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Impact of catchment degree on peat properties in peat deposits of eutrophic bog

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Fundamental works of many investigators show that according to the biophysical properties peat deposit (PD) is divided into 2 layers: active and inert. It is interesting to analyze the supposed changes in PD of eutrophic bog according to different data (physical, chemical and biological). The researches were carried out at two plots of one bog (points 1 and 2, positions 56˚21' NL, 84˚47' EL, Russia, Siberia). Agricultural afforestation (pine planting) was made at one of them (point 2) 60 years ago. Now this plot is absolutely identical in ground cover to 1 point, but other conditions are significantly changed. In spring bog water level is at the depth of 20cm at 2 point (at 1 point it is near water face), it lows up to 53 cm during summer time (at 1 point – up to 37 cm). According to redox conditions zone of anoxic-oxic conditions reaches meter depth at 2 points. PDs don't significantly differ in activity of ammonifiers but in activity of cellulose-lytic aerobic microflora it follows that it is more active at 2 point in PD active layer. In spite of good aeration, more favorable conditions were created also for anaerobic cellulose-fermenting microflora in PD of 2 point in comparison with 1 one. Activity analysis of denitrifying agents and microflora of other physiological groups also showed high activity of biota at the plot with afforestation amelioration. This fact was confirmed by high coefficient of mineralization. Time of drainage effect created by afforestation amelioration influenced group composition of peat organic matter which builds up PD of examined plots. According to fractional and group composition data fracture of hard-to-hydrolyze organic matters decreased during the process of microflora activating at the plot with afforestation amelioration but FA content increased. Fractional composition of nitrogen showed that content of mineral nitrogen compounds definitely increased. Thus, 60 years of surface drainage influenced composition change of peat organic matter along all PD profile. In our opinion, it is explained by rearrangement of qualitative and quantitative composition of microbic biota in consequence of alternate anoxic-oxic conditions creation along all PD of investigated eutrophic bog located in the dingle of ancient flow.

Keywords: peat deposits, eutrophic bog, Siberia, microbiological processes, change of organic matter.

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