Geophysical Research Abstracts
Vol. 21, EGU2019-12889, 2019
EGU General Assembly 2019

Transformation of peat organic matter in the European segment of wooded tundra

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Peat deposits dominate in the northern region. Peat-bog ecosystems present a great source of organic matter reserves, a place of freshwater accumulation, and also extremely important for maintaining the homeostasis of adjacent biogeocenoses. The composition of peat deposits is largely determined by climatic and hydrological conditions. Therefore, it is difficult to extrapolate the available data on the composition of peat soils of the temperate continental belt to regions with a cold climate. In addition, the development of wetlands inevitably associated with their drainage, which can lead to the transformation of organic matter. This aspect also requires special consideration.

In the present study, as a test plot, areas of high-moor peat bog massifs located on the territory of the Mezen district of the Arkhangelsk region (wooded tundra) were used. The body of bog massive is composed of high-moor sphagnum peat through the entire depth of the profile. Homogeneous horizons were visually distinguished, through the soil profile, the thickness of which ranged from 15 to 95 cm.

Group chemical composition of peat was evaluated by the method of sequential disassembly according to the author's method. The studied samples are characterized by low ash content, relatively low degree of decomposition and bitumen content within 2.5-6%. The transformation of organic matter proceeds predominantly with the formation of humic compounds, under natural conditions. The proportion of bitumen compounds gradually increases with the depth, whereas the ratio of easily and hard hydrolysable parts changes slightly. Draining, vice versa, leads to an increase in the proportion of easily hydrolysable compounds, but not humification. Apparently, the processes of hydrolytic destruction of organic matter are first intensified, during aeration of the deeper layers of the studied peat deposit.

An increase in the degree of decomposition is accompanied by a change of the fulvate type of humus to a humate type. At the same time, the sensitivity of hydrodynamic characteristics of extracted humates to the conditions and depth of geo-transformation was revealed. It was established that the behavior of humic substances in solutions is determined by the polymolecular properties, structure and presence of bitumens in preparations. This should be taken into account when interpreting research results.

The reported study was funded by MES of Russia under the theme number № -18-118012390224-1, RFBR_(Arctic resources) according to the research project № 18-05-70087.