



Influence of selected physicochemical parameters on microbiological activity of mucks.

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Abstract : One of the basic factor decided about soil fertility are microorganisms that together with flora, determine trend and character of biochemical processes as well totality of fundamental transformations connected with biogeochemistry and physicochemical properties of soil. Determination of general bacteria number, quantity of selected groups of microorganisms and investigation of respiration intensity let estimate microbiological activity of soil. Intensity of microbiological processes is directly connected with physicochemical soil parameters. In that case, such structural parameters as bulk density, porosity, surface or carbon content play significant role. Microbiological activity also changes within the bounds of mucks with different stage of humification and secondary transformation. Knowledge of relations between structural properties, microorganism activity and degree of transformation and humification can lead to better understanding microbiological processes as well enable to estimate microbiological activity at given physicochemical conditions and at progressing process of soil transformation.

The study was carried out on two peaty-moors (muck) soils at different state of secondary transformation and humification degree. Soil samples were collected from Polesie Lubelskie (layer depth: 5 – 25 cm). Investigated mucks originated from soils formed from low peatbogs. Soil sample marked as I belonged to muck group weakly secondary transformed. Second sample (II) represented soil group with middle stage of secondary transformation. The main purpose of the research was to examine the relations between some physicochemical and surface properties and their biological activity. Total number and respiration activity of microorganisms were determined. The effectiveness of utilizing the carbon substances from the soil by the bacteria increased simultaneously with the transformation state of the peat-muck soils. Quantity of organic carbon decreased distinctly in the soil at the higher stage of secondary transformation and it influenced quantity and activity of soil microorganisms. Bulk density and surface increased with increasing secondary transformation degree. On the other hand, porosity decreased with increasing secondary transformation index. Process of secondary transformation influenced the soil environment for the microbes by changing the physicochemical properties. This way it influenced the number of microorganisms and caused changes of biological activity in the soils.