

## Reflection of Landscape Agrodenization in the Soil Cover Structure and Profile Morphology: Example of Lithuania Agroecosystem

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**Abstract :** Lithuanian territory is characterized by landscape with prevailing morain hills and clayey lowlands. The largest part of it has endured agrodenization of various degrees which was the cause of changes both in the structure of landscape and soil cover, transformations of soil profile and degradation of natural background soils. These changes influence negatively geocological potential of landscape and soil and contribute to the weakening of the sustainability of agroecosystems. Research objective: to reveal the landscape agrodenization induced alterations of catenae and their appendant soil profiles in Lithuanian morain hills and clayey lowlands. Methods: Soil cover analysis and catenae charting was conducted using landscape profiling; soil morphology detected and soil type identified following WRB 2014. Granulometric composition of soil profiles was obtained by laser diffraction method (lazer diffractometer Mastersizer 2000). pH was measured in H<sub>2</sub>O extraction using potentiometric titration; SOC was determined by the Tyurin method modified by Nikitin, measuring with spectrometer Cary 50 (VARIAN) in 590 nm wavelength using glucose standards. Results: analysis showed that the decrease of forest vegetation and the other natural landscape components following the agrodenization of the research area influenced differently but significantly the structural alterations in soil cover and vertical soil profile. The research detected that due to landscape agrodenization, the suppression of zone-specific processes and the intensification of inter-zone processes determined by agrodenic factors take place in Lithuanian agroecosystems. In forested hills historically prevailing Retisols and Histosols territorial complex is transforming into the territorial complex of Regosols, Deluvial soils and drained Histosols. Processes taking place are simplification of vertical profile structure, intensive rejuvenation of profile, disappearance of the features of zone-specific soil-forming processes (podzolization, lessivage, gley formation). Erosion and deluvial processes manifest more intensively and weakly accumulating organic material more intensively spread in a vertical soil profile. The territorial soil complex of Gleyic Luvisols and Gleysols dominating in forested clayey lowlands subjected to agrodenization is transformed into the catena of drained Luvisols and pseudo Cambisols. The best expressed are their changes in moisture regime (morphological features of gley and stagnic properties are on decline) together with alterations of pH and distribution and intensity of accumulation of organic matter in profile. A specific horizon, antraquic, uncharacteristic to natural soil formation is appearing. Important to note that due to deep ploughing and other agrotechnical measures, the natural vertical differentiation of clay particles in a soil profile is destroyed which leads not only to alterations of physical qualities of soil, but also encumbers the identification of Luvisols by creating presumptions to misidentify them as Cambisols. The latter have never developed in these ecosystems under the present climatic conditions. Acknowledgements: This work was supported by the National Science Program: The effect of long-term, different-intensity management of resources on the soils of different genesis and on other components of the agro-ecosystems [grant number SIT-9/2015] funded by the Research Council of Lithuania.

**Keywords :** agroecosystems, landscape agrodenization, luvisols, retisols, transformation of soil profile

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