A new integrated approach to understanding household activity areas using phytolith and geochemical signatures from ethnographic and archaeological sites in Jordan

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The Neolithic in southwest Asia (~11,700-7800 cal BP) is a major period of human development, notable for its cultural and socio-economic transitions from hunter-gatherer to sedentary farmer. Despite this importance, archaeological sites, particularly those from the earlier Pre-Pottery Neolithic periods (~11,700-8250 cal BP), often prove difficult to interpret due to their ephemeral nature and the scarcity of biological remains. With the aim of establishing an integrated approach which will enable a better understanding of such sites, we have developed a method based on more durable forms of archaeological evidence that frequently result from human activity. This methodology integrates phytolith signatures (silica remains) and geochemical variations (traces of soil chemistry i.e. phosphorus) to help address the problems of interpreting early Neolithic settlement sites.

This approach combines analysis of phytoliths and geochemistry from ethnographic soil samples to determine if certain activity areas i.e. middens, hearths and floors, have particular phytolith and elemental signatures that can help us recognise these same areas in the archaeological record. We present here the results from one of the ethnographic settlement sites 'Al' Ma'tan'; an abandoned constructed stone and mud village. This site situated in Jordan was chosen because it provided the best available analogy for the more substantial Jordanian Neolithic settlement sites (i.e. Ain Ghazal, Beidha and WF16), which we are also analysing as part of this project.

These results are the first to explore how spatial activity patterns recorded from known abandoned households can be applied to samples from Neolithic archaeological sites in Jordan. We aim to maximise the information available from archaeological settlements by integrating distinctive, yet complimentary, datasets. The combined focus on both phytoliths and geochemistry is unique to this study as ethnographic research does not commonly integrate multiple sets of geoarchaeological site-based data.