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The genus *Tridentulus* Eyualem & Coomans, 1995 with description of *Tridentulus palustris* sp. n. from the Ukraine (Nematoda: Monhysterida) and a key to the species

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Summary. Six females and four males of a new free-living nematode species, *Tridentulus palustris* sp. n., were found during a nematological study of different habitats of the Shutsk National Natural Park, Ukraine. The new species is most similar to *T. brzeskii* Gagarin & Gusakov, 2000 from which it differs by having a shorter outer labial setae, more anteriorly situated amphidial fovea and males present. Brief morphometric characteristics of five valid species and a key to the species of the genus *Tridentulus* are given. *Tridentulus obscurus* Gagarin, 2001 is synonymized with *T. floreanae* Eyualem & Coomans, 1995.

Key words: dichotomous key, Monhysteridae, Nematoda, new species, swamp, *Tridentulus palustris*, Ukraine.

Six females and four males of a new free-living nematode species, *Tridentulus palustris* sp. n., were found during an investigation of the nematode fauna of soil and aquatic habitats of the Shutsk National Natural Park, Volynska Province, Ukraine. The nematodes were extracted by a modified Baermann funnel method, relaxed by gentle heat, fixed in cold TAF, processed to pure glycerine by a slow evaporation method and mounted on permanent slides in glycerine with paraffin as a coverslip support.

DESCRIPTION
Tridentulus palustris sp. n.
(Fig. 1, Table 1)

Female. Cuticle smooth, transverse striation absent. Thickness of cuticle in vulva region about 1.5 μm. Somatic setae and crystalloid bodies absent. A first ring of six setiform papillae (about 1.0 μm long), a second ring of six outer labial (3.0-3.5 μm long) and four shorter cephalic setae (about 2.5-3.0 μm long) in the base of labial region. Labial region slightly flattened, about 13-16 μm wide, 3.0-3.5 μm high, continuous with rest the of body. A ring of perioral platelets surrouds the 5.5-6.5 μm wide mouth opening. Cheilostoma wider than its length, with prominently refractive lining. Remainder of the stoma funnel-shaped. Three denticles, one dorsal and two ventrosublateral, at the stoma base. One of the ventrosublateral denticles infrequently observed. Amphidial fovea 4.5-5.0 μm in diameter, circular, anterior margin situated 13-15 μm (0.8-1.0 lip region widths) from anterior body end; *fusus amphidialis* unclear, more or less cylindrical, with slightly expanded base. Nerve ring situated at 36-40% of oesophageal length from anterior end. Cardia mushroom-shaped, 15-18 μm long, its width equal to or slightly larger than length; containing three large round glands; component tissue muscular, alternated with granular cytoplasm. Ventral gland cell well developed, elongate-oval, situated on ventral side of body, slightly posterior to cardia. Canal, ampula and pore of ventral gland cell not observed. One elongate coelomocyte usually situated near the ventral gland cell. Rectum as long as anal body width, with open lumen and gland cells. Reproductive system monodelphic, prodelphic; ovary situated right subventrally from the intestine. Germinal zone of

oogonia arranged in one or two rows; growth zone with a single row of continuously enlarging oocytes. Oviduct short and inconspicuous. Usually one egg in uterus, 50-65 (56) x 22-29 (25) μm. Vagina oblique, shorter than corresponding body diameter, thick and muscular. Vulva posterior to midbody, crescent-shaped, lips slightly protruded. Post-vulval gland cell incospicuous. Tail slender, gradually narrowing, more or less dorsally curved. Three caudal glands, terminating in a common chamber that opens through a spinneret. Tail-tip dorsally convex, ventrally concave.

Male. Similar to female in general morphology but body more strongly curved in posterior part. Cuticle smooth, transverse striation and somatic setae absent. A first ring of six setiform papillae (about 1.0 μm long), a second ring of six outer labial (3.5 μm long) and four shorter cephalic setae (2.5 μm long) in the base of labial region. Labial region slightly flattened, 14-15 μm wide, 3.0-3.5 μm high, continuous with the rest of the body. A ring of perioral platelets surrounds the 5.5-6.0 μm wide mouth opening. Three denticles, one dorsal and two ventrosublateral, at the stoma base. Amphidial fovea 4.0-5.0 μm in diameter, circular, its anterior margin situated at 13-14 μm (0.8—0.9 lip region widths) from anterior body end. Three cardial glands, muscular, with granular cytoplasm. Ventral gland cell situated on the ventral body side, slightly posterior to cardia; its canal, ampula and pore not observed. Testes simple, situated right subventrally from the intestine. Spicules slender, ventrally curved, with round anterior ends. Gubernaculum 9-11 μm long, rectangular, with prominent caudal apophysis 17-20 μm long. Precloacal supplementary structures absent. Tail slender, gradually narrowing, ventrally arcuate with posterior portion curved dorsad. Tail-tip dorsally convex, ventrally concave.

Differential diagnosis. The new species is most similar to *T. brzeskii* Gagarin & Gusakov, 2000 in body length, but differs from it by having shorter outer labial setae (3.0-3.5 μm, equal to 19-29% of the labial region in females *vs* 5.5-6.0 μm, equal to 32-37% of labial region in *T. brzeskii*), more anteriorly situated amphids (amphidial fovea situated 0.8-0.9 lip region widths from anterior body end *vs* 1.0-1.3 lip region widths in *T. brzeskii*) and males present *vs* absent).

Type locality and habitat. North-Western Ukraine, Volynska Province, Shutsk district, Gaivka village, Shutsk National Natural Park (51°34' N, 23°55' E), grass swamp, July 1998; *leg.* Holovachov.

Type specimens. Holotype female, and a paratype female and male deposited in the Laboratory of Nematology, Wageningen University, Wageningen, the Netherlands; two paratype females and one paratype male in the nematode collection of Institute of Inland Waters Biology, Borok, Russia; a paratype female and male deposited in each of the nematode collections of the State Museum of Natural History, L'viv, Ukraine and the German Nematode collection, Münster, Germany.

DISCUSSION

The genus *Tridentulus* was established by Eyualem *et* Coomans (1995b) for the species *Monhystera floreanae* Eyualem & Coomans, 1995a. Six species of the genus have been described: *T. floreanae* (Eyualem & Coomans, 1995a), *T. bidenticulatus* (Gagarin, 1997), *T. minor* Gagarin, 2001, *T. brzeskii* Gagarin & Gusakov, 2000, *T. obscurus* Gagarin, 2001, *T. palustris* sp. n. Gagarin (1997) described and illustrated under the name *Eumonhystera dispar* (Bastian, 1865) 34 females and 1 male from the lakes of the Novaya Zemlya Archipelago, Russia. These nematodes were characterized by the presence of 2-4 denticles at the base of the stoma. Subsequently, a morphologically similar population (17 females) was found in Lake Biwa, Japan, and both populations were united under the name *Tridentulus obscurus (*Gagarin, 2001). This species is closely related to *Tridentulus floreanae* in morphology, but differs by having a somewhat longer body (0.62-0.88 mm in *T. obscurus vs* 0.49-0.63 mm in *T. floreanae*) and comparatively shorter tail (c=5.2-6.8, c'=4.3-7.0 in *T. obscurus vs* c=4.5-5.3, c'=6.0-7.5 in *T. floreanae*, respectively). These morphological differences are here considered insignificant, representing intraspecific variability. Consequently, *T. obscurus* is considered to represent a junior synonym of *T. floreanae*. Brief morphometric characteristics of the species of the genus *Tridentulus* are given in Table 1. As males of two species belonging to the genus *Tridentulus* were recently described, an emended diagnosis of the genus is provided here.

Tridentulus Eyualem & Coomans, 1995

Diagnosis (after Eyualem *et* Coomans, 1995b, emended): Monhysteridae. Small longiform vermes. Cuticle finely annulated or smooth. Crystaloid bodies absent. Somatic setae present or

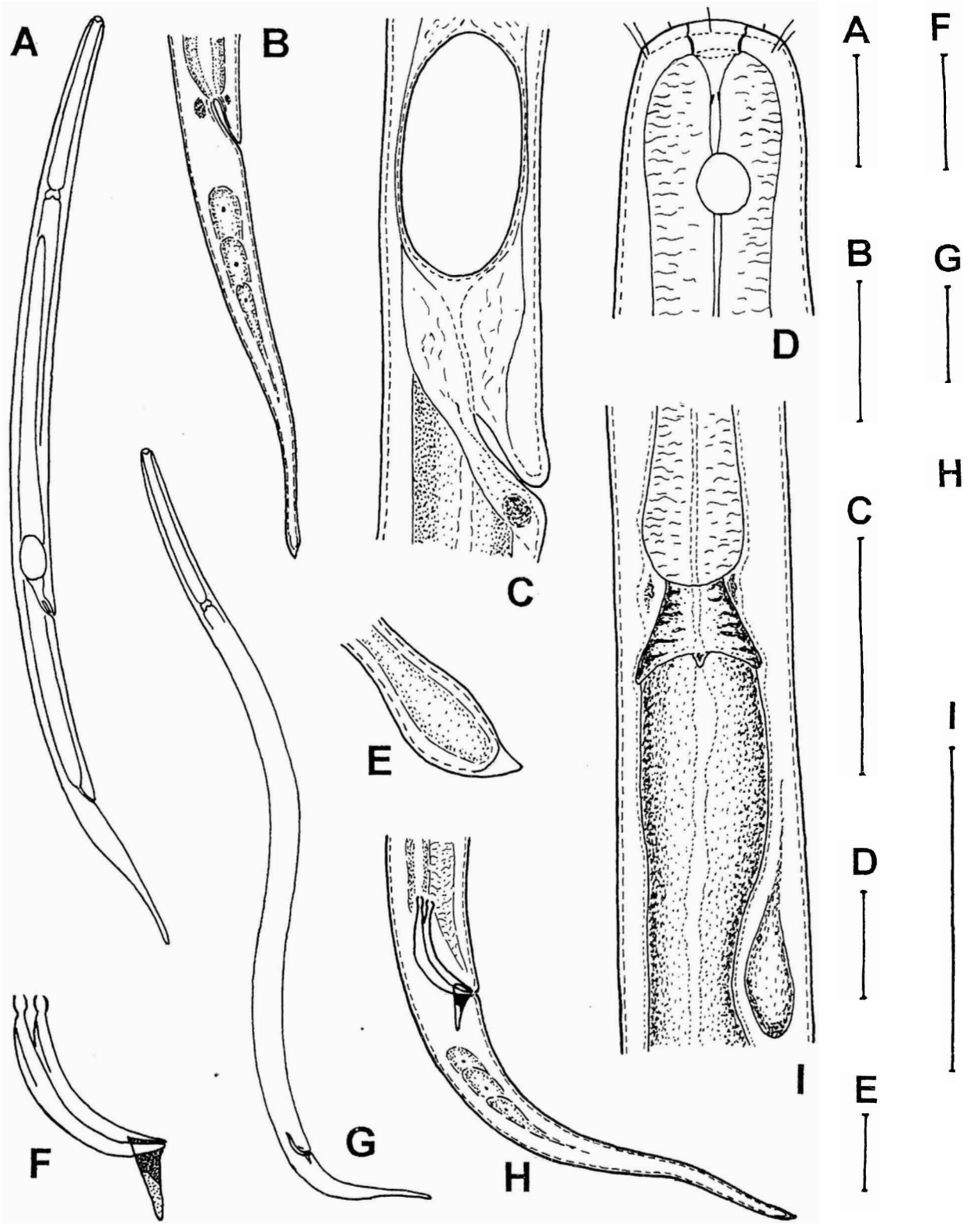

Fig. 1. *Tridentulus palustris* sp. n. A: Entire female; B: Female tail; C: Vulva region; D: Female head; E: Tail-tip; F: Spicules and gubernaculum; G: Entire male; H: Male tail; I: Cardial region of female. Scale bars: A & G - 100 µm; B, C, H & I - 50 µm; D, - 10 µm; E - 5 µm; F - 30 µm.

Table 1. Measurements (in μm, except L) of female and male *Tridentulus palustris* sp. n., and comparison with other *Tridentulus* species.

Characteristics	*T. palustris* sp. n.			*T. floreanae*[1]		*T. bidenticulatus*[2]	*T. minor*[3]	*T. brzeskii*[4]
	Holotype	Paratypes						
n	1 ♀	5 ♀♀	4 ♂♂	65 ♀♀	1 ♂	41 ♀♀	3 ♀♀	13 ♀♀
L (mm)	0.92	1.22 (0.92-1.16)	1.04 (0.99-1.09)	0.49-0.88	0.65	0.58-0.83	0.42-0.43	1.10-1.25
a	28	29 (27-31)	30 (29-33)	15-26	17	23-36	21-28	24-33
b	5.2	5.2 (5.0-5.4)	5.4 (5.0-5.7)	4.2-5.6	4.3	4.2-6.1	4.7	4.5-5.5
c	5.9	5.8 (5.6-6.0)	6.1 (5.9-6.4)	4.5-6.6	5.2	3.3-3.6	3.8-3.9	5.2-5.9
c'	7.0	7.8 (7.0-8.4)	6.7 (6.3-7.4)	4.3-7.5	4.7	8.9-15.0	10.0-11.1	7.0-10.0
V	62	62 (60-63)	–	60-70	–	56-66	61	61-64
Oesophagus length	178	201 (178-216)	193 (183-198)	105-192	153	106-175	90-92	220-253
Posterior end of oesophagus to vulva or cloaca	397	455 (383-480)	674 (665-722)	197-378	374	220-350	164-172	452-574
Vulva to anus	194	220 (192-263)	–	90-164	-	80-130	53-56	196-251
Tail length	156	184 (156-204)	171 (169-175)	98-151	126	154-199	109-112	193-232
Labial region width	15	15 (13-16)	15 (14-15)	13-24	18	10-12	6.5	15-17
Outer labial setae length	3.4	3.2 (3.0-3.5)	3.5	4.5-7.0	7	5.0-6.0	3.0	5.5-6.0
Outer labial setae length / labial region width, %	25	23 (19-29)	24 (23-25)	23-46	39	45-60	40-46	32-37
Amphid diameter / corresponding body width,%	31	29 (22-36)	27 (25-29)	10-26	19	23-35	25-33	30-35
Anterior body end to amphid/ labial region width	0.8	0.9 (0.8-1.0)	0.9 (0.8-0.9)	0.8-1.3	1.2	1.3-1.6	1.7-1.8	1.0-1.3
Vulva to anus / tail length	1.3	1.3 (1.1-1.8)	–	0.9-1.3	–	0.5-0.7	0.5	0.9-1.2
Spicules length	-	–	48 (45-51)	–	27	–	–	–

[1]Eyualem & Coomans (1995a, b); Gagarin, (1997, 2001); [2]Gagarin (1997); [3]Gagarin (2001); [4]Gagarin & Gusakov (2000).

absent. Amphids circular and small, at 0.8-1.6 lip region width from anterior body end. Lip region continuous the body. Sensillae in two circles. First ring of six small setiform sensilla; second ring of six outer labial (3.0-6.0 μm long) and third ring of four equal or shorter cephalic setae on the base of the labial region. Ring of perioral platelets surrounds the 4-7 μm wide mouth opening. Cheilostom wider than its length, with prominently refractive lining. Remainder of stoma funnel shaped. Three small denticles, one slightly anteriorly situated dorsal and two slightly posteriorly situated ventrosublateral at the stoma base. Pharynx more or less cylindrical with slightly expanded base. Cardia with glands. Ventral gland cell body well developed, situated on the ventral side of the body. A hyaline coelomocyte often present. Female reproductive system prodelphic, monodelphic with outstretched ovary. Uterus short, not muscular. Vulva postequatorial. Post vulval gland cell absent. Male reproductive system monorchic. Spicules paired, symmetrical, slender and curved ventrad. Gubernaculum with caudal apophysis. Precloacal supplements absent. Tail of both sexes similar, slender, gradually narrowing at anterior part and completely cylindrical in posterior. Spinneret usually directed towards the ventral side.

Type species: *Tridentulus floreanae* (Eyualem & Coomans, 1995a) Eyualem & Coomans, 1995b. Syn.: *Monhystera floreanae* Eyualem & Coomans, 1995a; *Tridentulus obscurus* Gagarin, 2001 syn. n.; *Eumonhystera dispar* (Bastian, 1865) apud Gagarin, 1997

Other species:

Tridentulus bidenticulatus (Gagarin, 1997) Gagarin, 2000; Syn.: *Eumonhystera bidenticulata* Gagarin. 1997;

Tridentulus minor Gagarin, 2001;

Tridentulus brzeskii Gagarin & Gusakov, 2000;

Tridentulus palustris sp. n.

Key to species of *Tridentulus*

1. Body length >1 mm.....2
- **Body length <1 mm**.....3
2. Outer labial setae 3.0-3.5 μm long, equal to 19-**29% of labial region width**..... *T. palustris* sp. n.
-Outer labial setae 5.5-6.0 μm long, equal to 32-37% of labial region width..... *T. brzeskii*
3. **Body length <0.5 mm**..... *T. minor*
- Body length 0.5-0.85 mm.....4
4. Tail length >150 μm (154-199 μm), c = 3.3-3.6, **c' = 8.9-15.0** ..... *T. bidenticulatus*
- Tail length <120 μm (98-120 μm), c = 5.2-6.8, c' = 4.7-7.0 ..... *T. floreanae*

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Гагарин В.Г., Головачев А. Обзор рода *Tridentulus* Eyualem & Coomans, 1995 и описание *Tridentulus palustris* sp. n. с Украины (Nematoda; Monhysterida).

Резюме. Во время исследования нематод различных биотопов Шацкого Национального Природного Парка (Украина) было собрано шесть самок и четыре самца нового вида свободноживущих нематод *Tridentulus palustris* sp. n. Новый вид наиболее близок к *T. brzeskii* Gagarin & Gusakov, 2000, от которого отличается более короткими губными щетинками внешнего круга, более передним расположением амфида и наличием самцов. Дана краткая морфометрическая характеристика пяти видов и ключ для определения видов рода *Tridentulus*. *Tridentulus obscurus* Gagarin, 2001 синонимизирован с *T. floreanae* (Eyualem & Coomans, 1995).