Joint seminar of the NPI of the CAS

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History written in pores – compound specific radiocarbon analysis of archaeological pottery

Compound specific radiocarbon analysis (CSRA) deals with radiocarbon dating of organic material at the molecular level. CSRA consists of separating the heterogeneous mixture isolated from a sample directly into individual representative molecules, so-called biomarkers, which are directly related to the original source in the sample and can be subsequently radiocarbon dated. This all has been possible with the advent of modern chromatographic techniques and especially of accelerator mass spectrometry (AMS), which significantly reduced required sample quantity for radiocarbon dating. Using CSRA, we can nowadays date organic volatiles from soils or sediments, collagen amino acids from heavily contaminated skeletal remains, and it has been also only relevant way how to date archaeological pottery. Namely through fatty acids separated from lipids which were adsorbed in the porous wall of the original vessels during their use in the past, i.e. cooking, storage, serving of food or during processing of other lipid-rich material. By combining modern analytical techniques, organic residue analysis and compound specific radiocarbon dating approach, the adsorbed lipids may thus tell us not only what food resources our ancestors processed in ancient pots, but also when in the past this occurred.