



Eutrophic mire, its characteristics and modern conditions of peat genesis

L. I. Inisheva, O. A. Golubina, Yu. D. Zaplatnikova, and L. I. Dubrovskaya
Tomsk State Pedagogical University, agroecol@tspu.edu.ru

The study of structure functional organization of Siberian mire ecosystems is the base of after-effects influence of their reclamation on global changes of biosphere. The aim of this investigation is to study the structure functional organization of eutrophic mire ecosystem "Tagan".

Peat deposit "Tagan" (West Siberia, 20 kilometers near Tomsk) is situated on the second flood-plain terrace of the river Tom of ancient flow channel. Maximum power of peat deposit is 9.3 meters. Subsoil is made up from sand, more seldom from loamy sand and loam. Eutrophic vegetation covers almost the whole mire. It is presented by woody sedge, sedge, sedge-moss and grass undershrub phytocenoses. The oligotrophic vegetation is presented by Sphagnum pine cotton-grass phytocenosis. There were organized three observation points on the mire in 2007. They watched dynamics of hydrothermic, redox, biological, hydrochemical regimes. There were studied physico-chemical properties at given points. Peats with normal ash basically refer to grass, woody grass group of lowland type. They are characterized by high degree of decomposition which is increased down deposit. Group composition of organic matters of investigated peats showed that bitumen content in peat changes from 1.4 to 3.56%, and humid acids content is within the limits of 16.67 – 44.34 %. Water-soluble and hardly-hydrolyzed matters are contained in quantity of 19.04 - 49.76% of the whole dry peat mass. The overall nitrogen content changes within the limits of 1.76 – 3.52%. It is presented mainly by fraction of unhydrolyzed nitrogen (72.07 – 95.67% of the whole nitrogen). Highly-hydrolyzed nitrogen is the most available reserve of mineral compound of nitrogen and its content changes within the limits of 0.18 – 4.79 of the overall nitrogen.

2008 year is characterized as an average year at conditions of moistening and heat providing. Investigations, made during this year, revealed the following results. Bog waters were kept at a surface level of 20 – 69cm in summer. Peat deposit heating up to 10°C was observed at a depth of 120cm. Oxidizing conditions are traced up to 40 – 60cm deep. There is gradual change into restoring conditions deep in peat deposit. Very reduction conditions are observed at a depth of 60cm. Weather conditions of 2008 year were favorable for biological processes activation. In the result of their manifestation hydrochemical composition of bog waters was formed.

First of all, one should pay attention to weak alkaline reaction of bog waters. Calcium content in bog waters changes from 70.2 to 150.9 mg/l. One may state calcium removal from peat deposit of eutrophic mire into an outfall. The latter is the river which is flowing along the mire. Magnesium concentration in bog waters changed within the limits of 8.5 – 42.5 mg/l. It is important to note high content of iron in individual months – up to 17.8 mg/l. Organic matters content in bog waters, which are presented by humid acids (HA) and fulvic acids (FA), is HA 3.4 – 24.65 mg/l, FA 11.0 – 58.3 mg/l.

Let's, first of all, examine dynamics of individual components in bog waters. Thus, content of calcium, water-soluble carbon, and fulvic acids naturally increased in July, when it was marked combination of high temperature and minor precipitation. Active iron in bog waters had the highest concentration in spring which had gradually decreased by September (from 18 and 8 mg/l to 0.1 mg/l).

Preliminary obtained results reveal bog drainage occurring at present. It is followed also from the fact that there are favorable redox conditions in a meter layer of peat deposit and high degree of peats decomposition. The examination of dynamics of hydrothermic, biological and hydrochemical regimes also is evidence of biological processes activity in eutrophic mire "Tagan". This fact, in its turn, influences on hydrochemical compound formation of bog waters.