

Phytoliths from Stone Tools: Understanding socio-ecological situation of North-Western South Asia in the third millennium

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4 minutes

Plants constitute a major economic resource for most societies yet plant-related activities are often underrepresented in the archaeological record. Understanding long-term management of plant resources is a necessary condition required to understand prehistoric economies; identify the emergence of agricultural practices and the modification of natural landscapes.

However, differential preservation of the archaeobotanical assemblage often complicates what is actually deposited and preserved, limiting what survives. Here phytoliths (plant silica) come to the rescue of archaeologists. Plants are widely known to silicify (specially cereals) and the mineralized cells are commonly referred to as opal phytoliths. These biomineralizations adhere to the edges of stone tools when the tools are utilized for processing of plants. As is well known, chipped stone tools and debitage often represent the most abundant form of artefacts found from prehistoric and protohistoric sites. In addition to the macroscopic examinations of stone tools, microscopic examination of residues adhering to tool surfaces may provide insights into tool use and environmental conditions.

Microliths are one of the most abundant types of lithic tools and are often considered diagnostic to attribute a site to the Mesolithic, a post-Pleistocene Stone Age culture characterized by hunting and gathering subsistence economy, which succeeded the Palaeolithic in Europe.

In the Indian subcontinent, however, the scenario is a little different. Even though, microliths are still considered the most diagnostic tools to chronologically attribute a site to the Mesolithic, microliths are abundantly found from Chalcolithic sites as well. Thus, it is often difficult to discern whether the microlithic tools found in Chalcolithic contexts were produced for local use or for trading with the neighbouring hunter-gatherers. Notwithstanding the difficulties in trying to attribute them to a specific community, what is clear is that Mesolithic/Chalcolithic lithic tools were utilized for an array of different functions and formed part of day-to-day life of prehistoric and protohistoric people. It has also been observed that even though microliths are recovered from all the Mesolithic and Chalcolithic sites, the frequency of tool types clearly varies between sites. These differences might be due to the different functions for which these tools were being utilised, something that has never been analysed in depth so far. The function of stone blades and the whole lithic set would be expected to change with the change in lifestyle from hunting and gathering to agriculture, potentially showing an increase in cereal processing. However, an argument has also been made that these tools might have been utilized for specific functions and that is the reason why they have persisted for such a long time span.

Attributing microlithic stone tools to hunting-gathering or farming communities based only on their typology disregards their differential use depending upon the different socio-economic strategies adopted by these communities. For example, distinctive gloss from cutting cereal grasses has been recognised on sickle blades. Such gloss has been observed on certain chert blades from a Chalcolithic context but they have not been identified conclusively as pertaining to a specific activity as it has not been possible to perform either functional or residual analysis. By applying these types of analysis and developing criteria to distinguish microliths belonging to a hunting-gatherer tool kit

versus microliths belonging to the agriculturalists tool kit and provide a breakthrough that is required to unlock the understanding of the archaeological record in north-western South Asia.

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Figure 1: Lithic tools from Chalcolithic sites of India.

A further important and unique (in South Asian context) aspect of *PAST*, is to attempt to understand the role of women in the past, in this case regarding stone tool production and utilization. Stone tools have been traditionally understood as male-related and this has produced a strong bias concerning how lithic assemblages are usually interpreted. It has been theorised, for instance, that tools associated with house-floor excavations are likely to be associated with women's work. Based on ethnographic observations, harvesting (with sickles) or collecting edible plants for consumption might have also been carried out by women. The distinct gloss from cutting cereal grasses has long been recognized on sickle blades and extensive investigations have demonstrated that micropolish is a good indicator of function, especially on fine-grained flints and cherts. In spite of this, lithics remain as a male-related artifact. The identification of gender division of labour in the past one of the big challenges of archaeological research and to

contribute to its resolution, PAST will make use of specialized literature as well as the Human Relations Area Files databases. The activities related to tool use (especially cultivation practices with sickles) will be analysed in relation to gender-specificity and the possibility to identify universal/regional patterns and understand which proxies would be necessary to correlate them with archaeological contexts

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