ALGAE — ВОДОРОСЛИ

Stauroneis guslyakovii sp. nov. (*Bacillariophyta*) from water bodies in the Far North of Western Siberia, Russia

S. I. Genkal[1], M. I. Yarushina[2]

[1] Institute for Biology of Inland Waters RAS, Borok, Russia
[2] Institute of Plant and Animal Ecology, Ural Branch RAS, Yekaterinburg, Russia
Corresponding author: S. I. Genkal, genkal@ibiw.yaroslavl.ru

Abstract. A new planktonic pennate diatom species, *Stauroneis guslyakovii* Genkal et Yarushina, sp. nov., was described from the Yamal and Tazovsky peninsulas using a scanning electron microscope. The new species is morphologically similar to *S. gracilior* and *S. francisci-josefi,* but differs from them in number of striae and areolae in 10 μm, length and width of valve.

Keywords: *Bacillariophyta*, morphology, phytoplankton, scanning electron microscopy, *Stauroneis,* Tazovsky Peninsula, Yamal Peninsula.

Stauroneis guslyakovii sp. nov. (*Bacillariophyta*) из водоемов Крайнего Севера Западной Сибири (Россия)

С. И. Генкал[1], М. И. Ярушина[2]

[1] Институт биологии внутренних вод им. И. Д. Папанина РАН, Борок, Россия
[2] Институт экологии растений и животных УрО РАН, Екатеринбург, Россия
Автор для переписки: С. И. Генкал, genkal@ibiw.yaroslavl.ru

Резюме. Изучение фитопланктона из водоемов и водотоков полуостровов Ямал и Тазовский с помощью сканирующей электронной микроскопии позволило описать новый вид рода *Stauroneis* — *S. guslyakovii* Genkal et Yarushina, sp. nov. Новый вид имеет сходство с *S. gracilior* и *S. francisci-josefi*, но отличается от них по числу штрихов в 10 мкм, длине и ширине створки.

Ключевые слова: *Bacillariophyta, Stauroneis,* морфология, сканирующая электронная микроскопия, фитопланктон, полуостров Ямал, Тазовский полуостров.

Polar regions have always been of great interest to the scientific community due to their considerable impact on the Earth's biosphere in general and, first of all, on global climate change. Biological and mineral resources demand continues to increase every decade, especially for those concentrated in the Arctic and Subarctic. A large-scale development of the Arctic has increased anthropogenic impact on all the components of natural landscapes.

A full inventory of the Arctic biota species composition using the recent developments in taxonomy is one of the priority areas of domestic research on biological diversity of the Arctic (Chernov, 2002; Getsen, 2007).

Diatoms of aquatic ecosystems in the Arctic regions of the Western Siberia are still poorly studied, and those few publications on this subject are based on light microscope studies conducted in the mid 1990s–early 2000s. A total of nine taxa of the genus *Stauroneis* Ehrenb. have been recorded (Prirodnaya, 1995; Naumenko, Semenova, 1996; Yarushina, 2002, 2007a, b). The present scanning electron microscopy study of *Bacillariophyta* from waterbodies and watercourses of the region made it possible to expand this list of species considerably (up to 29 taxa): 15 species are new for the region, five are new for Russia, and five taxa were identified to the genus level (Genkal, Yarushina, 2014a, b; 2016a, b; 2017; unpublished data).

In the present study, a new species of *Stauroneis* is described.

Material and methods

This study was based on phytoplankton samples from waterbodies and watercourses in the Yamal (Lake Tarkakhanato — 71º53′35″N, 72º18′12″E, Lake Taliyuvto — 70º11′05″N, 72º31′05″E, the Yakhydayakha River — 72º19′46″N, 70º33′10″E, Lake Yunuito — 70º40′12″N, 72º13′35″E, the Yunuiyakha River — 70º40′12″N, 72º13′49″E, Lake Yambnadato — 71º32′55″N, 71º03′01″E, Lake Khanindato — 72º19′26″N, 70º31′39″E) and Tazovsky (a nameless lake in the lower reaches of the Sobetyakha River — 67º59′51″N, 75º58′56″E, a former riverbed in in the middle course of the Ngarka-Poilovayakha River — 67º56′11″N, 75º58′15″E, the Mongoyuribei River — 67º52′20″N, 77º09′44″E, Lake «Tundrovoe» in the middle course of the Ngarka-Poilovayakha River — 67º51′25″N, 75º39′12″E, a channel flowing into the Mongoyuribei River — 67º51′21″N, 77º11′27″E, a nameless lake below the deposit — 67º48′17″N, 75º20′18″E). Collections were performed in 2004–2010 (Table 1).

Diatom frustules were cleaned from the organic matter using the cleaning method of cold oxidation (burning) in sulphuric acid and potassium dichromate (Balonov, 1975). Cleaned specimens were dried onto stubs, coated with gold using a EIKO-IB-3 sputter coater and examined using a JSM-25S scanning electron microscope operating at 15 kV.

Stauroneis guslyakovii Genkal et Yarushina, sp. nov. (Plate I)

Valves rhombical-lanceolate, gradually tapering to the long-protracted, capitate to rostrate-capitate ends. Pseudosepta absent. Valve length 48.5–71.1 μm, breadth 7.8–13.6 μm. Axial area narrow, linear. Central area forming a broad fascia, strongly expanded towards the valve margins. Raphe straight, is bordered by a small ridge on each side, filiform, with weakly expanded, non-deflected central pores. Central endings straight to the very small central pores. Striae strongly radiate throughout the entire valve, 22–28 in 10 μm. Areolae transapically elongated, 20–25 in 10 μm, interrupted at the junction between valve face and mantle.

Holotype. Sobetyakha River, 3 IX 2006, *Genkal Slide № 7002* (marked here in Pl. I, *2*), Papanin Institute for Biology of Inland Waters, Russian Academy of Sciences (IBIW RAS).

Type location. A nameless lake in the lower reaches of the Sobetyakha River, 67º59′51″N, 75º58′56″E, the Tazovsky Peninsula, Russia.

Etymology: The species is named after N. E. Guslyakov, a famous Ukrainian diatomologist.

Distribution. West Siberian Arctic: Yamal Peninsula, Tazovskiy Peninsula.

Type locality. A small running-water nameless lake (of the former riverbed origin) on the left bank in the lower reaches of the Sobetyakha River. The lake is 200 m long and 60–70 m wide. Banks are waterlogged, depth 1.5 m, transparence 0.2–0.3 м. During the sampling period the water temperature was 5.5ºC, a pH 6.5. Diatoms and green algae are the most diverse in the study area. The diatoms are represented mainly by few near-bottom species from the genera *Navicula* Bory*, Nitzschia* Hassall, *Pinnularia* Ehrenb. and *Stauroneis,* and fouling species of *Achnanthes* Bory*, Cymbella* C. Agardh*, Fragilaria* Lyngb. and *Tabellaria* Ehrenb. ex Kütz. The latter is a part of the dominant diatom complex by biomass. In general, an assemblage of species that are considered indicators of oligosaprobic conditions is typical for phytoplankton communities of the waterbody.

Differentiation. By valve shape and some quantitative characteristics (valve length and width), *Stauroneis guslyakovii* is morphologically similar to *S. gracilior* Reichardt, but differs from the latter by a smaller number of striae and areolae in 10 μm, shape and size of the central area (Van de Vijver *et al*., 2004). By valve shape and the number of striae in 10 μm, *Stauroneis guslyakovii* is similar to another species of this genus recently described from the Arctic, *S. francisci-josefi* Van de Vijver et Lange-Bert., but differs from it by a smaller valve (length 30–37 μm, width 6–7.8 μm) (Van de Vijver *et al*., 2004).

Acknowledgments

This study was supported by the Russian Foundation for Basic Research, project 15-04-00254 (Genkal S. I. «Electron microscopy study of diatom algae (*Bacillariophyta*) from insufficiently known aquatic ecosystems in the far north of Western Siberia». 2015-2-17).

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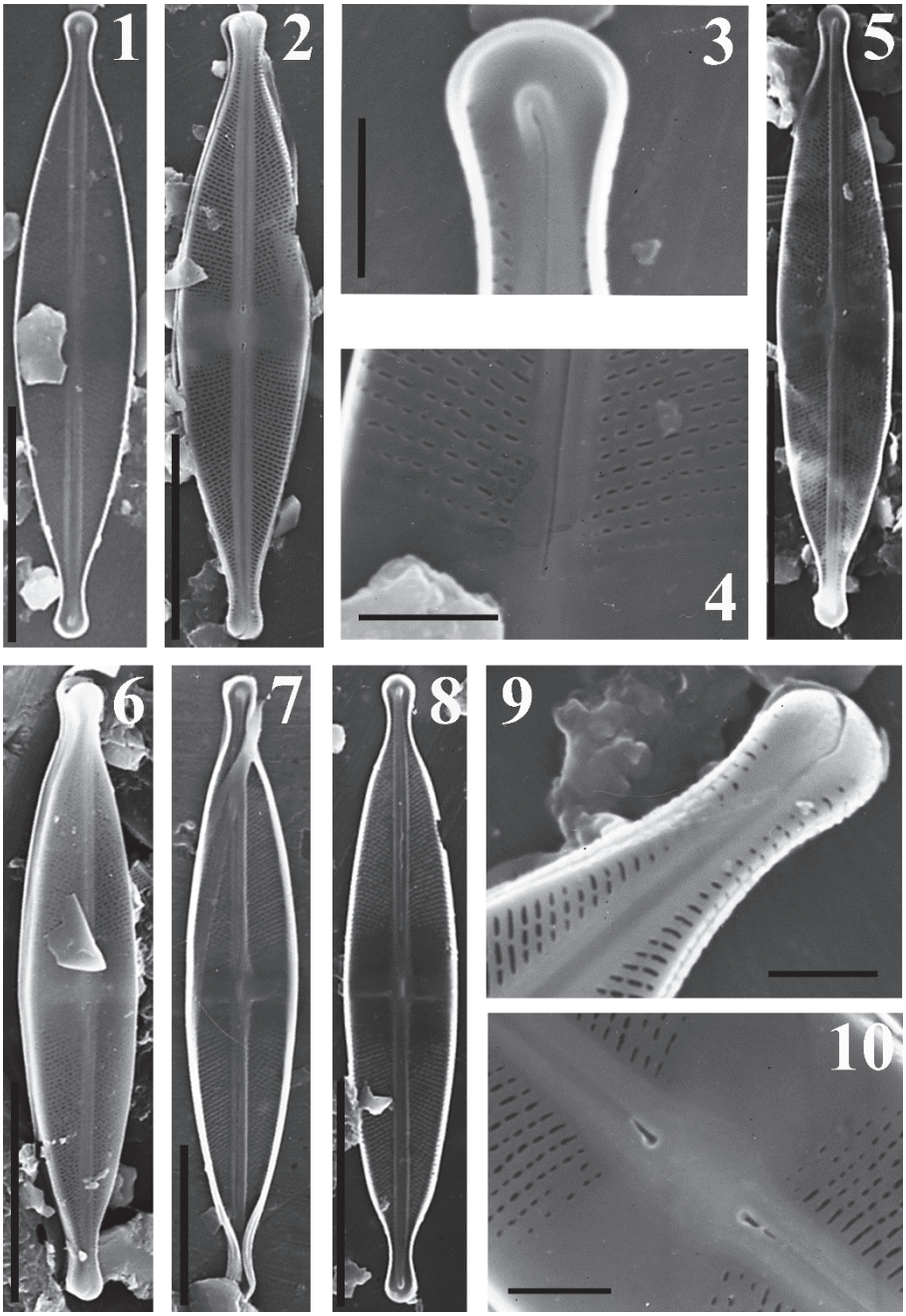

Plate I. *Stauroneis guslyakovii*

1–5, 7, 8 — internal valve view; *6, 9, 10* — external valve view; *1–4, 9, 10* — a nameless lake in the lower reaches of the Sobetyakha River; *5* — Yunuito Lake; *6, 7* — Khanindato; *8* — former riverbed in the middle course of the Ngarkpoilovayakha River. SEM. Scale bars: *1, 2, 5–8* — 10 μm; *3, 4* — 1 μm; *9, 10* — 2 μm.