<tr>
<td>Buccal cavity diameter</td>
<td>18 ± 0.6 (17–18)</td>
<td>19 ± 0.6 (19–20)</td>
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<tr>
<td>Largest tooth tip from peb</td>
<td>31 ± 1.7 (29–33)</td>
<td>33 ± 1.5 (32–35)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other teeth tips from peb</td>
<td>23 ± 1.2 (22–25)</td>
<td>25 ± 1.0 (23–26)</td>
<td></td>
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</tr>
<tr>
<td>Amphids from abe</td>
<td>28–30</td>
<td>26–21 (24–29)</td>
<td></td>
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<tr>
<td>Amphid width</td>
<td>8.5–9.3</td>
<td>8.9–1.9 (7.5–11)</td>
<td></td>
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<tr>
<td>Excretory pore from abe</td>
<td>109 ± 0.4 (86–95)</td>
<td>103 ± 5.2 (97–106)</td>
<td></td>
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<tr>
<td>Nerve ring from abe</td>
<td>288 ± 12.17 (297–330)</td>
<td>324 ± 9 (310–331)</td>
<td></td>
<td></td>
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<tr>
<td>Posterior end of pharynx from abe</td>
<td>581 ± 67.2 (633–716)</td>
<td>636 ± 31 (604–666)</td>
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<tr>
<td>Posterior end of ventral gland from abe</td>
<td>769 ± 89.1 (805–956)</td>
<td>882 ± 45 (823–932)</td>
<td></td>
<td></td>
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<tr>
<td>Ventral gland diameter</td>
<td>29 ± 0.14 (28–31)</td>
<td>35 ± 8.5 (28–46)</td>
<td></td>
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<tr>
<td>mbd</td>
<td>55 ± 8.2 (53–60)</td>
<td>80 ± 9.0 (68–90)</td>
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<tr>
<td>abd</td>
<td>32 ± 3.4 (30–38)</td>
<td>57 ± 4.9 (52–63)</td>
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<tr>
<td>Rectum length</td>
<td>44 ± 5.2 (43–48)</td>
<td>43 ± 2.1 (41–45)</td>
<td></td>
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<tr>
<td>Tail length</td>
<td>109 ± 11.9 (106–130)</td>
<td>159 ± 17 (138–179)</td>
<td></td>
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<tr>
<td>Tail diameter at cylindrical part</td>
<td>8.0 ± 1.2 (7–9)</td>
<td>11 ± 1.7 (8–12)</td>
<td></td>
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</tr>
<tr>
<td>Caudal glands to cloaca/anus</td>
<td>381–627 ± 560–152 (360–767)</td>
<td>535 ± 157 (287–770)</td>
<td></td>
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</tr>
<tr>
<td>Spicules length</td>
<td>41 ± 14.2 (37–45)</td>
<td>—</td>
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<tr>
<td>Anterior testis from abe (mm)</td>
<td>1.2 ± 0.1 (1.2–1.5)</td>
<td>—</td>
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<tr>
<td>Total length of testes (mm)</td>
<td>1.6 ± 2.4 (2.1–2.7)</td>
<td>—</td>
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<tr>
<td>Ovary from abe (mm)</td>
<td>—</td>
<td>2.8 ± 0.3 (2.3–3.3)</td>
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<tr>
<td>Ovary length</td>
<td>—</td>
<td>619 ± 117 (463–741)</td>
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<tr>
<td>Uterus length</td>
<td>—</td>
<td>451 ± 76 (366–548)</td>
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<tr>
<td>Vulva from abe (mm)</td>
<td>—</td>
<td>4.0 ± 0.5 (3.3–4.5)</td>
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<tr>
<td>vbd</td>
<td>—</td>
<td>68 ± 8.1 (61–79)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egg length</td>
<td>—</td>
<td>209 ± 65 (152–318)</td>
<td></td>
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<tr>
<td>Egg diameter</td>
<td>—</td>
<td>58 ± 16 (39–76)</td>
<td></td>
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</tr>
<tr>
<td>Osmosium from vulva</td>
<td>—</td>
<td>108 ± 36 (83–149)</td>
<td></td>
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<tr>
<td>Uvette from vulva</td>
<td>—</td>
<td>215 ± 36 (174–239)</td>
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</table>
wood 1960; Filipjev 1968; Vitiello 1970; Belogurov et al. 1975a, b; Coles 1977; Belogurov and Belogurova 1978; Tsalolikhin 1979; Belogurov and Fadeeva 1980a, b; Belogurov et al. 1980; Smolyanko and Belogurov 1987; Pavlyuk 1991; Smolyanko and Belogurov 1991; Pastor de Ward 1993; Platonova and Kulangieva 1995; Huang and Zhang 2006; Leduc 2008; Shimada et al. 2009; Chen and Guo 2014), males of 35 species of the genus *Oncholaimus sensu lato* have conico-cylindrical tails (see taxonomic key below). Five species, *i.e.*, *Oncholaimus chiloni* Ditlevsen, 1930, *O. gladius* Ger-

Fig. 1. *Oncholaimus langhovdensis* sp. nov. Males ICHUM 5311 (holotype; A, C, E, F), 5312 (D), 5313 (G), 5314 (H), and a female ICHUM 5316 (B, I). A, male body; B, female body; C, head, ventral view; D, head, lateral view; E, anterior region; F, male tail, lateral view; G, male tail, lateral view; H, male tail, ventral view; I, female tail, lateral view. Abbreviations: a.t., anterior testis; e.p., excretory pore; i., intestine; n.r., nerve ring; ov., ovary; p., papilla; p.t., posterior testis; ut., uterus; v.d., vas deferens; v.g., ventral gland. Scale bars: A, B, 1 mm; C, D, 20 µm; E, 100 µm; F–I, 50 µm.
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Fig. 2. *Oncholaimus langhovdensis* sp. nov. Male ICHUM 5311 (holotype; A, B), females ICHUM 5316 (C, D) and 5317 (E). A, testes; B, left spicule, lateral view; C, female posterior region; D, uvette and osmosium, right lateral view; E, uvette and osmosium, ventral view. Abbreviations: a.t., anterior testis; d.e., ductus entericus; d.u., ductus uterinus; e., egg; i., intestine; os., osmosium; ov., ovary; p.t., posterior testis; ut., uterus; uv., uvette; v., vulva; v.d., vas deferens. Scale bars: A, C, 500 µm; B, 10 µm; D, E, 50 µm.

Fig. 3. *Oncholaimus langhovdensis* sp. nov., SEM images. A female ICHUM 5322 (A, B, D, F) and a male ICHUM 5321 (C, E). A, head, anterior view; B, head, lateral view; C, male tail, lateral view; D, female tail, lateral view; E, male cloacal region, ventral view; F, vulva, ventrolateral view. Scale bars: A, B, E, F, 10 µm; C, D, 50 µm.
lach, 1956, *O. longissimus* Allgén, 1959, *O. manilius* Gerlach, 1957, and *O. steineri* Ditlevsen, 1928, are not included in spite of their conico-cylindrical tails, because *O. chinloni* should be transferred to *Viscosa* de Man, 1890 based on its larger right subventral tooth than left one (Ditlevsen 1930), and the other four species should be transferred to *Metoncholaimus* Filipjev, 1918 based on the presence of gubernacula (Ditlevsen 1928; Gerlach 1956, 1957; Allgén 1959).

*Oncholaimus langhovdensis* sp. nov. closely resembles 11 of them based on the conico-cylindrical tails present in males and amphid (posterior half of buccal cavity) and excretory pore positions (2–3 times the buccal cavity length from the anterior body end), the short spicules (1.1–1.3 times abd and 30–40% of the tail length), and Demanian system present in females. *Oncholaimus langhovdensis* sp. nov. is easily distinguished from three anomalous species: *O. nigrocephalatus* Cobb, 1930 (with three masses of pigment granules at the base of the buccal cavity) (Cobb 1930; Timm 1952); *O. lanceolatus* Vitiello, 1970 (greatly elongated tail with a filiform posterior part) (Vitiello 1970); and *O. parapistonchon* Belogurov and Belogurova, 1978 (three teeth almost equal in size) (Belogurov and Belogurova 1978). It also differs from *O. apostematnus* Wieser, 1959, *O. olimum* (Belogurov et al., 1975), and *O. tchesunovi* (Platonova and Kulangieva, 1995) in the main duct of the Demanian system (single, unbranched duct without determinable pore in *O. langhovdensis* sp. nov. vs. branched duct with several pores in the three species) (Wieser 1959; Belogurov et al. 1975a, b; Zhang and Platt 1983; Platonova and Kulangieva 1995), from *O. malgassus* Gerlach, 1958 and *O. sheri* (Chitwood, 1960) in the female tail shape (anterior part tapering just posterior to the anus and diameter of the cylindrical part less than 1/4 of abd vs. anterior part tapering from the preanal region in *O. sheri*, and cylindrical part approximately 1/2 wide of abd in *O. malgassus*) (Gerlach 1958; Chitwood 1960), from *O. opisthonchon* Filipjev, 1927 and *O. ushakovii* Filipjev, 1927 in the more slender body shape (mbd=55–60 µm, a=75.4–90.6 in males vs. mbd=140 µm, a=37.1 and mbd=95–130 µm, a=43–59, respectively) (Filipjev 1927), and from *O. paracampylocercoides* (Smolyanko and Belogurov, 1991) in the smaller body size and longer pharynx (4.4–5.4 mm, b=7.0–8.1 vs. 6.2–7.2 mm, b=9.4–11.8) (Smolyanko and Belogurov 1991).

*Oncholaimus langhovdensis* sp. nov. resembles 13 congener known only by females. *Oncholaimus langhovdensis* sp. nov. most closely resembles four of them in the conico-cylindrical tail, amphid and excretory pore positions, and the Demanian system with a single main duct. However, it can be distinguished from *O. marinus* Schulz, 1932 and *O. unicus* (Belogurov and Belogurova, 1978) in the tail length (2.6–3.1 times abd vs. 6.5 times abd and 1.4–1.5 times abd, respectively) (Schulz 1932; Kreis 1934; Timm 1954; Belogurov and Belogurova 1978) and from *O. vanderlandi* Loof, 1973 and *O. jessicae* Coomans and Heyns, 1986 in the position of the uvette (174–239 µm= 2.2–3.9 times vbd posterior to vulva vs. 390 µm= 8 times vbd, and 596–856 µm= 13–20 times vbd, respectively) (Loof 1973; Coomans and Heyns 1986).

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**Key to Oncholaimus Species Having Conico-cylindrical Male Tail**

1. Demanian system absent ............................................. 2
   — Demanian system present or female unknown .............. 7
2. Subventral setae in cloacal and caudal regions arranged in two rows .................................................. 3
   — Subventral setae in cloacal and caudal regions arranged in a row .................................................. 3
3. Spicules slightly shorter than tail length
   — Spicules slightly shorter than a half of tail length .... 4
4. Body shorter than 4 mm ............................................. 5
   — Body longer than 5 mm ............................................ 6
5. Subcephalic setae present ................................. 6
   — Subcephalic setae absent ................................. 7
6. Amphids located in anterior half of buccal cavity ....
   — Amphids located in posterior half of buccal cavity .
   — Amphids located in posterior half of buccal cavity .
   — Amphids located in posterior half of buccal cavity .
6. Amphids located in anterior half of buccal cavity ....
   — Amphids located in posterior half of buccal cavity .
   — Amphids located in posterior half of buccal cavity .
   — Amphids located in posterior half of buccal cavity .
7. Spicules equal to or longer than tail ............. 8
   — Spicules shorter than tail ................................. 10
   — Spicules 1.5 times tail length ............................ 12
   — Spicules almost equal to tail length ........................ 9
8. Spicules equal to or longer than 2.0 abd ........ 11
   — Spicules shorter than 2.0 abd ........................... 13
9. Conical part 1/2 of tail length ............................. 13
   — Conical part 1/5 of tail length ............................ 15
10. Body shorter than 3 mm .................. 14
11. Body shorter than 3 mm .................. 15
12. Body longer than 7 mm ............................. 17
13. Body longer than 7 mm ............................. 18
14. Body longer than 7 mm ............................. 19
15. Body shorter than 4 mm ............................................. 19
16. Tail longer than 4.0 abd .................. 20
17. Tail shorter than 4.0 abd ............................. 21
18. Spicules almost half of tail length
   — Spicules slightly shorter than tail ....................... 19
   — Body shorter than 4 mm ............................................. 20
   — Body shorter than 4 mm ............................................. 21
   — Body shorter than 4 mm ............................................. 22
   — Body shorter than 4 mm ............................................. 23
   — Body shorter than 4 mm ............................................. 24
   — Body shorter than 4 mm ............................................. 25

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References


Cobb, N. A. 1930. The demanian vessels in nema of the genus Oncholaimus; with notes on four new oncholaims. Journal of
Kito, K. 2009. Taxonomical and ecological studies of free-living nematodes carried out in Antarctica as a cooperative research program of NIPR. Sapporo Medical Journal 78: 13–18. [In Japanese with English abstract]


Smolyanko, O. I. and Belogurov, O. I. 1991. On the study of the morphology and taxonomy of two nematode species of the genus Oncholaimium (Nematoda, Oncholaimidae) and comments on the independence of the genus and on synonymy of O. olum and O. sinensis. Zoologicheskii Zhurnal 70: 17–24. [In Russian]


