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Swedish Plectida (Nematoda). Part 4. The genus *Leptolaimus* de Man, 1876

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Table of Contents

Abstract	4
Introduction	5
Material and methods	5
Species descriptions	6
<i>Leptolaimus primus</i> sp. n.	6
<i>Leptolaimus papilliger</i> de Man, 1876	9
<i>Leptolaimus cupulatus</i> Lorenzen, 1972	12
<i>Leptolaimus danicus</i> Jensen, 1978	15
<i>Leptolaimus secundus</i> sp. n.	18
<i>Leptolaimus donsi</i> (Allgén, 1947) comb. n.	22
<i>Leptolaimus tertius</i> sp. n.	26
<i>Leptolaimus mixtus</i> Lorenzen, 1972	29
<i>Leptolaimus quartus</i> sp. n.	32
<i>Leptolaimus pellucidus</i> (Southern, 1914) comb. n.	35
<i>Leptolaimus venustus</i> Lorenzen, 1972	39
<i>Leptolaimus lorenzeni</i> (Boucher & de Bovée, 1972) comb. n.	43
<i>Leptolaimus quintus</i> sp. n.	46
<i>Leptolaimus sextus</i> sp. n.	49
<i>Leptolaimus alatus</i> Vitiello, 1971	53
<i>Leptolaimus septimus</i> sp. n.	56
<i>Leptolaimus octavus</i> sp. n.	60
<i>Leptolaimus macer</i> Lorenzen, 1972	63
<i>Leptolaimus septempapillatus</i> Platt, 1973	65
<i>Leptolaimus elegans</i> (Schuurmans Stekhoven & De Coninck, 1933) Gerlach, 1958	71
<i>Leptolaimus nonus</i> sp. n.	74
Review of the genus <i>Leptolaimus</i> de Man, 1876	77
Species transferred to other genera	92
Dichotomous key to species of <i>Leptolaimus</i> de Man, 1876	94
Acknowledgements	96
References	96

Abstract

Twelve known and nine new species of *Leptolaimus* are described from bottom sediments collected in marine habitats of Sweden, including the Bothnian Sea and Bothnian Bay, the Baltic Sea proper, Gullmarn Fjord and the Skagerrak. Three of these species have been previously recorded in Sweden while nine are new records for the Swedish fauna. The following known species are redescribed: *Leptolaimus papilliger* de Man, 1876, *L. cupulatus* Lorenzen, 1972, *L. danicus* Jensen, 1978, *L. donsi* (Allgén, 1946) **comb. n.**, *L. mixtus* Lorenzen, 1972, *L. pellucidus* (Southern, 1914) **comb. n.**, *L. venustus* Lorenzen, 1972, *L. lorenzeni* (Boucher & de Bovée, 1972) **comb. n.**, *L. alatus* Vitiello, 1971, *L. macer* Lorenzen, 1972, *L. septempapillatus* Platt, 1973, *L. elegans* (Schuurmans Stekhoven & De Coninck, 1933) Gerlach, 1958. *Leptolaimus primus* **sp. n.** is characterised by the 319–472 μm long body; rounded labial region continuous with body contour; cephalic setae 1.5–2.0 μm long; amphid located 7.0–11.5 μm from anterior end; first body pore located 18.5–28.0 μm from anterior end; lateral field originating 35 μm from anterior end; female without supplements, vagina without *pars refringens*, vulva midventral; male without tubular and with four alveolar supplements, alveolar supplements without sclerotized inner ring; spicules arcuate and 13.5–16.0 μm long. *Leptolaimus secundus* **sp. n.** is characterised by the 576–645 μm long body; rounded labial region continuous with body contour; cephalic setae 2.0 μm long; amphid located 6.5–7.0 μm from anterior end; first body pore located 23.0–28.5 μm from anterior end; lateral field originating 18.0–23.0 μm from anterior end; female without supplements, vagina without *pars refringens*, vulva midventral; male with single tubular and 9–15 alveolar supplements, tubular supplement weakly arcuate with blunt tips, alveolar supplements with sclerotized lining; spicules arcuate and 23.0–26.5 μm long. *Leptolaimus tertius* **sp. n.** is characterised by the 576–579 μm long body; rounded labial region continuous with body contour; cephalic setae 2 μm long; amphid located 4–5 μm from anterior end; first body pore located 21.0–23.5 μm from anterior end; lateral field originating 26–29 μm from anterior end; male with four tubular and 7–10 alveolar supplements, tubular supplements weakly arcuate with blunt tips, alveolar supplements with sclerotized inner ring; spicules arcuate and 25–26 μm long. *Leptolaimus quartus* **sp. n.** is characterised by the 597–686 μm long body; rounded labial region continuous with body contour; cephalic setae 2.0–3.5 μm long; amphid located 5.0–7.0 μm from anterior end; first body pore located 23.5–27.0 μm from anterior end; lateral field originating 19.0–27.0 μm from anterior end; male with three tubular and 8–9 alveolar supplements, tubular supplements straight with blunt expanded tips, alveolar supplements with sclerotized inner ring; spicules arcuate and 23.0–25.0 μm long. *Leptolaimus quintus* **sp. n.** is characterised by the 443–528 μm long body; rounded labial region continuous with body contour; cephalic setae 1.0–2.0 μm long; amphid located 7.0–10.0 μm from anterior end; first body pore located 18.0–28.5 μm from anterior end; lateral field originating 25.0–41.0 μm from anterior end; female with two tubular supplements (one just posterior to cardia and one in front of anus), vagina without *pars refringens*, vulva right-sublateral; male with 8–10 tubular and without alveolar supplements, tubular supplements weakly arcuate with anchor-like tips; spicules arcuate and 17.0–22.0 μm long. *Leptolaimus sextus* **sp. n.** is characterised by the 626–728 μm long body; truncated labial region offset from body contour; cephalic setae 1.5–2.0 μm long; amphid located 8.0–12.0 μm from anterior end; first body pore located 41.0–48.5 μm from anterior end; lateral field originating 28.0–41.0 μm from anterior end; female without supplements, vagina without *pars refringens*, vulva midventral; male with five (rarely six) tubular and without alveolar supplements, tubular supplements weakly S-shaped with bifid tips; spicules arcuate and 39.0–46.0 μm long. *Leptolaimus septimus* **sp. n.** is characterised by the 679–850 μm long body; truncate labial region offset from body contour; cephalic setae 2.5–3.5 μm long; amphid located 8.5–11.5 μm from anterior end; first body pore located 37.0–44.0 μm from anterior end; lateral field originating 26.5–37.0 μm from anterior end; female without supplements, vagina without *pars refringens*, vulva midventral; male with four (rarely five) tubular and without alveolar supplements, tubular supplements weakly S-shaped, with bifid or blunt tips; spicules arcuate and 31.0–33.5 μm long. *Leptolaimus octavus* **sp. n.** is characterised by the 541–638 μm long body; truncate labial region continuous with body contour; cephalic setae 1.5–2.0 μm long; amphid located 8.5–12.0 μm from anterior end; first body pore located 31.5–41.0 μm from anterior end; lateral field originating 26.0–40.0 μm from anterior end and expanding into bursa-like structures along the tail; female without supplements, vagina without *pars refringens*, vulva midventral; male with four tubular and without alveolar supplements, tubular supplements weakly S-shaped with dentate tips; spicules arcuate and 30.0–31.5 μm long. *Leptolaimus nonus* **sp. n.** is characterised by the 403–633 μm long body; rounded labial region continuous with body contour; cephalic setae 1.5–3.0 μm long; amphid located 8.0–10.0 μm from anterior end; first body pore located 16.5–29.0 μm from anterior end; lateral field originating 47.0–99.0 μm from anterior end and expanding into bursa-like structures along the proximal part of the tail; female without supplements, vagina with bacilliform *pars refringens*, vulva right-subventral; male with 4–5 tubular and without alveolar supplements, tubular supplements weakly arcuate with dentate tips; spicules arcuate and 17.0–26.0 μm long. The following nomenclatorial changes are proposed: *Eutelolaimus donsi* Allgén, 1947 is transferred to the genus *Leptolaimus*, as *L. donsi* (Allgén, 1947) **comb. n.**; *Halaphanolaimus cangionensis* Gagarin & Nguyen Vu Thanh, 2007 is transferred to the genus *Leptolaimus*, as *L. cangionensis* (Gagarin & Nguyen Vu Thanh, 2007) **comb. n.**; *Halaphanolaimus harpaga* Boucher & de Bovée, 1972 is transferred to the genus *Leptolaimus*, as *L. harpaga* (Boucher & de Bovée, 1972) **comb. n.**; *Halaphanolaimus lorenzeni* Boucher & de Bovée, 1972 is transferred to the genus *Leptolaimus*, as *L. lorenzeni* (Boucher & de Bovée, 1972) **comb. n.**; *Halaphanolaimus pellucidus* Southern, 1914 is transferred to the genus *Leptolaimus*, as *L. pellucidus* (Southern, 1914) **comb. n.**; *Halaphanolaimus rivalis* Gagarin & Nguyen Vu Thanh, 2007 is transferred to the genus *Leptolaimus*, as *L. rivalis* (Gagarin & Nguyen Vu Thanh, 2007) **comb. n.**; *Halaphanolaimus marinus* Kamran, Nasira & Shahina, 2010 is transferred to the genus *Leptolaimus* as *L. marinus* (Kamran, Nasira & Shahina, 2010) **comb. n.** and considered a junior synonym of *Leptolaimus rivalis* (Gagarin & Nguyen Vu Thanh, 2007) **comb. n.**; *Halaphanolaimus sergeevae* Ürkmez & Brennan, 2013 is transferred to

the genus *Leptolaimus* as *L. sergeevae* (Ürkmez & Brennan, 2013) **comb. n.**; *Leptolaimus vitielloi* **nom. nov.** is proposed for *Leptolaimus minutus* Vitiello, 1971 *nec L. minutus* (Schuurmans Stekhoven, 1942) **comb. n.**; *Polyolaimium exile* Cobb, 1920 is transferred to the genus *Leptolaimus*, as *L. exilis* (Cobb, 1920) **comb. n.** and is considered *species inquirendae*. A taxonomic review, tabular compendium and identification key for species of the genus *Leptolaimus* are also given.

Key words: *Alveolaimus*, *Boveelaimus*, Bothnian Sea, Bothnian Bay, Baltic Proper, Gullmarn Fjord, *Halaphanolaimus*, key, Leptolaimidae, *Leptolaimus*, *L. alatus*, *L. cupulatus*, *L. danicus*, *L. donsi*, *L. elegans*, *L. lorenzeni*, *L. macer*, *L. mixtus*, *L. nonus* **sp. n.**, *L. octavus* **sp. n.**, *L. papilliger*, *L. pellucidus*, *L. primus* **sp. n.**, *L. quartus* **sp. n.**, *L. quintus* **sp. n.**, *L. secundus* **sp. n.**, *L. septempapillatus*, *L. septimus* **sp. n.**, *L. sextus* **sp. n.**, *L. tertius* **sp. n.**, *L. venustus*, new species, SEM, Skagerrak, Sweden, taxonomy, *Tubulaimus*

Introduction

The genus *Leptolaimus* de Man, 1876 *sensu lato* (Holovachov & Boström, 2010) includes over 70 nominal species commonly found in marine and brackish habitats worldwide. Almost half of its species were described from North-European waters (Gerlach, 1956, 1959; Jayasree & Warwick, 1977; Jensen, 1978, 1991; Lorenzen, 1966, 1972a, 1972b; de Man, 1876; Platt, 1973; Schuurmans Stekhoven & De Coninck, 1933; Southern, 1914; Warwick, 1970) but only five (four valid) species were actually found along the coast of Sweden. *Leptolaimus pellucidus* (Southern, 1914) **comb. n.** was found in the Skagerrak near Flatbonden (Allgén, 1928) and Tjärnö (Willems et al., 2009). The second species, originally described as *Dermatolaimus longiseta* Allgén, 1934 on the basis of single female from the Swedish coast of Öresund (Allgén, 1934b), was never found again and its taxonomic status remains questionable. Fortunately, the type material was located in Allgén's collection and will be discussed in this paper. The third species, *Dermatolaimus parelegans* Allgén, 1934, which is now considered synonymous with *Leptolaimus elegans* (Schuurmans Stekhoven & De Coninck, 1933) Gerlach, 1958, was described from the Swedish coast of Kattegat (Allgén, 1934a). Type material of the latter species is also still preserved at the Swedish Museum of Natural History (SMNH Type-3319) and is discussed in the present paper. Two more species, *Leptolaimus papilliger* de Man, 1876 and *Leptolaimus elegans*, were frequently recorded along the Swedish coast of the Baltic Sea (Ólafsson & Elmgren, 1997; Modig & Ólafsson, 1998; Ólafsson et al., 1999), as well as along the Finnish coast of the Bothnian Bay (Schiemer et al., 1983).

Several other species were found in marine habitats of adjacent countries, and are therefore often included in the list of Swedish nematodes, such as *Leptolaimus danicus* Jensen, 1978, which was originally described from the Danish coast of Öresund (Jensen, 1978). The following four species included in the Swedish nematode fauna (Boström & Sohlenius, 2005) were all described from Kiel Bay in Germany and were not officially recorded in Sweden before: *Leptolaimus cupulatus* Lorenzen, 1972, *Leptolaimus mixtus* Lorenzen, 1972, *Leptolaimus nobilis* Gerlach, 1956 and *Leptolaimus tenuis* Gerlach, 1956.

Twenty one species belonging to the genus *Leptolaimus* were found during the recent sampling in marine and brackish habitats along the Swedish coast conducted as a part of the on-going STI-supported project "Taxonomy and distribution of free-living nematodes of the order Plectida in Sweden", and are described below. Of these, nine are new to the fauna of Sweden and nine are new to science.

Material and methods

Bottom sediment samples were collected in several locations in the southern part of the Skagerrak off the west coast of Sweden, in Gullmarn Fjord, as well as in the Baltic Sea and the Gulf of Bothnia. All samples from the west coast were collected with a bottom dredge or box corer and further sieved in the lab before fixation. Fresh water was used during sieving to induce osmotic shock in nematodes so they will detach from the substrate. Samples were immediately fixed in formaldehyde. Samples from the Baltic Sea and the Gulf of Bothnia were collected with a bottom corer and immediately fixed in formaldehyde. They were sieved in the lab using fresh water and post-fixed in formaldehyde solution. Formaldehyde-preserved specimens were transferred to pure glycerine using Seinhorst's (1959) rapid method as modified by De Grisse (1969). Permanent nematode mounts on glass slides were prepared using the paraffin wax ring method. Some specimens of *Leptolaimus pellucidus* and *L. elegans* were prepared for SEM as follows: specimens were post-fixed in 1% osmium tetroxide (OsO₄) and transferred to pure

43.	Tubular supplements in females located in front of anus and at anterior part of intestine	44
-	Tubular supplements in both females and males located only in front of anus/cloaca	50
44.	Tubular supplements in males in two groups, 4–6 in the anterior group and 4–5 in the posterior group, reaching cardia	
 <i>L. quintus</i> sp. n.	
-	Tubular supplements in males in two groups, 1–3 in the pharyngeal region and several precloacal	45
45.	Supplements in the precloacal group equidistantly arranged	46
-	Supplements in the precloacal group separated, with the anteriormost supplement located at double or more distance from the second anteriormost supplement	48
46.	Females with 5 tubular supplements (four along anterior part of intestine and one in front of anus)	<i>L. sergeevae</i>
-	Females with 2–3 tubular supplements (1–2-two along pharynx and anterior part of intestine and one in front of anus)	47
47.	Body 1.4–2.0 mm long; males with 2–3 tubular supplements in pharyngeal region and 6–8 tubular supplements in precloacal group	<i>L. pellucidus</i>
-	Body 0.4–0.5 mm long; males with 1 tubular supplement in pharyngeal region and 4–5 tubular supplements in precloacal group	<i>L. harpaga</i>
48.	Spicules longer than 25 µm (26–34 µm)	<i>L. rivalis</i>
-	Spicules shorter than 20 µm (16–18 µm)	49
49.	Body 0.63–0.74 mm long	<i>L. lorentzen</i>
-	Body 0.50–0.57 mm long	<i>L. cangionensis</i>
50.	Precloacal supplements separated, with the anteriormost supplement located at double or more distance from the second anteriormost supplement	<i>L. paravemustus</i>
-	Supplements in the precloacal group equidistantly arranged	51
51.	Males with 10 tubular supplements; body 1.8–2.1 mm long	<i>L. affinis</i>
-	Males with 3–5 tubular supplements; body 0.5–0.8 mm long	52
52.	Males with 5 tubular supplements; tail relatively short ($c'=4$), uniformly conoid	<i>L. membranatus</i>
-	Males with 3–4 tubular supplements; tail longer ($c'=4.5-6.5$), conoid anteriorly and cylindrical posteriorly	53
53.	Spicules 15 µm long; cephalic setae 1.5 µm long	<i>L. vemustus</i>
-	Spicules 23–35 µm long; cephalic setae 3.0–4.5 µm long	<i>L. paravemustus</i>

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