



Use-wear of worked bone objects from the Late Epipalaeolithic and Early Neolithic Levant to elucidate perishable material culture

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Perishable material cultures and worked bone industries

Perishable material cultures, such as textiles, basketry, and skin working, have remained enigmatic throughout most of prehistory, and have largely been overlooked due to issues with preservation and academic partiality. The aim of my PhD project is to explore crafts associated with perishable material cultures through use-wear on worked bone items from several Late Epipalaeolithic and Early Neolithic sites in the Levant. The sites represent important stages from the Natufian to the Pre-Pottery Neolithic A and Pre-Pottery Neolithic B periods, allowing for an interpretation of the role of perishable material cultures during the Neolithization process. The transition between the hunter-gatherer Epipalaeolithic and the agrarian Neolithic is characterized by new ways of engaging with plants and animals, resulting in co-habitation and domestication. This project endeavors to investigate whether this development and new ways of interacting with the environment is represented in changes occurring in the perishable material cultures from what can be deduced from worked bone objects.



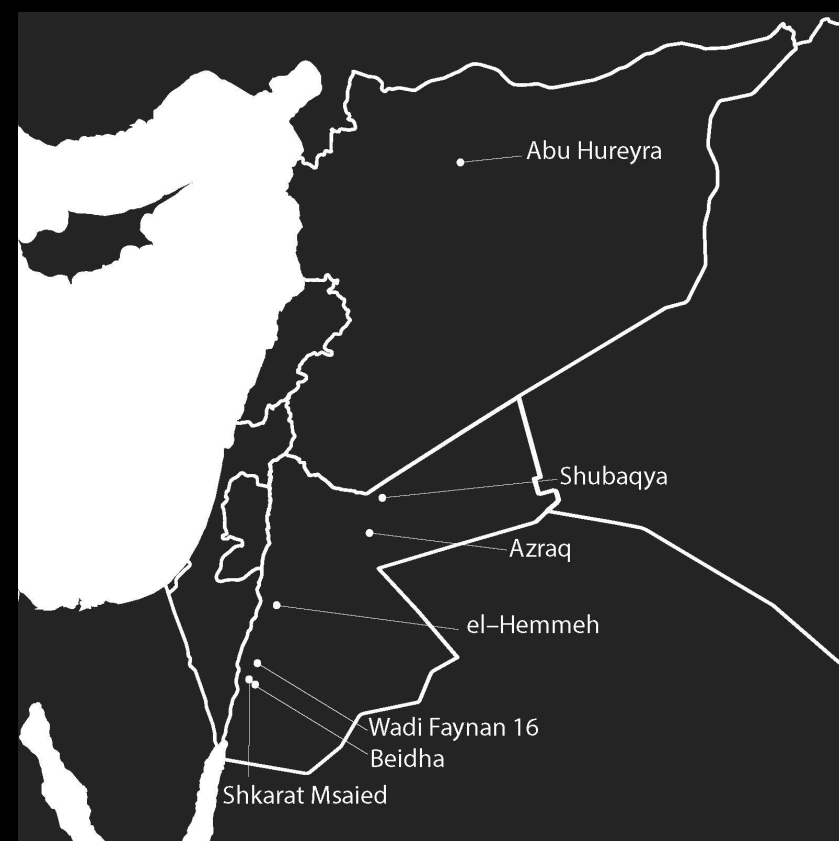
Manufacturing and using experimental worked bone replicas

Methods

The use-wear analysis will be based on microscopy, building on a reference collection of experimental replicas utilized with different crafts on different animal and plant materials. Micro-wear will be undertaken using a high-powered light microscope, a Leica DM2700M and Leica Application Suite (LAS) for processing. Initial experimental work has produced significant differences in the use-wear attributes based on the contact material, further experiments will expand on these and supplement with different gestures and craft techniques. Ongoing work will endeavor to explore quantifying micro-wear attributes such as polish in order to evade subjective descriptions and aim to increase reproducibility and consistent protocols. To improve use-wear analysis for challenging aspects such as polish, a potential approach is Reflectance Transformation Imaging (RTI) which is well suited to document reflective, smooth, or polished surfaces and allows for analysis from multiple areas adding flexibility to the confined microscopic analysis.



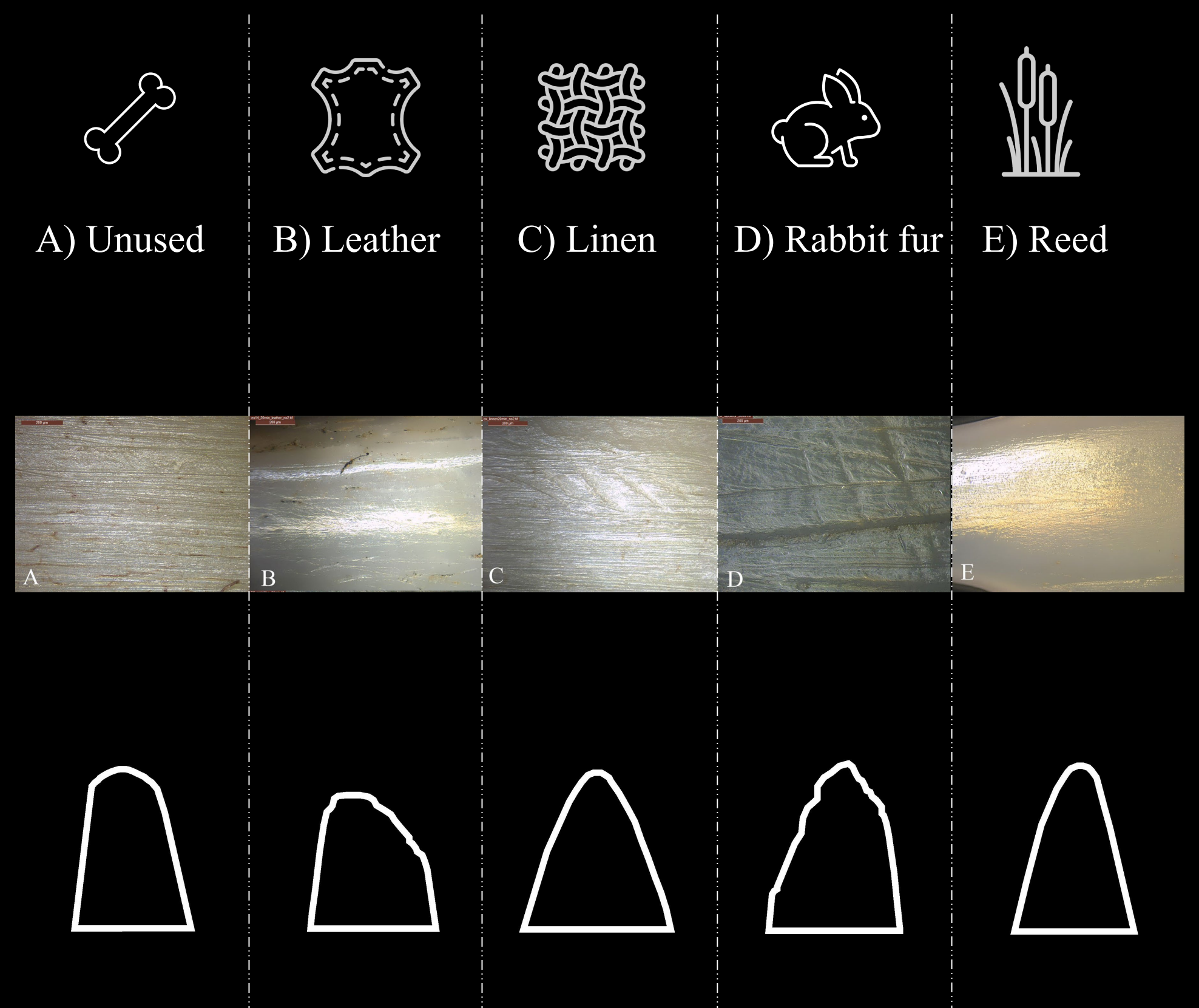
Various worked bone objects from Shubayqa 6



Map with the location of the sites included in the study

Objects fashioned from perishable materials comprise the far majority of material culture, and based on modern ethnographic examples from forager groups estimated to encompass up to 95% of all material culture. Yet they are predominantly absent from the prehistoric archaeological record as well as the academic perception. Although many perishable material crafts leave no durable tools behind, the presence of worked bone objects provides the opportunity to investigate these perishable material cultures and can provide new holistic frameworks for understanding the social, cultural, and economic nuances of prehistoric settlements, as well as raising awareness of its importance in the archaeological worldview. Previous research into the use-wear of Natufian and Early Neolithic worked bone objects have demonstrated functions predominantly connected to perishable materials with crafts such as textiles, skin working and basketry and only few examples of use connected to hunting, fishing, and gathering

20 minutes of piercing experimental replicas through materials:



Outline of tip shape after use