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A new species of the genus Aktedrilus (Oligochaeta, Tubificidae) of the littoral zone of the sea of Japan

by

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A New Species of the Genus Aktedrilus (Oligochaeta, Tubificidae) of the Littoral Zone of the Sea of Japan (Novyi vid Aktedrilus (Oligochaeta, Tubificidae) litorali yaponskogo morya)

by N.P. Finogenova, N.M. Shurova

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A description is given of Aktedrilus longitubularis sp. n., found in the Vostok Bay area in the littoral zone of the Sea of Japan. /65* The basic diagnostic features of this species are a long, curved penial tube, a massive anterior prostate, and subdivision of the atrium into glandular and muscular sections.

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* Translator's note. Page number in the Russian original.

A new member of the genus Aktedrilus can often be found in the sand and stone bottom of the littoral zone of Vostok Bay in the Sea of Japan.

Aktedrilus longitubularis Finogenova and Shurova, sp.n.

The cephalic lobe is round and has short sense hairs which can be easily seen on live specimens. There are separate bundles of sense hairs on several anterior segments. The hairs become deformed when fixed. There are granular cells (like those of Aktedrilus monospermathecus) in the epithelium of the cephalic lobe. Some of the anterior segments have two rings, the first narrower than the second. The setae are bidentate only, bent in a ζ-shape*, and the upper denticle is shorter and finer. The nodulus is weakly expressed, situated at a distance of about 1/3 from the distal end (Figure 1). The number of setae per bundle is 3-4 in the anterior segments (rarely 2-6), 3 behind the clitellum (rarely 2-4), and 2-3 in the posterior part of the body. There are no ventral setae in segment XI. Setae are 41-45 microns long. There are no big cavernous bodies**. Chloragogen tissue extends from segment VI. Segments IV-VI contain the septal glands. The nephridia are compact, with slightly looping nephridial tubes (Figure 2), and in mature specimens they appear on all segments except the first six or seven and the tenth and eleventh; nephridia may be absent from other segments as well in juvenile specimens. The brain has a deep notch at the rear.

Translator's notes: * Possibly S-shaped, since the Russian (Cyrillic) alphabet has no letter S.
** Literal rendering.

The clitellum is on segments 1/2 X to XII. The male genital openings are in segment XI in line with the ventral setae. The pore of the only spermatheca is on the dorsal side in the median line near intersegmental septum 9/10 in segment X. A large pair of testes is fixed to intersegmental septum 9/10 in segment X, a pair of ovaries to intersegmental septum 10/11 in segment XI. The vas deferens leads into the atrium apically. The atrium is tubular and made up of two sections: a wider one, which has glandular tissue, and a narrower one, which is non-glandular, but has a muscle wall (Figures 3, 6).

The vas deferens and the atrium are lined on the inside with ciliary epithelium.

/66

Figure 1 - Seta of segment XVII.

Figure 2 - Nephridium of segment VIII (fixed).

The vas deferens is somewhat longer than the atrium. The atrium merges into a bulky penis with a long, curved penial tube, the ectal end of which is located obliquely to the efferent aperture (Figures 4, 5).

There are two prostates: one opens into the non-glandular section of the atrium, is very large, leads towards the sperm funnel, and fills most of the lower half of the segment; the vas deferens is nearly completely buried in it and only small sections of the margin are not enclosed by it (Figures 3, 6): the second prostate (or pseudoprostate?), on the other hand, is very small, and opens up near /67 the ectal end of the penial tube (Figures 3, 7).

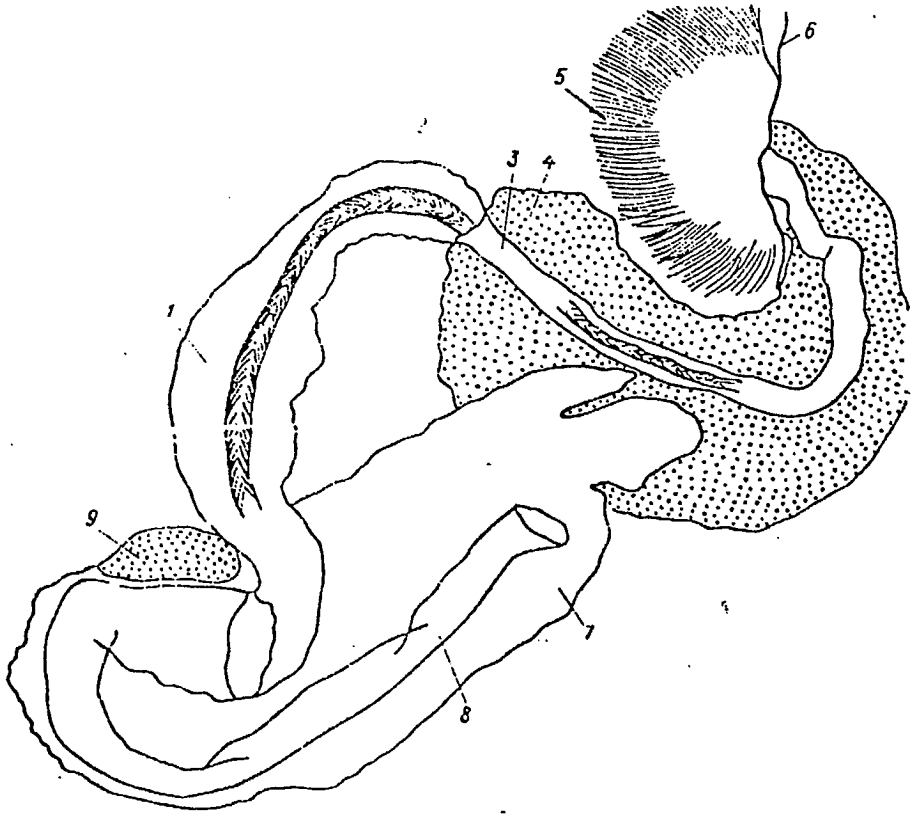

Figure 3
The male gonoduct (fixed, penial tube altered). 1 - glandular section of atrium, 2 - muscular section of atrium, 3 - vas deferens, 4 - anterior prostate, 5 - sperm funnel, 6 - intersegmental septum, 7 - bulb of the penis, 8 - penial tube, 9 - posterior prostate.

Figure 4
Microscopic section of the area of the opening of the anterior prostate into the atrium. 1 - ovary, 2 - anterior prostate, 3 - muscles of the atrium, 4 - epithelium of the atrium, 5 - bulb of the penis, 6 - penial tube, 7 - vas deferens.

The dimensions of the gonoduct parts are as follows: vas deferens - length, 160 microns, thickness at sperm funnel 7 microns, thickness at the opening into the atrium 6.6 microns. Muscular section of the atrium - length 50 microns, thickness 14.3 microns, width of the lumen 3.3 microns. Penial tube - length 165 microns (in the other specimen 180 microns), diameter in proximal part 11-16.5 microns, in distal part 9.9-12.7 microns, in central part 6.6-7.7 microns. The ampulla of the spermatheca is oblong. The efferent duct of the spermatheca is thick, and it is not marked off from the ampulla (Figure 8).

The length of the spermatheca (fixed) is 140 microns, the width of the ampulla 30 microns, and that of the efferent duct 27.5-32.5 microns. The sperm does not form spermatozeugmata. There are

anterior and posterior sperm sacs. The anterior sperm sac may extend to segment VIII, and the posterior one may extend to segment XVI.

The body length of a mature worm is 2-3.5 mm, the thickness in the area of the clitellum is 190-210 microns, and the number of segments is 28-39.

Mature specimens with clearly delineated clitella are encountered in June and July. The construction of the cocoon also takes place at this time. The cocoon is round in shape, 0.5-0.6 mm in diameter, and covered by a transparent, viscous shell. It is deposited directly in the bottom and immediately becomes coated all over with sand. There are from 1 to 3 eggs in each cocoon. The eggs are 0.15-0.20 mm in diameter. Each worm deposits cocoons repeatedly, at intervals of 7-10 days as the eggs mature. After they have deposited the cocoons, only a few of the worms die, while the majority undergo a reduction of the reproductive system.

The young leave the cocoons after 20-21 days, having a length of 2.0-2.5 mm, a maximum width of 0.18 mm, and 24-25 segments. Their /68 setae have the same form as the adults. The dorsal and ventral bundles usually contain 3 setae, or more rarely 2. In the last segments, however, the bundles contain only one seta each.

Location: Vostok Bay, in Peter the Great Bay, in the Sea of Japan, biological research station of the Far Eastern Scientific Research Centre of the USSR Academy of Sciences (around the Hydrobiological Laboratory and near the shipyard), the upper and middle levels of the littoral zone, clean and silted sand with stones.

Holotype No. 1/43768 and paratype No. 2/43769 (collected in June 1978) are kept in the collection of the Zoological Institute of the Academy of Sciences of the USSR.

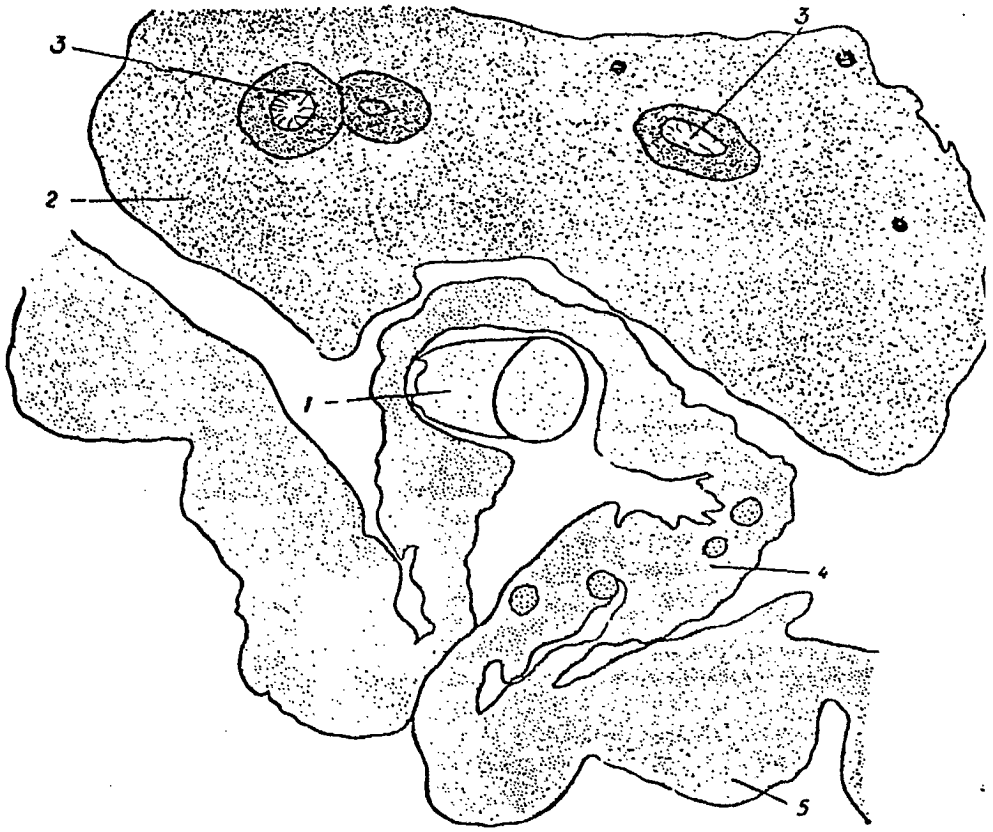

Figure 5
Microscopic section in the area of the ectal section of the penial tube. 1 - ectal section of the penial tube, 2 - anterior prostate, 3 - vas deferens, 4 - penial bulb, 5 - body wall.

The new species has much in common, both externally and internally, with two well-known species of this genus - A. monospermathecus (Knollner, 1935) and A. svetlovi (Finogenova, 1976). It resembles A. monospermathecus in the presence of sensory setae on the cephalic lobe, the granular cells in the epithelium of this organ, the biannularity of the anterior segments, the form and length of the setae and number per bundle, the point of origin and shape of the nephridia, the proportions of the male gonoduct, and the shape of the spermatheca. It is morphologically similar to A. svetlovi in the

biannularity of the anterior segments, the form of the setae, the point of origin of the nephridia, the proportions of the male gonoduct, the presence of the thin, curved penial tube, the form of the spermatheca, and the dimensions of the body. The basic differences between it and A. monospermathecus are the following: the upper denticle of the seta in A. longitubularis is longer; it has a greater number of nephridia (A. monospermathecus has only 5 pairs); its atrium is thicker (only 16- /69
17 microns in A. monospermathecus); its atrium is divided into two sections (not in the case in A. monospermathecus); it has a curved penial tube (while A. monospermathecus has a bent cuticular penial lining); the anterior prostate is more massive; its spermatheca is bigger (100 microns long in A. monospermathecus); and the new species is smaller (body-length of A. monospermathecus is 3-8 mm). Our new-found species differs from A. svetlovi in a number of ways: in the number of setae in each bundle (A. svetlovi has 4-7 setae in anterior bundles, 4-5 in posterior ones) and their length (A. svetlovi's are bigger), in the number of nephridia (A. svetlovi has fewer nephridia), the structure of the atrium (that of A. svetlovi is not divided into two sections), the size of the prostates (A. svetlovi's anterior prostate is smaller, and its posterior one larger, than in A. longitubularis), the size of the penial tube (A. svetlovi's is shorter and less curved than that of A. longitubularis), and of the spermatheca (A. svetlovi's is longer).

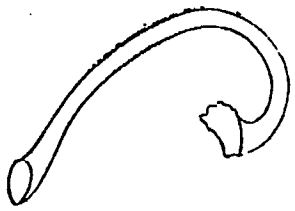

Figure 6
The penial tube (fixed).

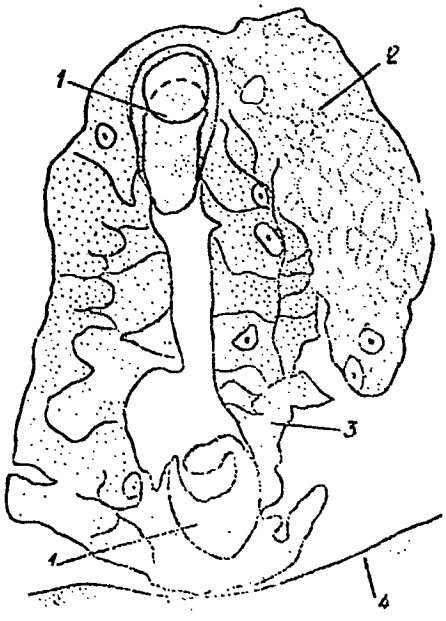

Figure 7
Microscopic section of the entrance area of the posterior prostate.
1 - penial tube, 2 - posterior prostate, 3 - bulb of the penis,
4 - body wall.

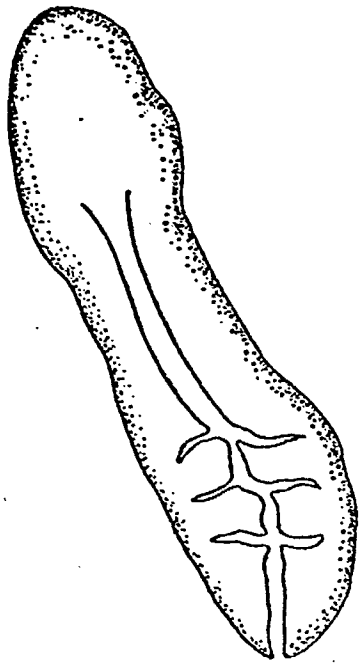

Figure 8
Spermatheca (fixed).

References

Finogenova N.P. New species of tubificid Oligochaeta from the Caspian Sea. - Zool. zh., 1976, Vol. 55, No. 10, pp. 1563-1566.

Knöllner F.H. Ecological and systematic investigations of the littoral and marine Oligochaeta of the Kieler Bucht. - Zool. Z., Abt. Syst., 1935, No. 66, pp. 425-512.

ЛИТЕРАТУРА

Финогенова Н. П. Новые виды малощетинковых червей семейства Tubificidae из Каспийского моря. — Зоол. ж., 1976, т. 55, вып. 10, с. 1563—1566.
Knöllner F. H. Ökologische und systematische Untersuchungen über litorale und marine Oligohaeten der Kieler Bucht. — Zool. Z., Abt. Syst., 1935, Bd 66, p.425—512.