

A NEW SPECIES OF *STYLOSCOLEX* MICHAELSEN (*OLIGOCHAETA*, *LUMBRICULIDAE*) FROM THE MAGADAN REGION, RUSSIA

Tarmo TIMM

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Abstract. A new oligochaete species *Styloscolex tubulatus* sp. n. is described from the basin of upper reaches of the Kolyma River. It belongs to the nominotypical subgenus *Styloscolex* and differs from all congeners by having a pair of tubular bent, heavily muscular atria, as well as two pairs of spermathecae: one pair in the ovarian and the other pair in the first postovarial segment.

Key words: *Oligochaeta*, *Lumbriculidae*, new species, Far East.

INTRODUCTION

Styloscolex Michaelsen, 1901 is a mostly north-east Asian genus of the cool-water oligochaete family *Lumbriculidae*. Its distribution range stretches from Lake Baikal (Изосимов 1962, et al.) and north-east China (Yamaguchi 1940) to the western part of Alaska Peninsula in North America (Holmquist 1974) (Fig. 1). 13 species have been described so far: *S. asymmetricus* Isosimov, 1962 (Lake Baikal and reservoirs on its outflow — Изосимов 1962; Акиншина, Томилов 1976), the type species *S. baicalensis* Michaelsen, 1901 (Lake Baikal), *S. chorioidalis* Isosimov, 1962 (Lake Baikal — Изосимов 1962), *S. distinctus* Morev, 1984 (Magadan Region — Морев 1984), *S. japonicus* Yamaguchi, 1937 (Hokkaido Island), *S. kolmakovi* Burow, 1931 (Lake Baikal — Буrow 1931), *S. levanidovi* Sokolskaja, 1977 (originally as *Eclipidrilus levanidovi*; Chukchi Peninsula — Сокольская 1977, 1983b), *S. macer* Sokolskaja, 1976 (Chukchi Peninsula — Сокольская 1976, 1983b), *S. opisthothecus* Sokolskaja, 1969 (Kamtschatka and Alaska Peninsulæ — Сокольская 1969, 1972, 1978, 1983a; Holmquist 1974), *S. sokolskajae* Morev, 1978 (Chukchi Peninsula — Морев 1978), *S. solzanicus* Hrabě, 1982 (Lake Baikal), *S. swarczewskii* Burow, 1931 (Lake Baikal — Буrow 1931), and *S. tetrathecus* Burow, 1931 (Lake Baikal, Manchuria, Magadan Region, Koryak Mountains — Буrow 1931; Yamaguchi 1940; Морев 1983a, 1983b; Морев et al. 1985; Сокольская 1978, 1983a).

Simple-pointed setae, relatively anterior position of the whole reproductive system (with testes, atria and male pores in VIII, VIII—IX, or VII), elongate atria with vasa deferentia falling into their distal part, and

especially the well-formed, often stiff penes enclosed in penial sacs are the main diagnostic characters of the genus. Moreover, in the nominotypical subgenus the testicular and the ovarian segment are always separated by an intercalary sterile segment — a unique character in the family *Lumbriculidae*. Four species with soft penes and this intercalary segment devoid are united into subgenus *Neoscolex* Sokolskaja, 1976 (*S. distinctus*, *S. levanidovi*, the type species *S. macer*, and *S. sokolskajae*; Сокольская 1983a, Моев 1984). In one species with extremely variable reproductive system, *S. solzanicus* the intercalary segment is normally present but sometimes lacking while the penis is soft like in *Neoscolex* (Hrabě 1982).

In this paper, the fourteenth species of the genus belonging to the nominotypical subgenus *Styloscolex* will be described.

MATERIAL AND METHODS

The River Kulu is one of the sources of the large Kolyma River falling into the Arctic Ocean. The village Kulu is situated on the bank of this river in the mountainous part of the Magadan Region, about 62°N and 147°E (Fig. 1). Construction of a hydropower reservoir on the upper reaches of the Kolyma River in 1980s stimulated scientific investigations in this district (Моев et al. 1985). A formalin-preserved sample of oligochaetes labelled as (in translation from Russian) «Magadan Region, settlement Kulu, research spot Kontakt, the Oligokhetny Stream, 9 June 1983, sample 3» was sent me by Dr. Tatyana S. Vshivkova, Far-East Scientific Centre, Vladivostok. The sample included 42 specimens of a new lumbriculid species, 11 of them being sexually mature and three enchytraeid specimens (the latter not treated in this paper). Unfortunately, no more data on the sampling site are available. 5 of the mature lumbriculids were studied as 5 µm thick serial microtome sections, the rest as whole mounts in glycerine or Canada balsam. The type material is maintained at the Võrtsjärv Limnological Station (VLS), Rannu, Estonia.



Fig. 1. Distribution range of the genus *Styloscolex*. Dots correspond to the separate finding places; that of *S. tubulatus* is indicated by an arrow.

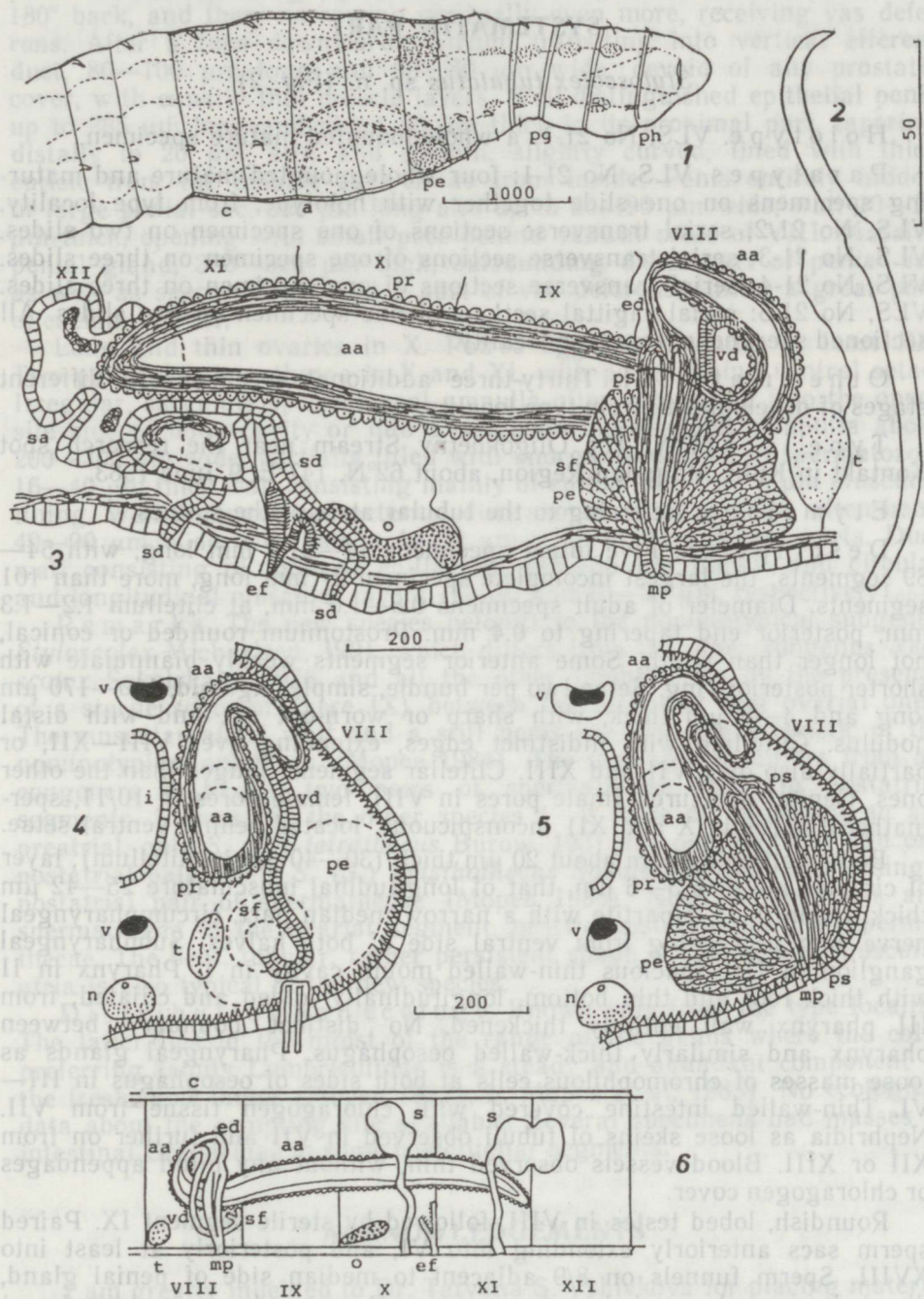


Fig. 2. *Styloscolex tubulatus* sp. n. 1 — anterior end and genital segments of the holotype. 2 — seta. 3 — reconstruction of the reproductive system from sagittal sections. 4 and 5 — reconstructions of the different elements of male efferent ducts from transverse sections. 6 — diagrammatic scheme of reproductive apparatus, all elements paired. a — atrium, aa — atrial ampulla, c — clitellum, ed — ejaculatory duct, ef — egg funnel, i — intestine, mp — male pore, n — nerve cord, o — ovary, pe — penial gland, pg — pharyngeal glands, ph — pharynx, pr — prostatic gland tissue, ps — penial sac with penis, s — spermatheca, sa — spermathecal ampulla, sd — spermathecal duct, sf — sperm funnel, t — testis, v — dorsal and ventral blood vessels, vd — vas deferens, VIII—XII — numbers of the segments. Scale bars in μm .

SYSTEMATIC PART

Styloscolex tubulatus sp. n. (Fig. 2)

Holotype. VLS, No 21-1: a whole-mounted mature specimen.

Paratypes. VLS, No 21-1: four whole-mounted mature and maturing specimens on one slide together with holotype, from type locality. VLS, No 21-2: serial transverse sections of one specimen on two slides. VLS, No 21-3: serial transverse sections of one specimen on three slides. VLS, No 21-4: serial transverse sections of one specimen on three slides. VLS, No 21-5: serial sagittal sections of one specimen on two slides. All sectioned specimens from type locality.

Other material. Thirty-three additional specimens in different stages of development, from type locality.

Type locality. The Oligokhetny Stream near the research spot Kontakt in Kulu, Magadan Region, about 62°N, 147°E, 9 June 1983.

Etymology. Referring to the tubular atria of the species.

Description. Five intact specimens 14–21.5 mm long, with 54–89 segments; the largest incomplete specimen 27 mm long, more than 101 segments. Diameter of adult specimens 0.8–1.0 mm, at clitellum 1.2–1.3 mm, posterior end tapering to 0.4 mm. Prostomium rounded or conical, not longer than width. Some anterior segments weakly biannulate with shorter posterior ring. Setae two per bundle, simple, sigmoid, 110–170 μm long and 4–8 μm thick, with sharp or worn-out tip, and with distal nodulus. Clitellum with indistinct edges, extending over VIII–XII, or partially also over VII and XIII. Clitellar segments longer than the other ones. Genital apertures (male pores in VIII, female pores in 10/11, spermathecal pores in X and XI) inconspicuous, located behind ventral setae.

Body wall epithelium about 20 μm thick (30–40 μm in clitellum), layer of circular muscles 3–6 μm , that of longitudinal musculature 25–42 μm thick. Brain in II, bipartite with a narrow median part, circumpharyngeal nerve ring proceeding from ventral side of both halves. Subpharyngeal ganglion in III. Spacious thin-walled mouth cavity in I. Pharynx in II with thick roof and thin bottom, longitudinally folded and ciliated; from III pharynx wall entirely thickened. No distinct boundary between pharynx and similarly thick-walled oesophagus. Pharyngeal glands as loose masses of chromophilous cells at both sides of oesophagus in III–VI. Thin-walled intestine covered with chloragogen tissue from VII. Nephridia as loose skeins of tubuli observed in VII and further on from XII or XIII. Blood vessels observed thin, without any blind appendages or chloragogen cover.

Roundish, lobed testes in VIII, followed by sterile segment IX. Paired sperm sacs anteriorly extending into VI, and posteriorly at least into XVIII. Sperm funnels on 8/9 adjacent to median side of penial gland, directed forwards or (when in sperm sac) upwards or backwards, at least 275–390 μm wide. Vasa deferentia 30–40 μm wide, their lumen 6–8 μm . They ascend almost straight along the surface of penial gland, pass efferent duct anteriorly and join the distal, bent portion of atria, proceeding some distance towards proximal part of atria between muscular layers. A pair of very long atria located in VIII to X or XI. Atrial ampulla stiff, tubular, banana-like, about 1500 μm long, up to 240–310 μm wide, tapering at both ends. Empty central lumen lined with very thin epithelium (1–4 μm), followed by dense layers of circular (1–4 μm) and longitudinal musculature (20–40 μm); and then by a 6–30 μm thick layer of prostate cells covering atria from outside. Distal (anterior)

part of atrium pushing against 7/8, narrowing to 100—150 μm , turning 180° back, and then, narrowing gradually even more, receiving vas deferens. After a turn downwards, atrium transiting into vertical efferent duct, 80—100 μm long and 35—80 μm wide, devoid of any prostatic cover, with equally thin muscle layers. Well-distinguished epithelial penis up to 285 μm long and about 50 μm thick in its proximal part, tapering distally to 20 μm , stiff and smooth, slightly curved, lined with thick cuticle from the outside as well as from inside. Penis entirely hidden in large penial sac, 500 μm long and up to 60—90 μm wide, wall 10—20 μm thick, opening with small pore behind ventral setae of VIII. Massive penial gland, 300—500 μm high, surrounding distal part of penial sac as well as sperm funnel and a part of vas deferens, filling a great part of coelom in VIII.

Long and thin ovaries in X. Paired egg sac reaching at least XX. Two pairs of spermathecae in X and XI, with pores behind ventral setae. Irregular, sacculate spermathecal ampulla often protruding into the opposite side of body cavity or into a neighbouring segment. Ampulla about 200—300 μm wide, partially filled with unorganized mass of spermatozoa, 16—40 μm thick wall consisting mainly of epithelium, with 3 μm muscular lining. Well-distinguished external duct shorter than ampulla, often bent, 40—90 μm wide, with lumen 1—20 μm wide in its different parts. Duct wall consisting of internal epithelium (13—35 μm thick), and circular and longitudinal muscular layers (4—10 and 10—25 μm , respectively).

Remarks. The new species belongs to the nominotypical subgenus *Styloscolex* Michaelsen, 1901, which differs from the other subgenus *Neoscolex* Sokolskaja, 1976 and all the other lumbriculids by the presence of a sterile segment (here IX) between the testicular and ovarian ones. The muscular atrial wall and a stiff penis are also characteristic of the nominotypical subgenus (Модев 1984). The new species differs from all congeners by having two pairs of spermathecae, both in postatrial segments. In most of the other species 1—2 pairs of spermathecae are preatrial, only *S. (S.) tetrathecus* Burow, 1931 has one preatrial and one postatrial pair, while *S. (S.) opisthotheus* Sokolskaja, 1969 has a single postatrial pair of spermathecae (Модев 1984). None of them has any spermathecae in the ovarian segment, or two posterior pairs of spermathecae. The bent, tubular, rather persistent shape of the heavily muscular atria is also typical of the new species.

Distribution and ecology. Known only from the type locality. The latter lies in the midst of the range of the genus where the cold-preferring family Lumbriculidae is a steady and abundant component of the freshwater fauna (Модев 1983a, b; Модев et al. 1985). No ecological data about the sampling site available. Several specimens had masses of intestinal Gregarinae in some postclitellar segments.

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PEREKONNA *STYLOSCOLEX* MICHAELSEN UUS LIIK
(*OLIGOCHAETA*, *LUMBRICULIDAE*) MAGADANI OBLASTIST
VENEMAALT

Tarmo TIMM

On kirjeldatud uut liiki *Styloscolex tubulatus* sp. n. ühest ojast Kulu ligidal Kolõma jõe ülemjooksul. Liik kuulub perekonna *Styloscolex* nominaatsesse alamperkonda, mida iseloomustavad sissetõmmatav jäigas kestat peenis ning isas- ja emassugunäärmeid eraldav steriilne segment. Uus liik erineb perekonna teistest liikmetest väga pikkade ja lihaseliste torujate aatriumide ning kahe paari seemnehoidlate poolest, millest üks paar asub munasarjadega samas segmentis ja teine kohe järgnevas.

НОВЫЙ ВИД РОДА *STYLOSCOLEX* MICHAELSEN (*OLIGOCHAETA*,
LUMBRICULIDAE) ИЗ МАГАДАНСКОЙ ОБЛАСТИ

Тармо ТИММ

Описывается новый вид, найденный в ручье в окрестностях Кулу на верховьях реки Колымы. Он принадлежит к номинатному подроду рода *Styloscolex*, характеризующемуся втяжным пенисом в жесткой обкладке и стерильным сегментом между мужскими и женскими половыми железами. Новый вид отличается от остальных весьма длинными, мускулистыми трубчатыми астриями, а также наличием двух пар семеприемников — в овариальном и последующем сегменте.