



Morphological, micromorphological and mineralogical changes in post-agrogenic soils.

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Due to large areas of abandoned land in Russia, it is necessary to identify indicators that allow to establish the direction of the evolution of the properties and composition of the post-agrogenic soil. This is necessary for the rational use of abandoned areas. One of these indicators is the mineralogical composition of finely-dispersed fractions (<1 , 1-5, 5-10 μm), which determine the stocks of plant nutrients and a number of physical properties and soil fertility.

The aim of the study is to identify changes in morphological, micromorphological and mineralogical composition of soils under different plant communities.

Soils were sampled in the south of Arkhangelsk region. Soils are formed on clay moraine of Moscow glaciation. Soil profiles were dug on interfluvium. We selected 4 plant communities on different stages of succession: upland meadow, 16-year-old birch forest, 16-year-old spruce forest and 70-year-old spruce forest.

To separate soil fractions <1 micron, 1-5 micron and 5-10 micron samples were rubbed into a thick paste and sedimented. Oriented preparations of fractions were examined by XRD method. Micromorphological studies have been performed on the classical methods using mineralogical microscope Olympus BH51 with a digital camera Olympus DP26.

All profiles have evidence of anthraquic horizon and they have plough pan on a depth of 20-24 m (confirmed by bulk density). The ploughed horizon is better expressed in soils under the meadow. All 4 soils are characterized by presence of Fe-Mn segregations throughout the profiles, particle size distribution heaving to the lower horizon and residual albic horizon. Upper horizons on micromorphological level don't have significant changes.

The following compounds of silt and silty fractions are the main indicators of the profile differentiation: the impoverishment of the upper layers with mixed layer formations with smectitic packages occurred. Chlorite-vermiculites, caolinite and fine-dispersed quartz are relatively accumulated here.

The character of distribution for all of the texture fractions is elluvial-illuvial. The content of the silt fraction in upper horizons is minimal. The profile differentiation depends on the vegetation type. The highest differentiation occurs under the dry meadow and spruce forest.