

Field trip to the spring bog near Syktyvkar

Mires of downstream nature (spring bogs) attracted the attention of not only mire experts, but also specialists from other fields, for example plant scientists, zoologist and others because this kind of mire ecosystems are rare nature systems that are of great value for the conservation of biological diversity. Spring bog are not so common as other types of mires, but have the highest level of floristical and coenotical diversity. There, we can find many rare species of vascular plants.

Our spring bog is located in the east part of European Russia, middle taiga, near the Syktyvkar 3-3.5 km south-east from the city at the watershed between Sysola and Vychedga rivers (N 61°40'08", E 51°02'52", 116 meters above sea level).






Close underlying of mineral ground waters (table) result in their exit to the surface in the form of springs. This causes specific floro-coenotic complex with high diversity of vascular and spore plants and complicated vegetation communities structure.

Table. Physical-chemical parameters of bog waters



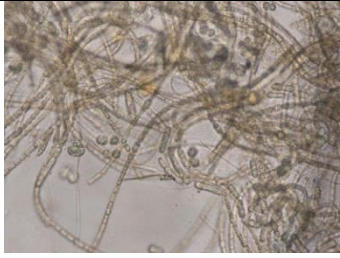

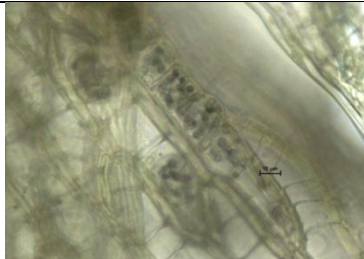

Parameter	puddle	sphagnum	stream	depression (forest)	depression (forest)	depression (forest)	spring
pH	7.3	7.37	4.35	7.27	7.14	7.37	7.91
electrical conductivity, μS	147	115	303	236	273	340	156
salinity, ppm	73	58	152	117	136	170	76
temperature	20.5	20.5	20.5	19.8	20	20.5	7.5

Vegetation is heterogenous, with high level of species and coenotical diversity. Microrelief is smooth, small-hummock or hummock. The level of ground waters ranges from +20 to -40 cm. Maximal values were found near spings and in the small puddles; minimal – on elevations of the microrelief of various origins. Vegetation cover is very diverse. Its structure is often specific. Some sites look like parkland with groups of trees (pine, birch, spruce) and herbal cover. In general, tree-herb-moss and herb-moss groups of vegetation are most abundant here. Plant species diversity is rather high - up to 50 species including vascular plants and mosses. Species number in the communities ranges from 7 to 35 taxa. The most of mineral nutrients are of ground water origin at this type of mires. So, along with mesotrophic plants *Menyanthes trifoliata*, *Carex rostrata*, *C. lasiocarpa* and others, such species, requiring richness of the substrate, can be found here as *Bistorta major*, *Calla palustris*, *Carex appropinquata*, *C. caespitosa*, *C. cinerea*, *C. paupercula*, *Equisetum fluviatile* *Comarum palustre*, *Eriophorum gracile*, *E. polystachion*, *Pedicularis sceptrum-carolinum*, and *Rumex acetosella*. The communities have complicated vertical and mosaic structure. There are dense (total projective cover more than 70%) communities with high species diversity, where, in addition to eutrophic, more oligotrophic species associated with barrel trunks grow. Sphagnum mosses are from mesotrophic and eutrophic ecological groups (*Sphagnum warnstorffii*, *S. subsecundum* and others). The dominant positions of the sphagnums are weakened due to the increase in the share of mosses like *Paludella squarrosa*, *Plagiomnium ellipticum*, *Thelypteris palustris* and others that are demanding for the trophicity of the substrate.

By the moment, there are 80 species of vascular plants and mosses at the bog. Here, we found vast and numerous population of rare orchid *Dactylorhiza traunsteineri*, listed in the Red Book of Russia. Also there is rare species *Dactylorhiza incarnata* and *Thelypteris palustris* included in the Red Data Book of Komi(2009). Populations of these species are also numerous. One other orchid, establishing the bog, *Platanthera bifolia* requires biomonitoring.

		
<i>Dactylorhiza traunsteineri</i>	<i>Dactylorhiza incarnata</i>	<i>Thelypteris palustris</i>

Mineral springs create conditions for development of Cyanobacteria in the streams, puddles, at sphagnum and green mosses. Species diversity of Cyanobacteria is not high, but several species are abundant and form biofilms at the surface of plants and roots together with diatoms and bacteria. Dominant complex includes heterocytic cyanobacteria *Anabaena verrucosa* Boye-Petersen, *A. saaremaaensis* Skuja *Nostoc paludosum* Kützing ex Bornet et Flahault, *N. punctiforme* (Kützing ex Hariot) Hariot, *Microchaete tenera* Thuret ex Bornet et Flahault, *Hapalosiphon pumilus* Kirchner ex Bornet et Flahault, *Cylindrospermum* sp., as well as non-heterocytic species from *Phormidium* and *Leptolyngbya*.

		
<i>Films in the streams</i>	<i>Anabaena saaremaaensis</i>	<i>Anabaena verrucosa</i>
		
<i>Colonies on plants</i>	<i>Nostoc punctiforme on sphagnum mosses</i>	<i>Microchaete tenera</i>

This spring bog is very promising for the preservation rare species of the European and the Komi Republic and is recommended to be included in the system of nature protected areas.

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