

NEW SPECIES OF PLANT NEMATODES OF THE GENUS PRATYLENCHUS
IN ESTONIA

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In Estonia 3 species of nematodes of the genus Pratylenchus were observed which we considered to be new ones. One of these species was also found in the Leningrad region. The specimens used for this investigation were fixed in T.A.F. and hot formalin. Permanent preparations of the nematodes were made in glycerin according to standard methods, and also permanent preparations of the nematodes were stained with orcein according to the methods described by us earlier (Ryss, 1981). Cover edges of the slides were sealed with paraffin. Determination of the stage of the life cycle was carried out according to the structure and location of the genital primordium in the nematode body (Ryss, 1981). A detailed comparison of the morphology of larvae and sexually mature individuals of one of the species being described was carried out with specimens of species of the genus Pratylenchus fixed in T.A.F., from sub-cultures of the Rothamstead station (Great Britain). The fixed specimens were made available by Dr. A. R. Stone, for which the author expresses his gratitude. The type materials are kept in the collection of the Zoological Institute, USSR Academy of Sciences, in Leningrad.

A new coefficient e is introduced to describe the relation between the distance from posterior edge of metacorporeal bulb to end of the esophageal gland lobe, and the distance from posterior edge of metacorporeal bulb to oral opening. The coefficient b' is also used, describing the relation of overall body length to distance from oral opening to end of esophageal gland lobe (Loof, 1960).

Pratylenchus estoniensis sp. n.
(Fig. 1)

Holotype ♀. $L = 435 \mu\text{m}$, $a = 20$, $b = 5.6$, $b' = 4.1$, $c = 17$, $V = 82\%$, $e = 1.0$, stylet $16 \mu\text{m}$. Slide No. PT-00421.

Paratypes ♀♀ ($n = 11$). $L = 330-500 \mu\text{m}$, $a = 17-38$, $b = 4.6-7.6$, $b' = 3.5-5.5$, $c = 16-22$, $V = 79-86\%$, $e = 0.8-1.1$, stylet $15.5-17 \mu\text{m}$.

Description. Body short and thick. Labial area with two cuticular annules. Stylet knobs slightly pointed and directed forward. Anterior cephalid located at four annules; posterior cephalid, at eight cuticular annules behind the base of the cephalic capsule. Distance from posterior edge of the metacorporeal bulb to end of esophageal gland lobe usually equal to distance from posterior edge of bulb to oral opening. Vulva located in the posterior part of the trophic-genital section; post-uterine branch not containing rudimentary parts of the posterior branch of the gonad in the form of oogonia or somatic nuclei; its length not exceeding one and a half body diameters at vulva level. Spermatheca round, with an internal

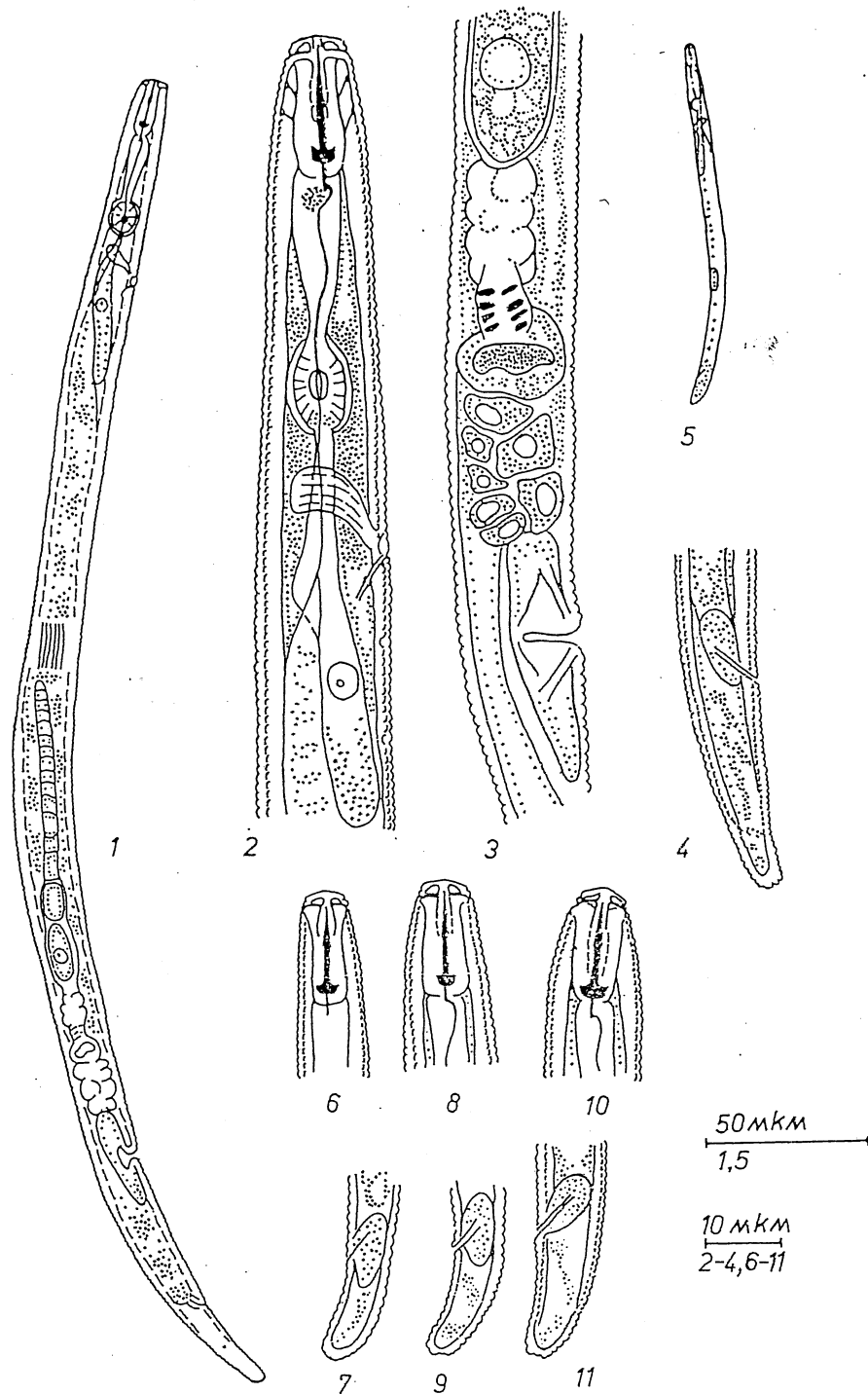


Figure 1. *Pratylenchus estoniensis* sp. n.

1-4 - Female; 1 - Overall view; 2 - Anterior end; 3 - Part of female gonad; 4 - Tail; 5 - Second stage larva; 6,7 - Head section and tail of second stage larva; 8, 9 - Head section and tail of third stage larva; 10, 11 - Head section and tail of fourth stage larva.

cavity, not containing sperms. 6 incisures in the lateral field, the two central ones sometimes represented by slanting lines. Tail tip serrated, 1.5-2 times as long as the anal diameter; 22-30 cuticular annules on ventral side of tail.

Males not observed; the species is represented exclusively by females and female larvae.

Differential diagnosis. There are two close species, also represented exclusively by females, with spermatheca devoid of sperms, vulvar coefficient "V" is not less than 79%, and with 6 incisures in the lateral field: these are P. neglectus and P. crenatus. However, in P. neglectus the tip is smooth, the number of annules on the ventral side of tail is 16-19; the spermatheca is not developed, it does not have an interior cavity, and it is fused together with the sphincter of the spermatheca in a common structure. Differences are observed also in the structure of different stages of the life cycle. The genital primordium in larvae of the second stage of P. neglectus is displaced in the posterior half of the trophic-genital section, but in the larvae of the second stage of P. estoniensis sp. n. and P. crenatus it is located in its center. In larvae of the second, third and fourth stages of P. neglectus, the tip is smooth, and in females the serration of the tip is observed only in rare instances. In P. crenatus the larvae of the third and succeeding stages of the life cycle, including the mature female, have a serrated tip. In P. estoniensis sp. n., there is already a serrated tip in larvae of the second stage and it is preserved on succeeding stages of the life cycle. The species being described is also close to P. crenatus by the number of annules on the ventral side of the tail and by the shape of the spermatheca (Seinhorst, 1968). The number of cuticular annules in the labial region is the only difference observed between P. crenatus and P. estoniensis sp. n. -- in P. crenatus there are three. The [two] head annules are an invariable criterion for P. estoniensis sp. n., and exist both in mature females and in larvae. The presence of three head annules for larvae and mature females of P. crenatus is also constant. This gives a basis for regarding P. crenatus and P. estoniensis sp. n. as close species. Their adaptation to soil structure speaks in support of such a point of view. P. crenatus in Europe is encountered in sandy soils (Loof, 1978), where P. estoniensis sp. n. was also observed; whereas P. neglectus is typical of heavy soils (Loof, 1978).

Type locality and type plant-host. The holotype was extracted from the roots of Rubus saxatilis, sampled near Vyiste in the Parnu region of the Estonian SSR on sandy soil in September 1980. The paratypes (11 females, 12 larvae) were extracted from the roots of Rubus saxatilis, Phleum pratense, and Calamagrostis epigeios, sampled on sandy soil at the same place and at the same time.

Pratylenchus kasari sp. n.
(Fig. 2)

Holotype ♀. L = 655 μm, a = 36, b = 6.0, b' = 3.8, c = 19, V = 75%, e = 1.3, stylet 17 μm. Slide No. PT-00400.

Paratypes ♀♀ (n = 14). L = 560-770 μ m, a = 32-44, b = 5.6-8.4, b' = 3.3-4.2, c = 16-20, V = 75-81%, e = 1.2-1.6, stylet 16-17.5 μ m.

♂♂ (n = 7). L = 570-700, a = 34-44, b = 5.7-7.3, b' = 3.5-4.3, c = 18-22, T = 47-67%, e = 1.2-1.4, stylet 16-17 μ m, spicules 20-21 μ m.

Description. Body slender, arrow-shaped and narrow. Stylet long and with rounded knobs, directed forward. Distance from opening of dorsal gland duct to basal part of the stylet 3.5-4 μ m. Labial area dome-shaped and with three cuticular annules. Anterior cephalid at 3-4 cuticular annules from the base of the cephalic capsule; posterior cephalid, at 8 annules. Esophagus lobe long. Hemizonid immediately in front of excretory pore, its length equal to the width of 3-4 cuticular annules. Hemizonion situated at 20-24 cuticular annules behind hemizonid, its length equal to the width of 1 cuticular annule. Spermatheca oval, its length (28-77 μ m), usually exceeds its width by 3-5 (sometimes 2) times, containing sperms 5 μ m in diameter. A rudiment of the posterior branch of the gonad with a group of 10-20 small nuclei is located behind the posterior uterine sac. Lateral fields with 4 incisures; in some specimens there is a broken fifth posterior line in the trophic-genital section. 4 (sometimes 2) incisures on tail. Tail length exceeding anal diameter by 3-4 times. Phasmids generally located in the anterior half of the tail. 32-44 cuticular annules (32 in the holotype) on ventral side of tail, not counting the terminal ones. Tip sharply conical and serrated. Sexual dimorphism not expressed. Spicule shape typical for pratylenchids but they are very large.

Differential diagnosis. The species is closest ecologically and morphologically to P. pratensis from which it differs by the longer stylet, (14-15 μ m in P. pratensis), by the value of the coefficient e (in P. pratensis according to the illustrations e = 1), by the very elongated spermatheca, by the presence of a rudimentary posterior branch of the gonad behind the posterior uterine sac, by the large number of cuticular annules on the ventral side of the tail (20-28 in P. pratensis), by the sharply conical tip, and by the longer spicules (17-19 μ m in P. pratensis).

Type locality and type plant-host. The holotype was extracted from the roots of tufted hair-grass Deschampsia caespitosa near the village of Pechkovo on the bank of the Rydenka River in the Luuga region of the Leningrad district in September 1980. The paratypes (49 females, 4 males and 10 larvae), were obtained on the site of the holotype and at the same time, but also were extracted from roots of the same plant-host in the floodlands of the River Kasari near the settlement of Peniye on the territory of the Matsalu reserve of the Estonian SSR in September 1980 (6 females and 3 males). In ordinary circumstances the nematodes are extracted from the roots of plants gathered at the edge of water and depressions of relief on a damp, somewhat marsh-ridden section of floodplain meadow characterized by loamy soil.

The species was named for the location of its first discovery in the soil of the River Kasari (Estonian SSR, territory of the Matsalu reserve).

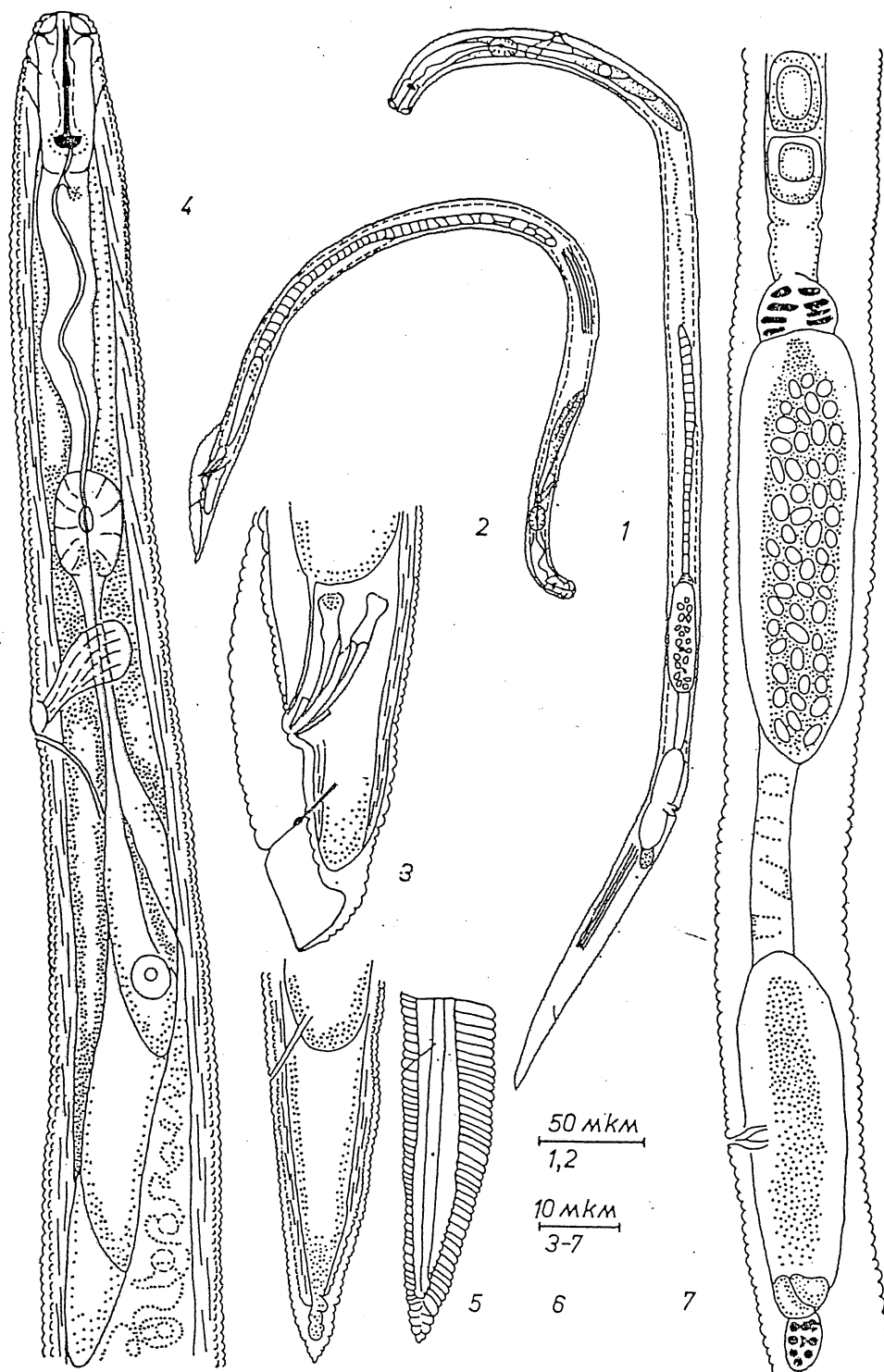


Figure 2. *Pratylenchus kasari* sp. n.

1 - Female; 2 - Male; 3 - Tail section of male; 4 - Female anterior end;
5, 6 - Female tails; 7 - Part of female gonad.

Pratylenchus kralli sp. n.
(Fig. 3)

Holotype ♀. L = 410 μ m, a = 24, b = 5.8, b' = 4.4, c = 20, V = 76%, e = 0.9, stylet 14 μ m. Slide No. PT-00427.

Paratypes ♀♀ (n = 18). L = 400-500 μ m, a = 20-33, b = 4.8-6.5, b' = 3.9-4.5, c = 17-23, V = 74-80%, e = 0.8-1.1, stylet 14-15 μ m.

♂♂ (n = 10). L = 380-450 μ m, a = 21-34, b = 5.2-6.4, b' = 3.9-6.5, c = 16-23, T = 41-54%, stylet 12.5-14 μ m, spicules 14-15.5 μ m.

Description. Body narrow and slender. Labial area dome-shaped, tall, with three cuticular annules. Stylet small and with wide knobs forwardly directed. Distance from opening of dorsal gland duct to basal part of the stylet 2 μ m. Metacorpul bulb round. Esophagus lobe narrow. Spermatheca round, or sometimes slightly oval; with a diameter of 14-17 μ m, and filled with small spermatozooids 2 μ m in diameter. Length of posterior branch of uterus exceeding the body width at vulva level by more than 1.5 times, not containing oogonia. Occasionally behind the posterior uterine sac is observed a rudiment of the posterior branch of the gonad with several small pyknotic nuclei which, however, are not nuclei of oogonia but are somatic nuclei. 4 incisures in the lateral field. Tail length exceeding the anal diameter by 2 times. 16-23 annules of cuticle on the ventral side of the tail. Tip smooth, pointed and cut slightly short in the direction of the ventral side of the body. Serration observed in rare instances in the tip region. Male stylet somewhat shorter than female stylet. Spicule shape typical for pratylenchids, small.

Differential diagnosis. The species is close to P. penetrans and P. vulnus. It differs from P. penetrans by the smaller stylet length (15-17 μ m in P. penetrans), by the position of the vulva (V = 77-83% in P. penetrans), and the shape of the tip is smooth but not sharp in P. penetrans. It is distinguished from P. vulnus by the smaller body length (460-740 μ m in P. vulnus), by the fact that in P. kralli sp. n. there are invariably 3 annules of cuticle in the labial area (3 or 4 in P. vulnus), by the shape of the metacorpul bulb (oval in P. vulnus), and by the shape of the spermatheca (always oval in P. vulnus). Besides this, in P. vulnus there are oocytes in the posterior branch of the gonad, and the latter exceeds the body width at level of vulva by 2-3 times, while there are 22-28 cuticular annules on the ventral side of the tail.

Type locality and type plant-host. The holotype and paratypes (50 females, 20 males and 20 larvae), were extracted by E. L. Krall' from the roots of black currant in the city of Parnu (Papiniidus region) in August 1963.

The species is named in honor of E. L. Krall', station scientific collaborator of the Institute of Zoology and Botany, Estonian SSR Academy of Sciences.

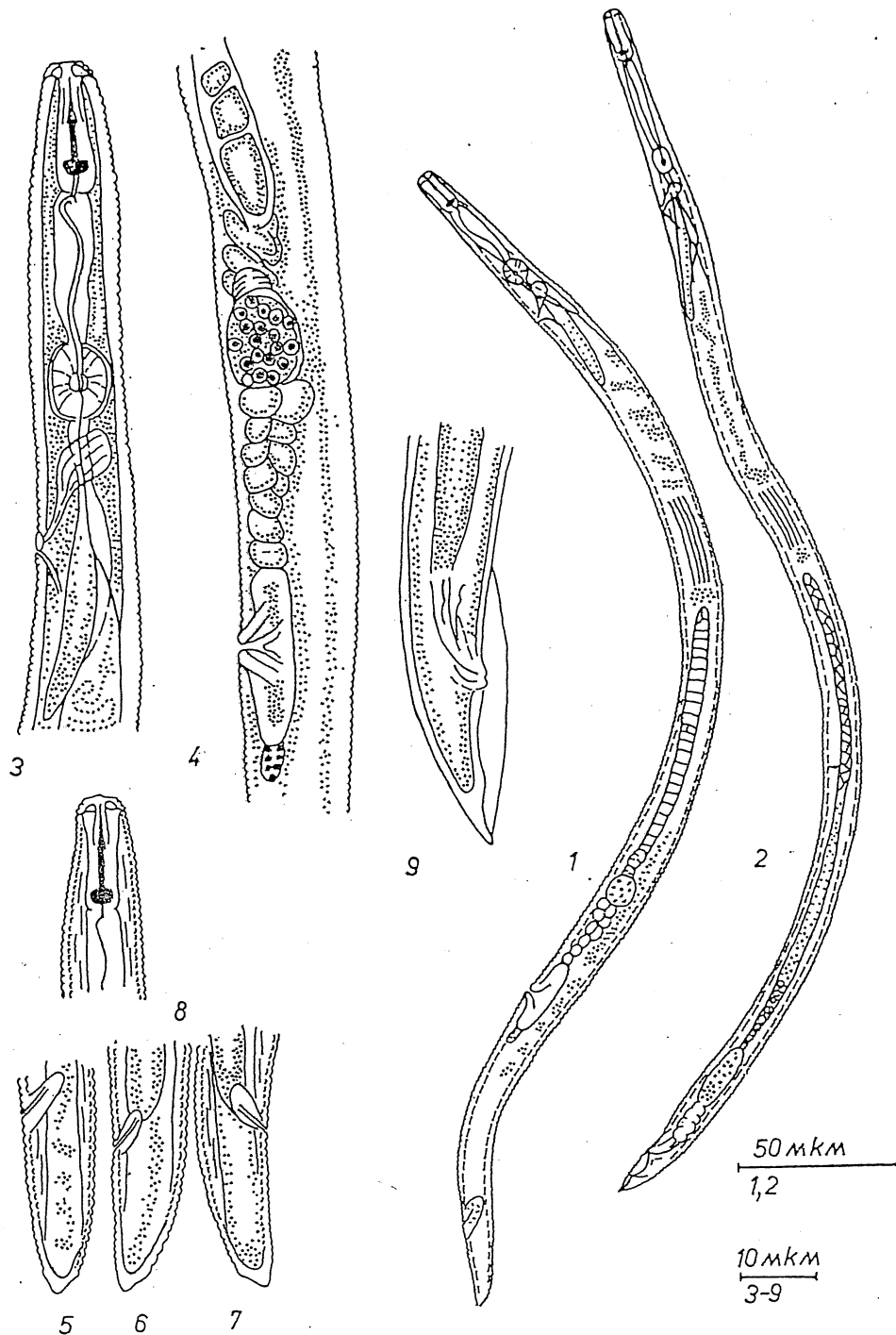


Figure 3. *Pratylenchus kralli* sp. n.

1 - Female; 2 - Male; 3 - Anterior end of female; 4 - Part of female gonad; 5, 6, 7 - Female tails; 8 - Anterior end of body of male; 9 - Tail end of body of male.

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NEW PHYTONEMATODE SPECIES OF THE GENUS PRATYLENCHUS IN ESTONIA

Descriptions of 3 new species of the genus Pratylenchus are presented. P. estoniensis sp. n. differs from P. neglectus by the crenate terminus, the number of tail annules (in P. estoniensis sp. n. 22-30, in P. neglectus 16-19) and by the shape of spermatheca (in P. neglectus the spermatheca and the sphincter of the spermatheca are in the form of a compact body, almost without internal cavity, in P. estoniensis sp. n. spermatheca round, with a cavity and without spermatozooids). In second-stage larva of P. neglectus the gonad primordium is located on the posterior half of the trophico-genital region, and in P. estoniensis sp. n. in the central part. The new species differs from P. crenatus by 2 lip annules in females and larvae. As P. crenatus, the new species, occurs in sandy soil. Males have not been found.

P. kasari sp. n. is close to P. pratensis, it differs from the latter by the length of the spear (16-17.5 μ m, in P. pratensis 14-15 μ m), the number of tail annules (32-44, in P. pratensis 20-28), the relation of the distance from the posterior edge of metacarpus to the end of the esophageal gland lobe — to the distance from the posterior edge of metacarpus to the lip region (new coefficient e : 1.2-1.6 in P. kasari sp. n., in P. pratensis $e=1$), by the very long spermatheca (length 3-5 times more than width), presence of the rudiment of the posterior gonad, the narrow, conoid, crenate terminus and by longer spicules (20-21 μ m, in P. pratensis 17-19 μ m). The new species has been found on the moist, slightly marshy part of the inundation valley meadow in clayey soil.

P. kralli sp. n. differs from P. penetrans by the length of the spear (14-15 μ m, in P. penetrans 15-17 μ m), the vulva position ($V=74-80\%$, in P. penetrans 77-83%), the shape of terminus (the terminus of P. kralli sp. n. smooth, narrow, subacute). The new species differs from P. vulnus by the length of the body (400-500 μ m, in P. vulnus 460-740 μ m), the constant presence of 3 lip annules (in P. vulnus 3 or 4), the round metacarpus (in P. vulnus — oval), round spermatheca (in P. vulnus — oval), absence of oocytes in the posterior uterine branch, by its short length (not more than 1.5 body width at vulva) and the number of tail annules (16-23, in P. vulnus 20-28). P. kralli sp. n. has been found in roots of black currant in the garden.