



Influence of different kind of peats on some physico-chemical properties, biochemical activity, the content of different forms of nitrogen and fractions of humic substances of The Great Vasyugan Mire

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Mires, or peatlands belong to the wetlands ecosystems where carbon is bounded in primary production and deposited as peat in water saturated, anoxic conditions. In those conditions, the rate of the supply of new organic matter has exceeded that the decomposition, resulting in carbon accumulation.

Place of sampling belongs to an oligotrophic landscapes of the river Klyuch basin in spurs of Vasyugan mire. The catchment represents reference system for Bokchar swampy area (political district of Tomsk region). Landscape profile crosses main kinds of swampy biogeocoenosis (BGC) toward the mire center: paludal tall mixed forest, pine undershrub Sphagnum (high riam, trans-accumulative part of a profile, P2), pine-undershrub Sphagnum (low riam, transit part, P3), sedge-moss swamp (eluvial part, P5).

The latter represents an eluvial part of a slope of watershed massif where it is accomplished discharge of excess, surface, soil-mire waters. The depth of peat deposit of sedge-moss swamp reaches 2,5m. To the depth of 0,6m there is a layer of Sphagnum raised bog peat, then it is a mesotrophic Scheuchzeria Sphagnum layer and at the bottom there is a thick layer of low-mire horsetail peat.

The samples of peats were taken from two places (P2 and P3), both from the depth 0-75 cm of the great Vasyugan Mire. These materials represent (P2) Sphagnum fuscum peat (ash content ranged from 10.8 to 15.1%), but samples P3 belong to low-moor sedge peat (ash content ranged from 4.5-4.8%).

The differences in water level, redox potential, pH, degree of degradation, bulk density, number of microorganisms, activity of enzymes, different kinds of nitrogen and humic substances were studied in two different peat soils characterized by different type of peat.

In general in P2 the redox potential changed from 858 to -140 mV, higher activity of xanthine oxidase and peroxidase, different kinds of microorganisms (ammonifying bacteria and cellulose decomposing microorganisms) and different kinds of nitrogen (mineral, easily hydrolysable, hardly hydrolysable and non-hydrolyzable), bitumines, 3 fractions of humic acids and 3 fractions of fulvic acids were determined in the deep 0-25 cm than in 50-75 cm. The ratio HA/FA in the depth 0-25 cm was equal to 1.87, but in the depth 50-75 cm was equal to 7.66.

Contrary was observed for P3. For this peat with the increase of the deep of sampling the decrease of total nitrogen, activity of enzymes (xanthine oxidase and peroxidase) is connected with the changes of Fe^{+2}/Fe^{+3} and lower difference of redox potential than in P2. The ratio HA/FA in the depth 0-25 cm was equal to 0.56, but in the depth 50-70 cm was equal to 0.84.