

Lomonosov Moscow State University

**MARINE BIOLOGY, GEOLOGY
AND OCEANOGRAPHY —
INTERDISCIPLINARY STUDIES BASED
ON THE MARINE STATIONS AND LABS**

**80th anniversary of the Nikolai Pertsov
White Sea Biological Station**

International conference

Moscow ❖ 2018

УДК [574.5+551.46](063)
ББК 28.082я431+26.22я431
М80

Marine biology, geology and oceanography — interdisciplinary studies based on the marine Stations and Labs. 80th anniversary of the Nikolai Pertsov White Sea Biological Station. International conference. Abstracts. Moscow: KMK Scientific Press. 2018. 70 p.

Морская биология, геология, океанология — междисциплинарные исследования на морских стационарах. К 80-летию Беломорской биостанции им. Н.А. Перцова. Международная конференция. Тезисы докладов. Москва: Товарищество научных изданий КМК. 2018. 70 с.

The conference “Marine biology, geology and oceanography – interdisciplinary studies based on the marine Stations and Labs” (November 19–21, 2018) is dedicated to the 80 anniversary of Nikolai Pertsov White Sea Biological Station. This conference is held in the framework of the scientific-practical conference “Marine Research and Education”. The conference includes following topics: physiology, developmental biology and regeneration, ecology, taxonomy and phylogeny, biology of marine animals, interdisciplinary research, marine mycology, algology and microbiology, functional structure of marine species distribution ranges, and biotopes of marine communities, studies of biota and ecosystems of relict coastal lakes performed at marine Stations and Labs, including WSBS of Lomonosov Moscow State University.

В сборник вошли тезисы докладов, подготовленные участниками международной конференции, посвященной празднованию 80-летия Беломорской биологической станции им. Н.А.Перцова «Морская биология, геология, океанология — междисциплинарные исследования на морских стационарах» (19–21 ноября 2018 г.). Конференция проходит в рамках научно-практической конференции «Морские исследования и образование». Темы конференции затрагивают следующие тематики: физиология, биология развития и регенерация, экология, таксономия и филогения, биология морских животных, междисциплинарные исследования, морская микология, альгология и микробиология, функциональная структура ареалов морских организмов и биотопическая основа сообществ, исследования биоты и экосистем реликтовых прибрежных озер выполненных на морских стационарах, в том числа на ББС МГУ.

Organising committee: Sadovnichiy V.A., Abramochkin A.D., Andrianov A.V., Bubnova E.N., Dobrolyubov S.A., Grum-Grgimaylo O.A., Kirpichnikov M.P., Kosevich I.A., Krasnova E.D., Malakhov V.V., Masey Y.A., Mokievsky V.O., Puscharovskiy D.Y., Rimskaya-Korsakova N.N., Romanenko F.A., Rubtsov A.M., Shabalin N.V., Shoba S.A., Skulachev V.P., Spiridonov V.A., Tokarev M.Yu., Tzetlin A.B., Vortsepneva E.V., Zhadan A.E.

***The conference is supported by the Russian Fond for Basic Research,
grant No. 18-04-20101***

ISBN 978-5-907099-39-5

© WSBS, 2018
© KMK Scientific Press, 2018

Seasonal Variations in Community Structure of Anoxygenic Phototrophic Bacteria From the Meromictic Lake Trekhtsvetnoe (Kandalaksha Bay, White Sea)

**Lunina O.N.¹, Savvichev A.S.¹, Krasnova E.D.², Kokryatskaya N.M.³, Voronov D. A.^{4,5},
Letarova M. A.¹, Gorlenko V. M.¹**

¹*Winogradsky Institute of Microbiology, Research Center of Biotechnolog, Russian Academy of Sciences, Moscow.*

²*Pertsov Whit Sea Biological Station, Lomonosov Moscow State University.*

³*Laverov Federal Research Center for Comprehensive Arctic Studies, Russian Academy of Sciences, Arkhangelsk.*

⁴*Kharkevich Institute for Information Transmission Problems, Russian Academy of Sciences, Moscow.*

⁵*Belozersky Institute of Physico-Chemical Biology, Lomonosov Moscow State Ubiversity, Moscow.*

It is known that in the water chemocline zone of meromictic lakes a microbial community consisting of phototrophic, chemotrophic and heterotrophic microorganisms forms. If in such a community brown-colored (b/c) green sulfur bacteria (GSB) present, they usually develop at the lower boundary of the photic area.

Since 2012, we studied the microbial community of meromictic Trekhtsvetnoe Lake, which connects with Kandalaksha Bay of the White Sea. First it was shown that in water chemocline zone green-colored (g/c) GSB *Chlorobium phaeovibrioides* develop. Further studies have shown also b/c GSB in the lake developing, and in summer seasons b/c GSB localize in the upper part of the community above the green water layer.

In winter, due to the distance of water chemocline from the ice surface, the lack of surface lighting was limited g/c GSB development, and optimal conditions for b/c GSB in the upper part of the green water layer appeared. However, despite the deep adaptation to extremely low light, the amount of b/c GSB did not reach g/c GSB extent, which was probably due to low rate of b/c GSB growth in low light conditions.

After ice melting, g/c cells quickly reached an extremely large number. A dense of green water layer (not less than $2.0\text{--}2.3 \times 10^8$ cells ml⁻¹) did not pass surface light into the lower horizons, which prevented the development of b/c GSB there. Thus, in the summer b/c GSB locked in extremely adverse conditions between dense layer of g/c GSB and well-lit oxygen layer. There was gradual displacement of b/c cells in the oxygen zone, where they quickly lost viability, being strict anaerobes. Single viable brown cells were preserved inside the high-density green layer, which was confirmed by cultivation of water samples in agar medium.

Benthos of the subtidal zone of the Kislaya Bay (White Sea, Kandalaksha Bay)

***Mardashova M.V.*¹, *Lokteva V.*², *Aphentyeva A.*², *Agaphonov I.*², *Smolentseva D.*², *Ivanova A.*², *Proensa G.A.*², *Yakovleva E.*², *Kilina A.*², *Azarov A.*², *Koschenko Y.*², *Amisimov M.*², *Ravinsky D.*², *Spirichina L.*², *Smirnov A.*², *Menshinina L.*², *Voronov D.A.*^{3,4}, *Krasnova E.D.*⁵**

¹*Centor of marine studies MSU.*

²*Faculty of Physics MSU.*

³*Kharkevich Institute for Information Transmission Problems, Russian Academy of Sciences, Moscow.*

⁴*Belozersky Institute of Physico-Chemical Biology, Lomonosov Moscow State University, Moscow.*

⁵*Pertsov Whit Sea Biological Station, Lomonosov Moscow State University.*

In August 2018, macrozoobenthos of the nook part of Kislaya Bay was investigated. Its waters adjoin to two separating basins: the meromictic Lake Nizhnee Yershovskoye and saline lagoon on the Green. The study area falls within a depth range of 1.1 to 11 m. A total of 78 species of benthic invertebrates were found in the material. In general, the community can be attributed to the *Macoma balthica* biocenosis, which is characteristic of silty and sandy soils of the corresponding depths in the vicinity of the WSBS MSU. The communities of the deep-water (6-10 m), shallow-water and the community of narrow shallow-water strait separating the nook from the Kislaya Bay from its southeast part are distinguished. This paper compares the fauna of the Kislaya Bay with that of the saline lagoon on Green Cape, the bucket bay Babye More and the separating reservoirs of Son-Island. The Kislaya bay is a bucket bay with a marine hydrological structure and fauna and can serve as a backdrop for comparing reservoirs in the early stage of separation from the White Sea.

Observations of the population of *Ophioglossum vulgatum* L. around the Sour-Sweet lake.

***Mardashova M.V.*¹, *Kosenkov A.V.*, *Lokteva V.*², *Aphentyeva A.*², *Agaphonov I.*², *Smolentseva D.*², *Ivanova A.*², *Proensa G.A.*², *Yakovleva E.*², *Kilina A.*², *Azarov A.*², *Koschenko Y.*², *Amisimov M.*², *Ravinsky D.*², *Spirichina L.*², *Smirnov A.*², *Menshinina L.*², *Voronov D.A.*^{3,4}, *Krasnova E.D.*⁵**

¹*Centor of marine studies MSU.*

²*Faculty of Physics MSU.*