

Zoology-Nematology

***Psammomermis colchicus* sp. n. (Nematoda: Mermithidae) from Kolcheti National Park (Georgia)**

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ABSTRACT. *Psammomermis colchicus* sp. n. (Nematoda: Mermithidae) was collected in Western Georgia from soil in a deciduous forest along the river Pichori. The new species differs from the early known species belonging to the genus *Psammomermis* sp. by the oblique position of the vagina in relation to the body axis and the structure and shape of the male tail. *Psammomermis colchicus* sp. n. in its structure is the closest to *P. nitidulensis*. © 2011 Bull. Georg. Natl. Acad. Sci.

Key words: *Psammomermis colchicus* sp. n., Nematoda, Mermithidae, pathogenic nematodes.

Nematodes of the genus *Psammomermis* are cosmopolitan. They are parasitic on Lepidoptera, Coleoptera and especially on representatives of the Scarabaeidae, eventually causing the death of the host [1-3]. Therefore representatives of this genus warrant consideration as biological control agents [4-7]. This genus is poorly known in Georgia. During the study of the soil mesofauna of Western Georgia, a new species of the genus *Psammomermis* was discovered [1]. Identification was based in part on amendments to the genus made by Poinar and Dowd [8].

Material and Methods. *Psammomermis colchicus* sp. n. (Fig. 1-4) together with other nematodes were collected in July 2010, from soil around alder trees (JPS coordinates; N=42°12'258, E=041°77'554) on the right bank of the river Pichori, in the Kolcheti National Park in Western Georgia. Among the various nematodes collected (Dorylaimidae, Rhabditidae, Tylenchidae) was 1 male and 1 female belonging to the genus *Psammomermis* (Mermithidae: Mermithides). The specimens that were taken from the soil and heat killed at 60°, fixed in TAF and processed to glycerin [9]. Drawings, pictures and measurements were made with MBI-3 microscope.

Measurements. *Female holotype* (n=1): L = 9.8 mm; a = 77.4; b = 2; V = 55.2; body diameter at cephalic papillae is 24 µm, nerve ring - 72 µm, vulva - 124 µm, end of trophosome - 64 µm; length of amphids is 6 µm, width - 4 µm; diameter of amphidial opening - 3.2 µm; distance from terminal end of head to nerve ring is 156 µm; trophosome is 226 µm; esophageal end is 4.6 µm; vulva - 5.3 µm; distance from the trophosome end to tail end - 26 µm; length of the whole vaginal canal - 72 µm; among them length of vagina vera - 26 µm; length of vagina uterina - 46 µm.

Male allotype (n=1): L = 4.7 mm; a = 62.6; b = 1.6; c = 69.1; body diameter at cephalic papillae is 19 µm, nerve ring is 56 µm, the maximum diameter - 78 µm; distance from terminal end of head to nerve ring - 164 µm; end of esophagus - 2.8 mm, trophosome - 374 µm, from trophosome end to tail - 165 µm; length of spicule - 200 µm; width at spicule tip - 11 µm, in the middle - 7 µm; length of amphids - 5 µm, width - 3.5 µm; diameter of amphidial opening - 2.5 µm; tail length - 34 µm; body width at cloacal opening - 44 µm; ratio of tail length to body width (cloacal opening) - 0.7.

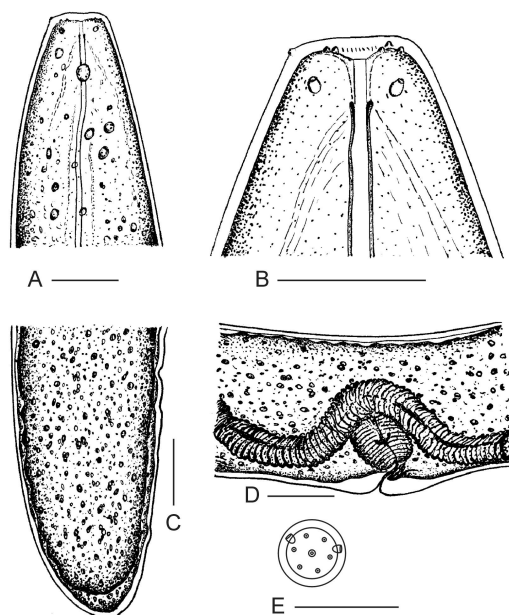


Fig. 1. *Psammomermis colchicus* sp. n.- female. A : Head, ventral view; B : Anterior part of the head under magnification; C : Tail; D : Vagina, lateral view; E : En face view (Scale bars : A,C,D,E = 50 μ m; B = 25 μ m).

Description. Narrow, small, white to yellow colored mermithid; body covered with thin cuticle; width of female cuticle at head and mid-body is 2 μ m; at tail - 3 μ m; cuticle width of male differs only at posterior end - 4 μ m; body cavity filled with trophosome containing granules; exterior surface of the cuticle covered with hardly noticeable, very fine cross fibers; anterior end of both female and male narrowed; apical end of the female truncated-blunt, that of male rounded-blunt; male tail short and conical in shape, female tail rounded; neck constriction noted only in male; terminal mouth opening, flask-shaped deepening at lips, 6 cephalic papillae arranged in a circle row; round, small, cup shaped, hardly noticeable amphids at a distance from cephalic papillae; vulva located post-equatorially; vagina shifted in relation to body axis; vulval lips more or less erect, female and male stoma erected, with thin walls; difference is only in size (length of female stoma - 9 μ m, width - 3 μ m; length of male stoma - 7 and with 2 μ m), 8 hypodermal cords at mid-body; trophosome begins after nerve ring, narrows at anterior part and extends almost to the end of body; vagina short, muscular and pot-shaped, shifted toward the body axis; composed of two parts: the first part that begins from the vulva opening is identified as vagina vera, but the part where the uterus branches begin - vagina uterina. These two parts are located to each other at an angle which is equal to approximately 90°.

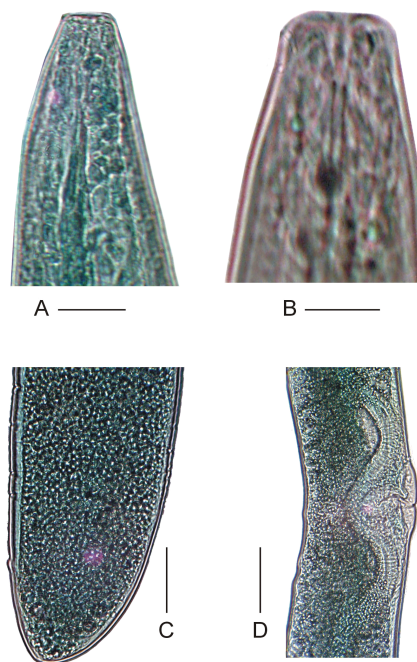


Fig. 2. *Psammomermis colchicus* sp. n. - female. A : Head, ventral view; B : Head, ventral view under high magnification; C : Tail; D : Vagina, lateral view (Scale bars : A, C, = 25 μ m; B = 13 μ m; D = 50 μ m).

Canal of vagina uterina is longer than that of vagina vera; in the middle vagina uterina has well defined sphincter; uterus wrinkled, pipe shaped and located parallel to the body; in male in the interior from cloacal opening to tail end possesses paired, cord-shaped, fused, bent cuticular branches; this picture on the whole creates an image of false bursal appendage of the nematode. Spicule of middle size, yellow in colour, possesses a hood; anterior part of spicule slightly bent, with conical end; two-thirds of the distal part are fused; precloacal and postcloacal papillae are unnoticeable.

Type material. 1 female (№ 2345) and 1 male (№ 2346) deposited in the scientific collection of the Institute of Zoology, Ilia State University.

Discussion. The main features by which the described species of *Psammomermis colchicus* sp. n. differs from previously described species of the genus are the shape and size of the spicules, comparative ratio of width and length of the male tail, the structure and shape of the male tail, position of the vagina in relation to the body axis. The described species differs from *P. busuluk* [10], *P. kulagini* [1], *P. sericestidis* [11] and *P. nitidulensis* [8] by a small size of spicula. Furthermore, *Psammomermis colchicus* sp. n. differs from the listed species (accept *P. nitidulensis*) by the oblique position of the vagina in relation to the body axis. By the structure, shape and

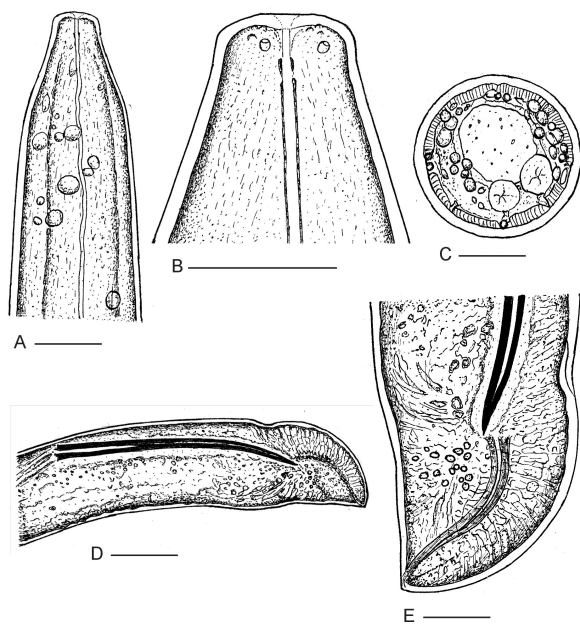


Fig. 3. *Psammomermis colchicus* sp. n. – male. A : Head, ventral view; B : Head, ventral view under high magnification; C : Cross section of mid-body; D : Lateral view, tail; E : Tail, lateral view under high magnification (Scale bars : A,B,C,E = 25 μ m; D = 50 μ m).

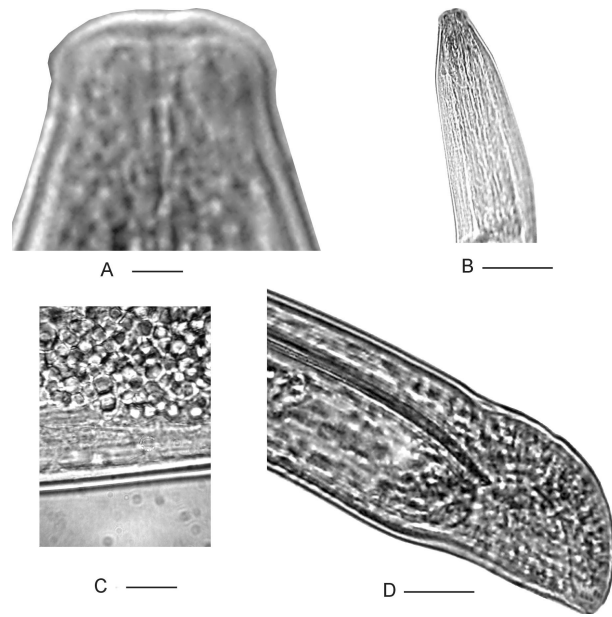


Fig. 4. *Psammomermis colchicus* sp. n. – male. A: Head, dorsal view under magnification; B: Head; C: Protein crystals of the body cavity; D : Tail, lateral view; (Scale bars: A = 10 μ m; B = 50 μ m; C,D = 25 μ m).

oblique location of vulva and vagina to the body axis *Psammomermis colchicus* sp. n. is closely related to that of *P. nitidulensis*. The new species differs from *P. nitidulensis*: by small body size (five times smaller than *P. nitidulensis*), shape and size of amphids (*P. nitidulensis* possess amphids of a large size-about 18 μ m), size and shape of spicules (spicule of *P. nitidulensis* is big-261 μ m and significantly bent); small size of the male tail and a small ratio of tail length to width (*P. nitidulensis* has tail three times longer, ratio of tail length to width = 2.6, *Psammomermis colchicus* sp. n. has accordingly = 0.7), structure of male tail and shape. Male of *P. nitidulensis* possesses a conical outgrowth which is not marked in *Psammomermis colchicus* sp. n. The main features by

which the described species of *Psammomermis colchicus* sp. n. differs from previously described species of the genus are the structure and shape of the male tail. The male of the new species in the middle of the tail from cloacal opening up to tail terminus has bent, cord-shaped, paired cuticular (fused at the end) branches, directed to the tail end.

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ზოოლოგია-ნემატოლოგია

Psammomermis colchicus sp. n. (Nematoda: Mermithidae) კოლხეთის ეროვნული პარკიდან (საქართველო)

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ნაშრომში მოცემულია დასავლეთ საქართველოში მოპოვებული ერთი მდედრი და ერთი მამრი მერმიტიდის გამოკვლევის შედეგები. მასპინძელი ცნობილი არ არის. მერმიტიდა სხეულის ანატომიურ-მორფოლოგიური აგებულების თვისებებებით მიეკუთვნება გვარ *Psammomermis*-ს. მთავარი ნიშანი, რითაც *Psammomermis colchicus* sp. n. გვარში აქამდე აღწერილი ყველა სხვა სახეობისაგან განსხვავდება, არის მამრის კუდის აგებულება და ფორმა. ახალი სახეობა მორფოლოგიური და ანატომიური ნიშნების მსგავსებით ყველაზე ახლოს დგას *Psammomermis nitidulensis* სახეობასთან.

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