



Transformations of mineralogical composition of soil colloidal fraction exposed to the phosphorus sorption

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Fast and strong immobilisation of phosphorus in soil used to be the base to consider this soil element as stable in the environment. The global eutrophication problems, started in the 1980s, have changed the approach to thinking about phosphorus and its mobility. The phosphorus, strongly sorbed by the soil particles (particularly colloids), can influence their surface properties during the sorption process, leading to changes of mobility of colloidal particles in the soil environment. A variety of research on the phosphorus chemistry and its forms of appearance do not pay a lot of attention to the issues concerning the influence of high phosphorus content on the state of soil colloids mobility and vulnerability for their leaching out of soil in relation to their chemical-physical and physical properties.

The research was conducted in order to esteem an influence of high phosphorus doses on the mineralogical composition of soil colloidal fraction separated from two sorts of soil: (i) phosphorus-saturated and (ii) phosphorus-poor. The investigation was grounded on the characteristics of mineralogical composition, particle-size distributions and microscopic observations of colloids.

On the basis of the research carried out in the laboratory conditions there were observed some transformations in mineralogical composition towards the increased amounts of the fine-crystalline minerals (e.g. smectite, chlorite and mixed-layer: illite-smectite, illite-chlorite, chlorite-smectite) together with an increase of the amount of phosphorus in the clay-sized fraction. The increase of the dispersion of the $< 2\text{-}\mu\text{m}$ fraction was also noticed in the results of the particle size distribution analyses and

the microscopic observations as an influence of the increasing amounts of the sorbed P. Supposedly, the higher dispersion of soil colloids might have a modifying influence on the other soil properties, e.g. the magnitude of specific sorption area, which determines the soil sorptive properties. Increased dispersity may also have an impact on the mobility of soil colloids and phosphate sorbed by them in the soil environment. It simultaneously might be in relation to the eutrophication problems of aquatic reservoirs and, consequently, have importance for the environmental quality.