

Polar Ecology Conference 2014

21st – 25th September 2014
České Budějovice, Czech Republic

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DIVERSITY OF THE CYANOPROKARYOTA OF THE AREA OF SETTLEMENT PYRAMIDEN (SVALBARD)

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KEYWORDS: CYANOPROKARYOTA, DIVERSITY, SVALBARD

Cyanoprokaryota (Cyanophyta, Cyanobacteria) comprise a prominent and essential autotrophic component of polar biota. Study of the cyanoprokaryotes of Spitsbergen archipelago began in the nineteenth century (Skulberg, 1996). There are numerous publications concerning the diversity of the freshwater and terrestrial cyanoprokaryota of Spitsbergen archipelago.

The present study adds new information on the freshwater and terrestrial cyanoprokaryota on the Spitsbergen archipelago. The investigated area is located in the central part of Spitsbergen, in the eastern part of the Dickson Land, on the western shore of Billefjorden.

Samples were collected during 25 July – 3 August, 2008 and 1 – 10 August, 2013 in the area covering Mimerdalen, Tordalen valleys, Planteryggen, Reuterskiöldfjellet, Pyramidén, Svenbrehøgda mountain slopes

In total, 243 samples were collected. The populations of cyanoprokaryota were identified, measured and photographed using the optical microscope AxioScope A1 (Zeiss©).

A total of 67 cyanobacterial taxa were identified in the habitats of investigated area. The highest number of species was found on wet seepages on the slopes (33 species), in slow tundra streams (26 species) and wet soils (21 species).

Eleven species are first time records for Spitsbergen flora: *Anabaena inaequalis*, *Calothrix aeruginosa*, *Chroococcus spelaus*, *C. subnudus*, *Gloeocapsa rupicola*, *G. violascea*, *Gloeotheca palea*, *Leptolyngbya bijugata*, *Lyngbya martensiana*, *Rivularia coadunata*, *Trichocoleus sociatus*.

Nostoc commune (58 observation), *Calothrix parietina* (11 observation), *Microcoleus autumnalis* (9 observation) were the most abundant species in the investigated samples. Comparison of flora of cyanoprokaryotes in the vicinity of settlement Pyramidén with other Svalbard areas shows significant difference in diversity of different parts of archipelago and quite original species composition in Pyramidén area. Most similar (the difference in species composition over 60 %) are flora of the Grønfjorden west coast (Davydov, 2013) and flora of the Rijpfjorden east coast (Davydov, 2013), but only less than 30 % of species are common.

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DIVERSITY OF TERRESTRIAL CYANOPROKARYOTES IN POLAR DESERTS OF THE NORTHERN HEMISPHERE

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KEYWORDS: CYANOPROKARYOTES, POLAR DESERTS, ARCTIC

Cyanoprokaryota (Cyanobacteria) are ancient spore phototrophic organisms. They participate in cycles of oxygen, nitrogen, silicon, phosphorus, and many other nutrients in aquatic and terrestrial ecosystems. With reduced competition from higher plants, cyanoprokaryotic mats and films occupy significant territories in polar deserts. The studies on cyanoprokaryot in polar deserts are rare and inhomogeneous due to the problems of the region accessibility. The diversity of cyanoprokaryota species, living in terrestrial conditions in polar deserts of the northern hemisphere, was evaluated using all available published articles as well as samples which were analysed by the authors from North-East Land Island (Svalbard) and Bolshevik Island (Severnaya Zemlya Archipelago).

List of terrestrial cyanoprokaryota was done for 12 areas of the polar deserts. It includes 148 species of 50 genera, 19 families. The highest number of species cyanoprokaryota were revealed for the Franz Josef Land Archipelago (59) (Novichkova-Ivanova, 1972), North-East Land Island (Svalbard) (57 species) (Davydov, 2013), and Bolshevik Island (Severnaya Zemlya Archipelago) (39) (Patova, Belyakova, 2006). The number of species varied from 4 to 57 for the rest territories. The numbers are comparable with other taxonomic lists from different regions of the Arctic and Antarctic. Up to date, the list of cyanoprokaryota species in Barents province of the arctic polar deserts has 107 species, in Canadian province of the arctic polar deserts it includes 29 species (Elster et al., 1999), and in Siberian province - 39.

Dominant complexes forming species of the genera *Nostoc*, *Microcoleus*, *Phormidium*, *Symplocastrum*, *Aphanocapsa*, *Chroococcus*, *Gloeocapsa*, *Pseudanabaena*, *Scytonema*.

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