

Medieval land use management and geochemistry - spatial analyses on scales from households properties to whole fields systems

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We present the final or preliminary results of our researches of five villages: Spindelbach (Ore Mountains, North-Western Bohemia), Hol (near Prague, Central Bohemia), Lovětín and Regenzholz (near Třešť, Czech-Moravian Upland) and Goschwitz (near Wrocław, Poland). Our research is methodically based on broad spatial sampling of soil samples and mapping of basic soil conditions. We use XRF spectrometry as a main tool for multi-elemental analyses and as a tool for first step screening of large areas. The crucial factor of our methods is also a design of sampling based on a respect to historical land and land use features like parts of village field system or possessions of the households. Also macroscopic visual method of getting data and knowledge of the site is crucial.

It was revealed that generally used and acknowledged human indicator – Phosphorus – can be present at only very low levels of concentration, or undetectable, even in the nearness of households. The natural conditions cannot be the causing factor at all cases. This situation is caused also by last human activity intensity and by its spatial manifestation. In such cases, multi-elemental analysis is very useful. Zinc is usually correlated with Phosphorus, which is also connected to Lead. The past human activity indicators are spatially usually connected to modern pollution indicators. These two inputs can be sometimes distinguished by statistical analyses and by spatial visualisation of data. Working with just concentrations can be misleading.

Past land use management and its strategies were important for spatial distribution of soil geochemical indicators. Therefore, we can use them not only as quantifiers of human impact on nature, but we can also detect different management or knowledge and experience. As it was revealed e. g. by analyses of households' possessions differences. For example, generally presumed decreasing gradient of management intensity (e.g. manuring) along the distance from village can be found on the level of a whole field system, but it varies a lot between the possessions' parcels.

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