New species of free-living freshwater nematodes from Eurasia

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Prionchulus major sp. n. found in a lake on the Novaya Zemlya archipelago (Russia) and *Leptolaimus primitivus* sp. n. from Biwa Lake (Japan) are described and illustrated. A redescription of *Monhystera amabilis* Gagarin, 1997 (including a description of the hitherto unknown male) based on specimens from Biwa Lake (Japan) and Kuril'skoe Lake (Kamchatka Peninsula, Russia) is given.

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Family **MONONCHIDAE**

Prionchulus major sp. n.
(Figs 1-4)

Holotype. ♀, **Russia**, Novaya Zemlya archipelago, North Island, Oval'noe Lake, depth 0.3 m, ground pebbles, boulders, 28.VIII.1998, slide No. 70/30, Institute of Parasitology, Russian Academy of Sciences, Moscow.

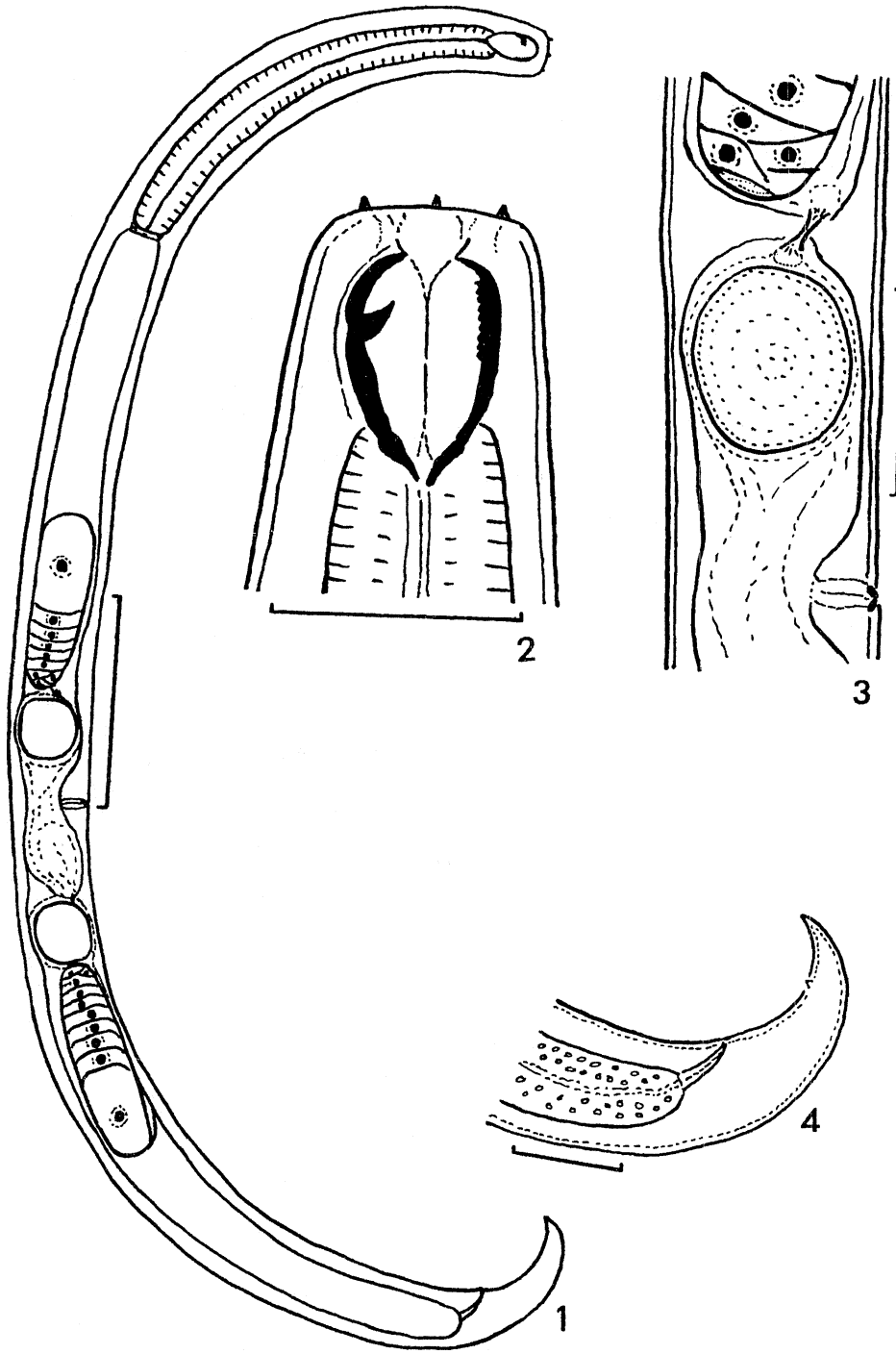
Paratypes. 2 ♀ collected with the holotype; 1 ♀ from running shallow lake, depth 0.2 m, ground pebbles, boulders, moss, 28.VIII.1998, Institute of Inland Waters Biology, Russian Academy of Sciences, Borok, Yaroslavl' Prov.

Measurements. See Table 1.

Description. Body arched, rather plump, 196-214 μm wide at mid-region. Cuticle smooth, 2.5-3 μm thick. Head 81-84 μm wide; lips conoid but low. Amphids calyciform, level with anterior part of stoma. Buccal cavity more or less ovoid, wider in its anterior part than in posterior one, about as long as labial diameter. Dorsal tooth strong, with acute apex, located in 16-18% of buccal capsule length. Subventral denticles moderately small, 9-10 on each ridge. Oesophago-intestinal junction not tuberculate. Intestinal cells large; rectum about 0.5-0.7 times as long as anal body diameter. Vulva transverse, with plum-shaped sclerotized

Table 1. Measurements of females of *Prionchulus major* sp. n.

Characteristics	Holotype	Paratypes (n = 4)	
		Range	Mean
L, mm	5.21	4.94-5.35	5.12
a	27	23-29	26
b	4.4	4.4-4.8	4.6
c	26.8	26.8-29.8	28.4
c'	1.7	1.6-1.9	1.7
V	59.1	56.0-59.2	57.6
Oesophagus length, μm	1176	1050-1177	1123
Posterior end of oesophagus-vulva, μm	1904	1722-1946	1830
Vulva-anus, μm	1946	1932-2058	1992
Tail length, μm	182	168-193	178
Labial region width, μm	82	81-84	83
Buccal cavity length, μm	84	83-85	84
Buccal cavity width, μm	56	50-56	55



Figs 1-4. *Prionchulus major* sp. n., female. **1**, general view; **2**, head; **3**, vulva region; **4**, tail. Scales: 500 μm (1), 200μm (3), 100 μm (2, 4).

Table 2. Measurements of *Monhystera amabilis* Gagarin

Characteristics	Lakes of Novaya Zemlya Archipelago		Kuril'skoe Lake, Kamchatka		Biwa Lake (Japan)	
	Holotype female	Females (n=16)	Females (n=10)	Males (n=2)	Females (n=3)	Males (n=3)
L, μm	1516	1353-1718	1407-1643	1330, 1365	1595-1663	1442-1526
a	21	21-31	22-26	37, 35	26-28	29-42
b	5.6	4.6-5.6	4.7-5.8	4.6, 4.9	5.1-5.3	4.9-5.3
c	5.4	4.7-5.7	5.4-5.9	5.5, 5.8	5.2-5.5	5.3-6.3
c′	8.3	7.5-10.0	6.9-8.9	7.2, 7.6	7.9-8.8	6.6-9.1
V	58	55-63	60.5-61.6	–	59.4-61.6	–
Oesophagus length, μm	270	270-343	273-322	291, 280	312-315	273-308
Posterior end of oesophagus-vulva, μm	616	532-682	602-714	–	633-714	–
Posterior end of oesophagus-cloaca, μm	–	–	–	798, 854	–	896-976
Vulva-anus, μm	350	234-395	259-337	–	336-343	–
Tail length, μm	280	260-339	252-294	241, 234	301-308	242-273
Vulva-anus : tail	1.3	1.0-1.4	1.0-1.2	–	1.0-1.1	–
Labial region width, μm	33	30-36	24-28	22, 22	22-24	22-23
Labial setae length, μm	14	12-15	11-14	10, 11	11-12	10-11
Labial setae length : labial region width, %	42	39-48	46-52	46, 50	47-50	46-50
Amphid diameter, μm	7.0	6.5-7.0	6.5-7.0	8.5, 8.5	6.5-7.0	8.0-9.0
Amphid diameter : corresponding body width, %	19	17-21	18020	30, 33	18-20	30-35
Anterior end to amphid, μm	23	20-27	20-24	22, 20	20-24	19-21
Anterior end to amphid : labial region width	0.7	0.6-1.0	0.8-1.0	1.0, 0.9	0.8-1.0	0.8-1.0
Spicula length, μm	–	–	–	48, 52	–	42-44
Spicula length : cloacal width	–	–	–	1.4, 1.7	–	1.3-1.6

pieces; vagina about 1/3 body width. Female gonads paired, with amphidromous ovaries. Each gonad 5.4-8.1 times as long as body diameter. Anterior uterus length 270-450 μm; posterior uterus 250-400 μm. Sclerotized valvular apparatus between oviduct and uterus. Uterus with one or tree eggs: 154-158 × 150-147 μm. Egg shell smooth. Spermatheca absent. Tail conoid or hooked with fairly acute terminus. Caudal gland reduced; terminal porus absent. In the last third/fourth of tail, a pair of subventral papillae present.

Comparison. The species is close to *P. spectabilis* (Ditlevsen, 1912), but differs in the longer body (in *P. spectabilis* ♀, L = 2.5-4.0 mm), larger buccal cavity (in *P. spectabilis*, buccal cavity 42 × 27 μm) and absence of spermatheca.

Etymology. The species name means "big, large".

Family **MONHYSTERIDAE**

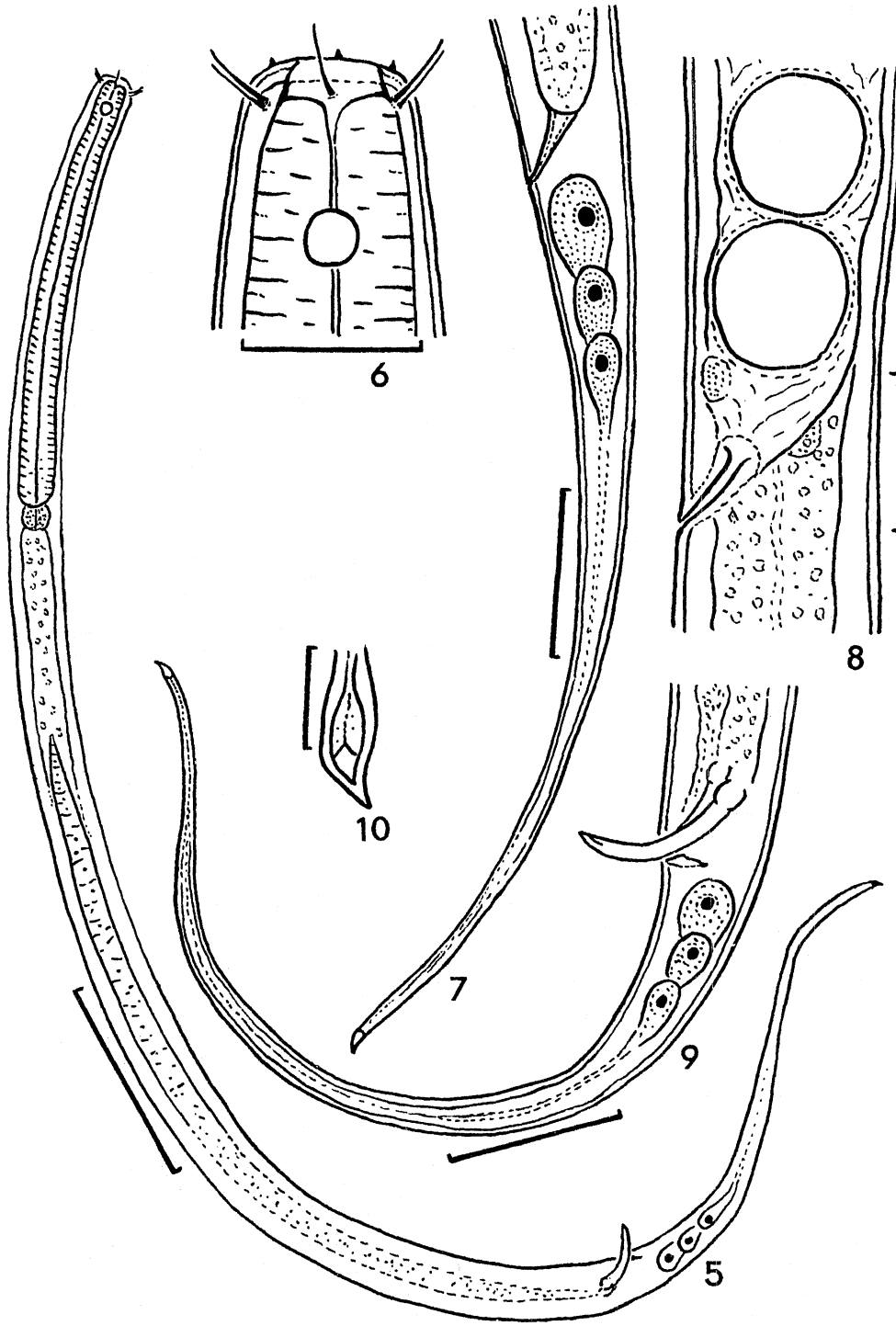
Monhystera amabilis Gagarin, 1997
(Figs 5-10)

Material examined. **Russia**: 17 ♀, Novaya Zemlya archipelago, South Island, Pan'kova Zemlya peninsula, lake No. 5, depth 0.3 m, ground detritus, silt, 29.VII.1995; 10 ♀, 2 ♂, Kamchatka Peninsula, Kuril'skoe Lake, depth 0.4 m, ground sand, silt, 29.VII.1998. **Japan**: 3 ♀, 3 ♂, Honshu Island, Biwa Lake, depth 0.3 m, ground sand, 17.XI.1998.

M. amabilis was described from a lake on Novaya Zemlya archipelago from females only (Gagarin, 1997). Males and numerous females are found in Kuril'skoe Lake (Russia, Kamchatka) and Biwa Lake (Japan).

Measurements. See Table 2.

Description. Female. Body after fixation slightly curved dorsad, open "C"-shaped. Cuticle smooth, transverse striation and longitudinal ridges absent. Thickness of cuticle in vulva



Figs 5-10. *Monhystera amabilis* Gagarin, 1997. **5**, general view of male; **6**, head of male; **7**, tail of female; **8**, vulva region; **9**, tail of male; **10**, terminus of tail. Scales: 150 μm (5), 50 μm (7-9), 25 μm (6), 10 μm (10).

region about 1.5 μm. Somatic setae situated only at tail, 4 μm long. Cristalloid bodies between internal organs and the cuticle absent. Front edge of labial region convex. A first ring of six inner labial papillae (about 2 μm long) and a second ring of six outer labial papillae (11-15 μm long) and four cephalic setae (9-11 μm long) on the more or less smoothly rectangular lip region; cephalic setae slightly but detectably shorter than outer labial setae. Labial region more or less continuous with the rest of the body. Cheilostoma wider than long, with refractive lining. Rest of stoma short, funnel-shaped. Buccal ring strongly cuticularized. Denticles in basal part of stoma absent. Amphidial fovea fairly wide (6.5-7.0 μm in diameter), circular; its position anterior, more or less constant; anterior margin of fovea situated at distance of 20-27 μm from anterior body end. Ocelli not seen. Oesophagus muscular, cylindroid, slightly swollen proximally. Nerve ring situated about at middle of oesophagus. Cardia large, rounded; their cells granular. One elongate-oval coelomocyte (40-45 μm long) sometimes situated ventrally, at anterior end of intestine. Rectum shorter than anal body width. Reproductive system prodelphic, monodelphic, often reaching up to the level of cardia, situated on the right side of the intestine. Vulva strongly post-equatorial, crescent-shaped, its sides curving posteriad. Lips of vulva not protruded. Vagina poorly developed, oblique, shorter than corresponding body diameter, with cuticularized lumen wall. Uterus long, with 1-4 spherical eggs (size 40-70 × 42-70 μm). Postvulval gland cell absent. Tail elongate-conoid, gradually tapering, 7.5-10.0 times as long as anal body diameter. Caudal gland hyaline; gland ducts unclear. Spinneret short, beak-like.

Male. Body after fixation curved ventrally. Cuticle smooth. Somatic setae situated only at tail. Cristalloid bodies between internal organs and the cuticle absent. A first ring of six inner labial papillae (about 2 μm long) and a second ring of six outer labial papillae (10-11 μm long) and four cephalic setae (8-9 μm long) on the more or less smoothly rectangular lip region. Amphidial fovea fairly wide (8-9 μm in diameter), circular, 30-35% of corresponding body diameter, situated at a distance of 19-21 μm from anterior body end. Reproductive system monorchic, proorchic, with outstretched testis situated on the right side of the intestine. Spicules slightly curved ventrally, 42-52 μm long, with large, rounded heads. Apical end of spicules bifurcated; velum not seen. Gubernaculum triangular, with dorsal apophysis. Ventromedian supplements absent.

Family **LEPTOLAIMIDAE**

Leptolaimus primitivus sp. n.
(Figs 11-15)

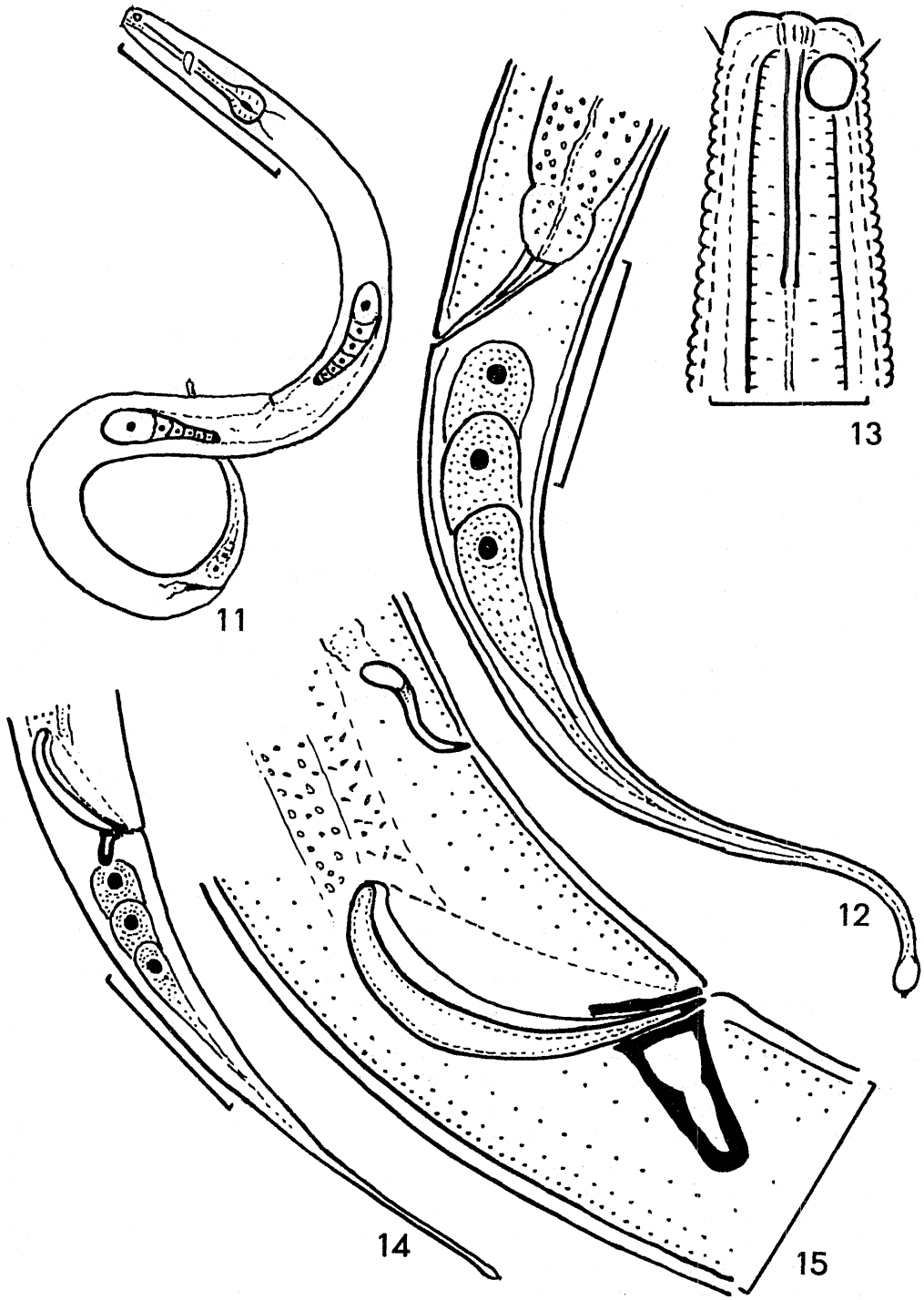
Holotype. ♂, **Japan**, Biwa Lake, Kito-Komatzu, depth 1.0-1.2 m, ground sand, boulders, macrophytes, 22.XI.1997, slide No. 9, Lake Biwa Museum, Japan.

Paratype. ♀ collected with the holotype; slide No. 10, Lake Biwa Museum, Japan.

Measurements. See Table 3.

Description. Male. Cuticle annulated; annulation begins from labial region and disappears to tail terminus. Annulus width about 1 μm; cuticle thickness about 1.5 μm. Lateral field narrow (2 μm wide; about 5% of body diameter), with 2 incisures. Labial region smooth, 15 μm wide; labial papillae not visible. Four cephalic setae 3 μm each (2% of labial region width). Amphids circular, diameter 5.5 μm (34% of corresponding body diameter). Anterior margin of amphids situated about 4 μm from anterior end of body (0.3 labial region width). Cheilostoma small, with longitudinal cuticularized ridges. Rest of stoma tubiform, 25 μm long, 2.5 μm wide. Stoma length 1.6 labial region width and about 0.15 oesophagus length. Oesophagus slender, muscular; its proximal end forms a well-defined bulb, which is 30 μm long, 27 μm wide, with inner cavity. Nerve ring situated about at middle of oesophagus. Excretory pore located at level of oesophagus bulb, 137 μm from anterior end of body. Reproductive system diorchic. Spicules slightly curved ventrally, without capituli, 38 μm long (about 1.4 anal body diameter). Gubernaculum sleeve-shaped, widened towards cloacal opening, with dorsal apophyses, 13 μm long, 20 μm high. 12 ventromedian supplements of distinctive form, 22 μm long. Supplement strongly curved in middle part; its proximal end with capitulum. Supplement row 336 μm long. Tail long, gradually tapering. Tail terminus slightly swollen. Caudal glands and spinneret present. Five pairs of setae, 7 μm long at tail.

Female. Similar to males in general characteristics. Labial region 14-15 μm wide. Cephalic setae 3 μm long. Amphid situated at base of labial region, 5.5 μm wide. Cheilostoma with longitudinal cuticularized ridges. Stoma 27-28 μm long. Basal bulb of oesophagus well-defined, its size 32 × 30 μm. Length



Figs 11-15. *Leptolaimus primitivus* sp. n. **11**, general view of female; **12**, tail of female; **13**, head of male; **14**, tail of male; **15**, cloaca region. Scales: 200 μm (11), 50 μm (12, 14), 25 μm (15), 15 μm (13).

Table 3. Measurements of *Leptolaimus primitivus* sp. n.

Characteristics	Holotype male	Paratypes, 2 females
L, μm	1138	1178, 1155
a	25	24, 25
b	6.9	6.8, 6.9
c	6.6	5.5, 5.5
c'	6.2	7.0, 6.8
V	–	44.7, 44.2
Oesophagus length, μm	165	172, 168
Posterior end of oesophagus-vulva, μm	–	357, 343
Posterior end of oesophagus-cloaca, μm	801	–
Vulva-anus, μm	–	438, 434
Tail length, μm	172	214, 210
Vulva-anus : tail	–	2.0, 2.1
Head width, μm	15	14, 15
Cephalic setae length, μm	4	4, 4
Cephalic setae length : head width, %	27	29, 27
Stoma length, μm	25	28, 27
Stoma length : head width	1.7	2.0, 1.8
Amphid diameter, μm	5.5	5.5, 5.5
Amphid diameter : corresponding body width, %	34	36, 34
Anterior end to amphid, μm	4	4, 4
Anterior end to amphid : head width	0.3	0.3, 0.3
Spicula length, μm	38	–
Spicula length : cloacal width	1.4	–

of rectum usually greater than anal diameter of body. Reproductive system didelphic, amphidelphic, with amphidromous ovaries. Vulva lips not protruded. Vagina short. Tail long, gradually tapering. Caudal glands and spinneret present.

Comprasion. The new species is close to *L. timmi* Vitiello, 1971 and *L. setiger* Sch.Stekhoven & de Coninck, 1933. From the first species, it is distinguished by the thicker body (a = 24-25 vs. 71.9-88.6 in *L. timmi*), localization of amphids (situated at distance 0.5 labial region width from anterior end of body vs. 2.1 in *L. timmi*), localization of excretory pore (at level of basal bulb of oesophagus vs. at nerve ring in *L. timmi*), longer spicules (spicula length 38 μm vs. 21-23 μm in *L. timmi* (Vitiello,1971)). From the second species, *L. setiger*, it differs in the thicker body (a = 24-25 vs. 59-107 in *L. setiger*), shorter cephalic setae (cephalic setae 3 μm long, 0.2 labial region width vs. 8-9 μm long, 1.5 labial region width in *L. setiger*), localization of amphids (situated at distance 0.5 labial region width from anterior end of body vs. 1.1-1.2 in *L.setiger*), longer spicules (38 μm long vs. 24 μm in *L. setiger*), and the number of supplements in males (12 supplements vs. 16 supplements in *L. setiger*) (Schuurmans Stekhoven & de Coninck, 1933).

Etymology. The species name means "ordinary, primitive".

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