Application of the microbiomorphic (phytolith) analysis in the geoarchaeological study of the land-use at the Voorthuizen-Wikselaarseweg archaeological site (Netherlands)

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In 2018, the Voorthuizen-Wikselaarseweg archaeological site was excavated. This settlement dates back to Roman and Medieval times and is located in the central part of the Netherlands: the so-called Gelderse Vallei, an area build-up of fluvioperiglacial and eolian sands. Questions related to the anthropogenic influence of settlers on the surrounding landscape, as well as the specification of the ancient agricultural activity, were among the main research tasks posed to this archaeological study. Despite the fact that modern geoarchaeology offers a variety of methods of researching archaeological sites, in practice, the vast majority of archaeological work in the Netherlands is limited to the use of palynological and macrobotanical analyzes and radiocarbon dating. The choice of research methods in relation to the sandy cultural layer is especially narrow as it is assumed to bear worse conditions of preservation of traces of anthropogenic activity.

For the investigation of the sandy cultural layer of Voorthuizen, a method of microbiomorphic (phytolith) analysis was proposed. The information that is given by this method is different from that provided by palynological study (though they strongly complement each other). While pollen provides a general insight into the plant growth in the region around the settlement, phytoliths (silica copies of plant cells) present data on the plant species grown, eaten, and used on the settlement itself. This information is contained in the old living layer, as well as in the pits (working places and waste pits), postholes, ditches etc. The combination of phytoliths and other microbiomorphs (e.g. detritus, diatoms, etc.) essentially broadens the range of palaeoecological information.

In Voorthuizen 34 samples have been collected and processed according to standard sample treatment technique (Golyeva, 2008). All samples were found to be suitable for analysis, with a sufficient number of microbiomorphs.

The results of the study not only allow to clarify significantly the archaeological interpretation of the site but also provides new information on the anthropogenic impact on the landscape. Microbiomorphic analysis manifests the genesis of the cultural layer and the several phases and types of anthropogenic use of the territory. The research also demonstrates the applicability of the
microbiomorphic (phytolith) analysis in the case of sandy archaeological layers.

References: