

Interdisciplinary study of archaeological wood. Ritual objects in three caves of Morelos-Mexico.

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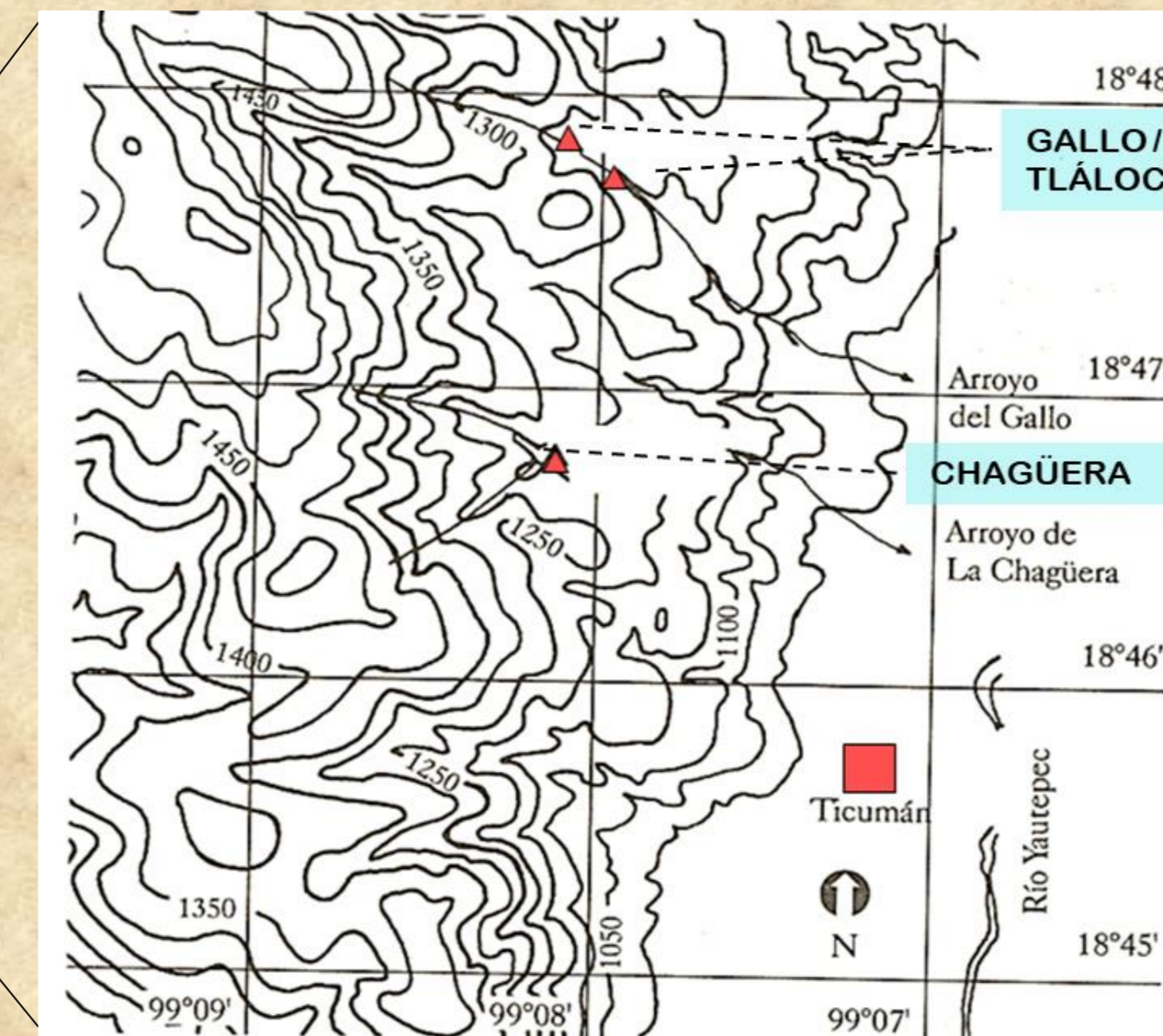
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WHAT TO KNOW ABOUT

The importance of the current investigation relies on the integral study of the wooden ritual implements which were recovered in agrarian offerings from Formative inside three caves: Gallo, la Chagüera and Tlálóc, in the state of Morelos.

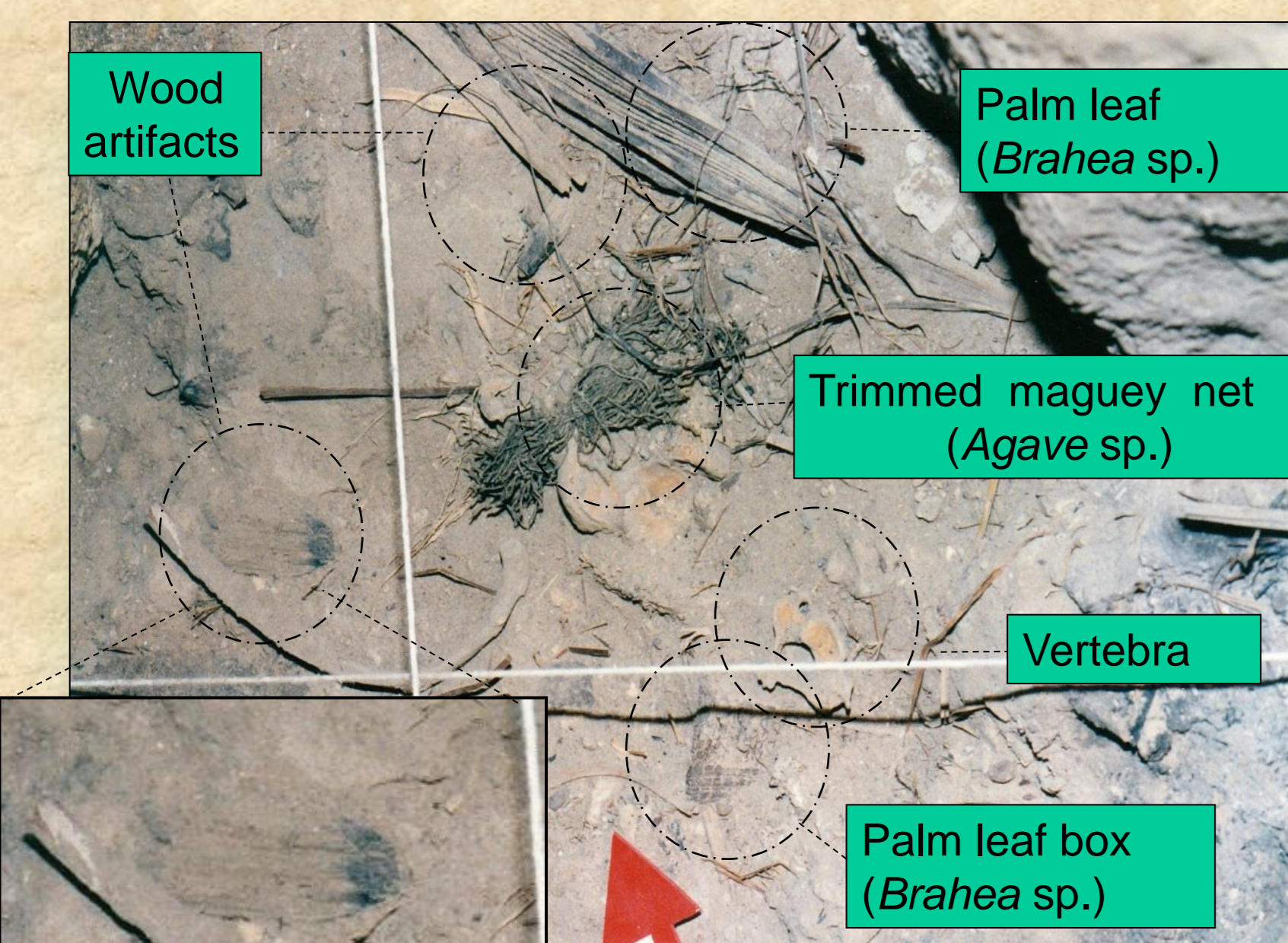
Objective

❖ Supported by paleoethnobotany, experimental archeology, the Scanning Electron Microscope (SEM), and the implementation of a 3D scanner, we are looking to establish not only the materials used to elaborate the implements, but also the probable places where the raw material was obtained as well as the manufacture techniques and the amount of time invested in the elaboration process. All of this to open a new perspective for investigation on archeological wood.



- The caves are located northwest of the town of Ticumán - Morelos.
- Used during Formative Period as a ritual places (400 a.C. - 200 d.C.)
- The agrarian offerings located inside the caves were conformed by more than 10,000 botanical elements.
- As part of these elements, more than 700 wooden artifacts were recovered.

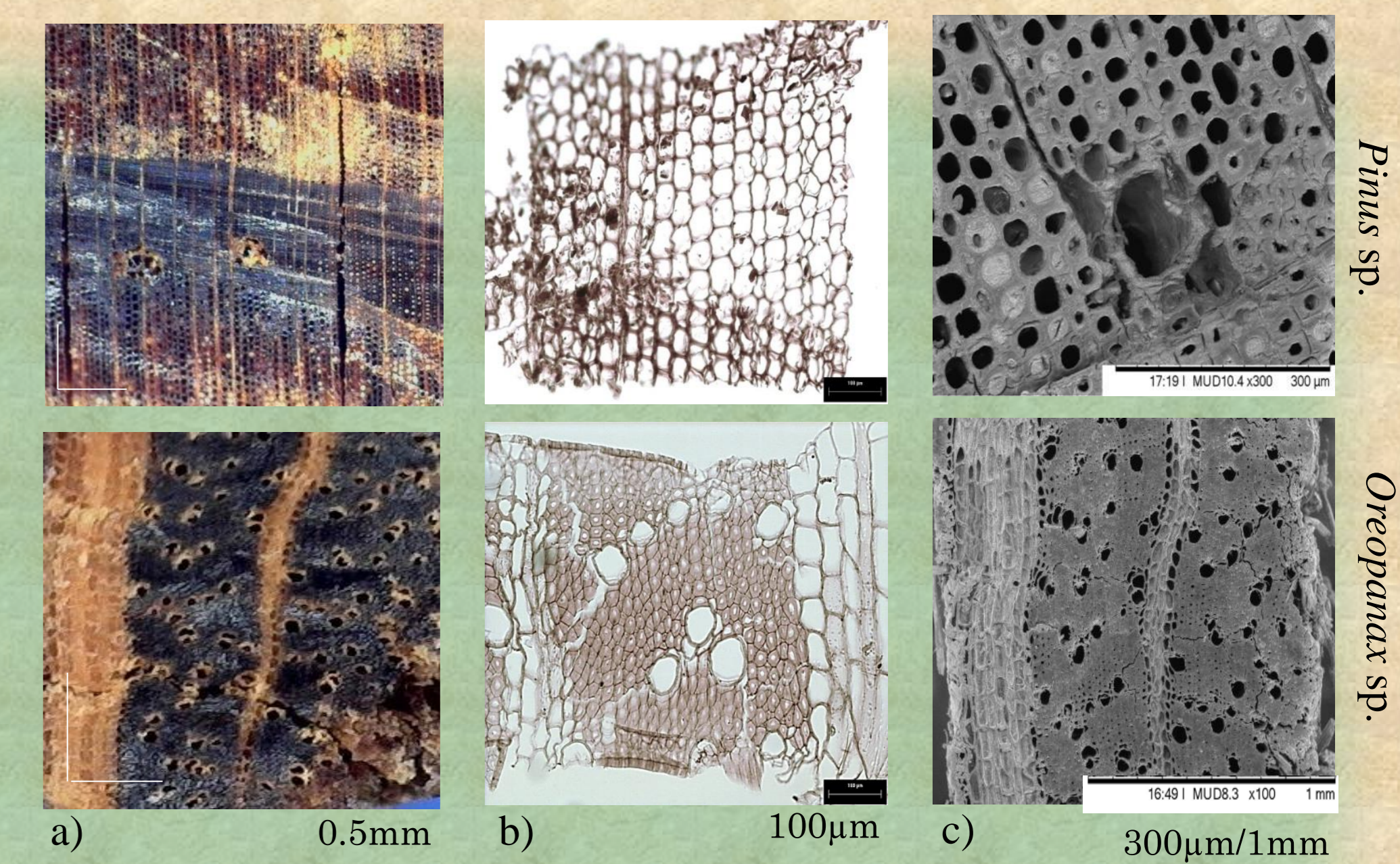
THE OBJECTS AND THEIR STUDY



Example of the agrarian offerings found in Chagüera cave

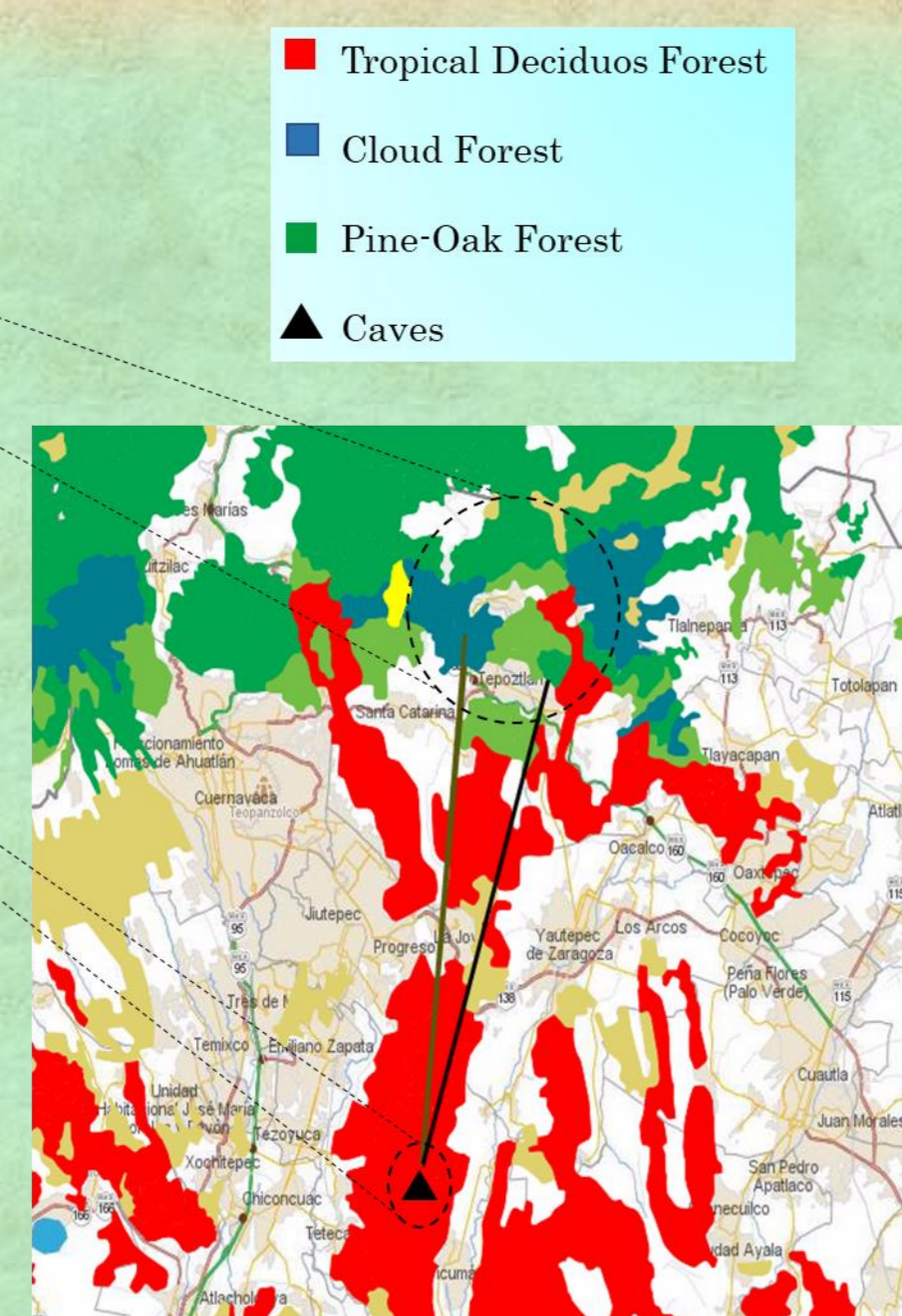
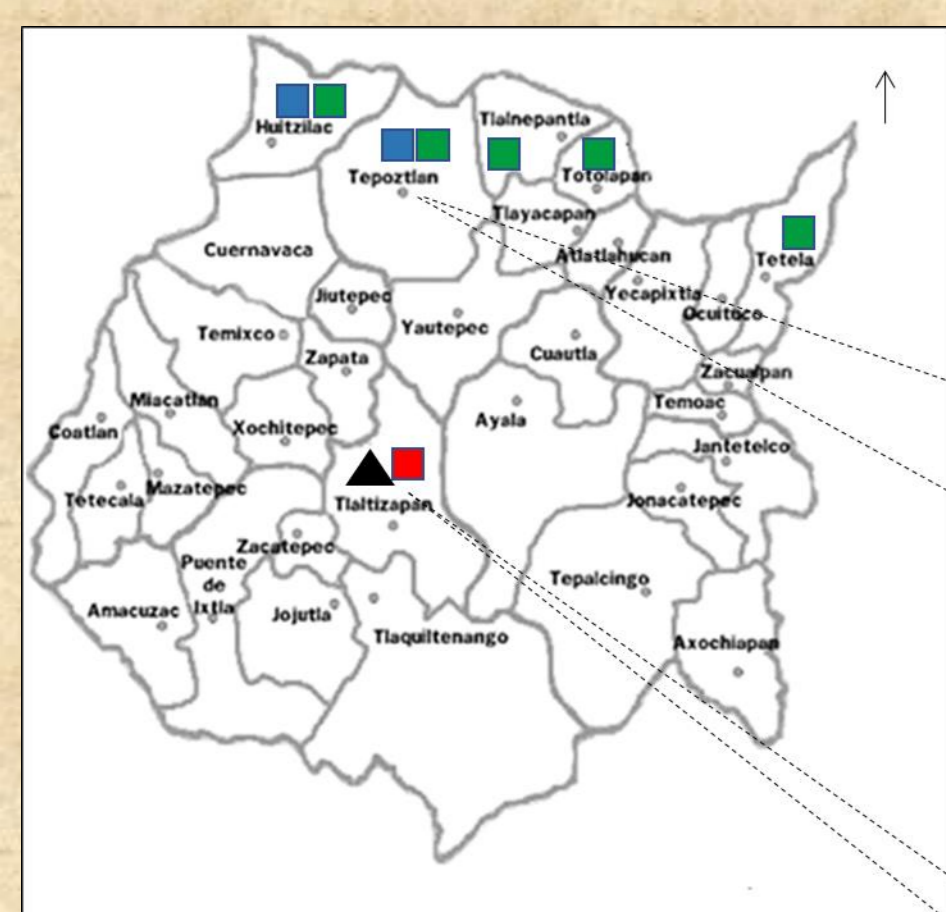


Different types of wooden artifacts found in the three caves
photographic register using a 3D scanner

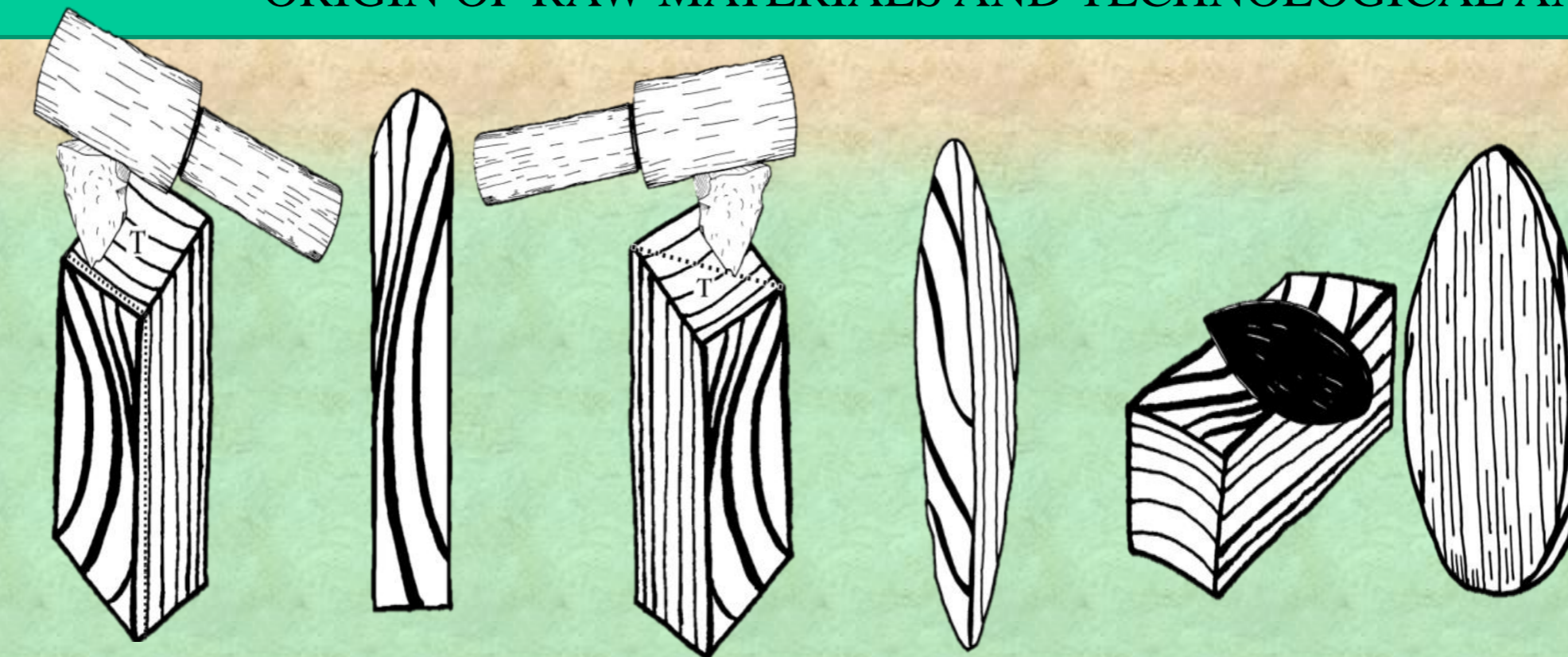


Examples of the botanical identification using: a) stereoscopic, b) optical and c) scanning electron microscope

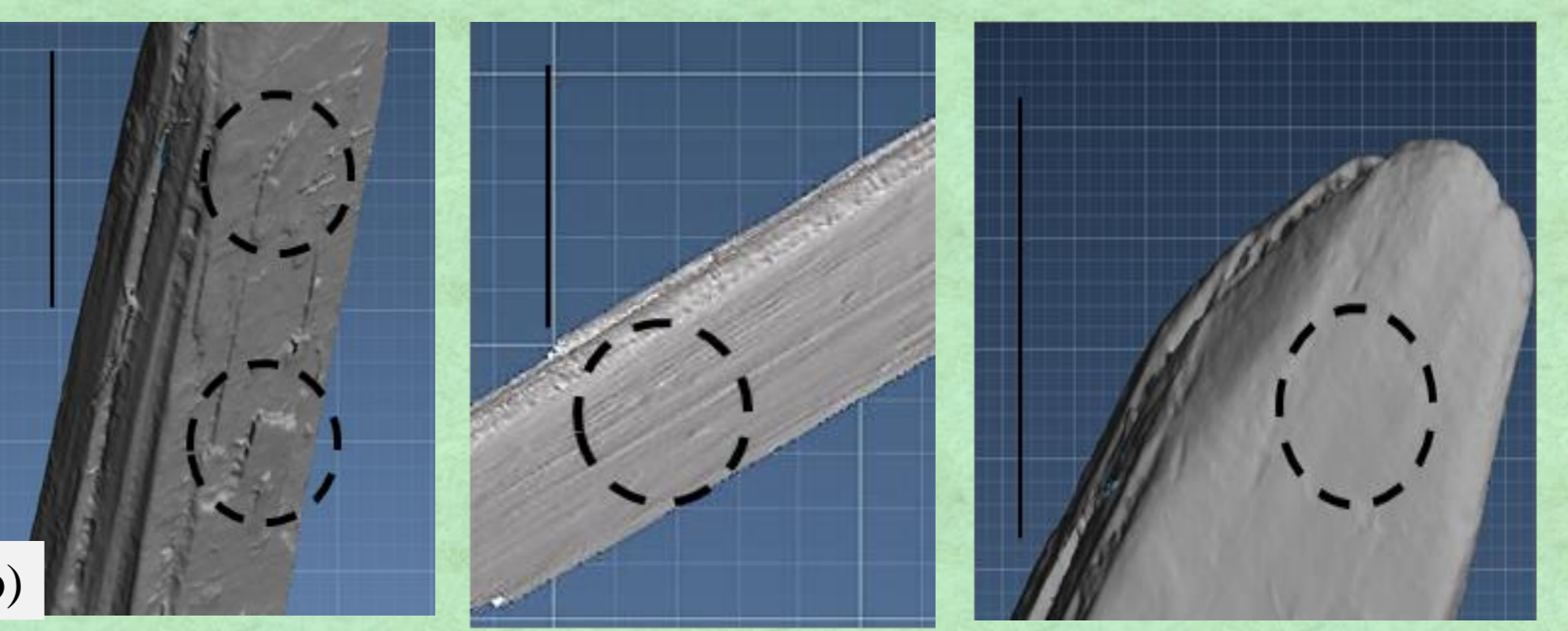
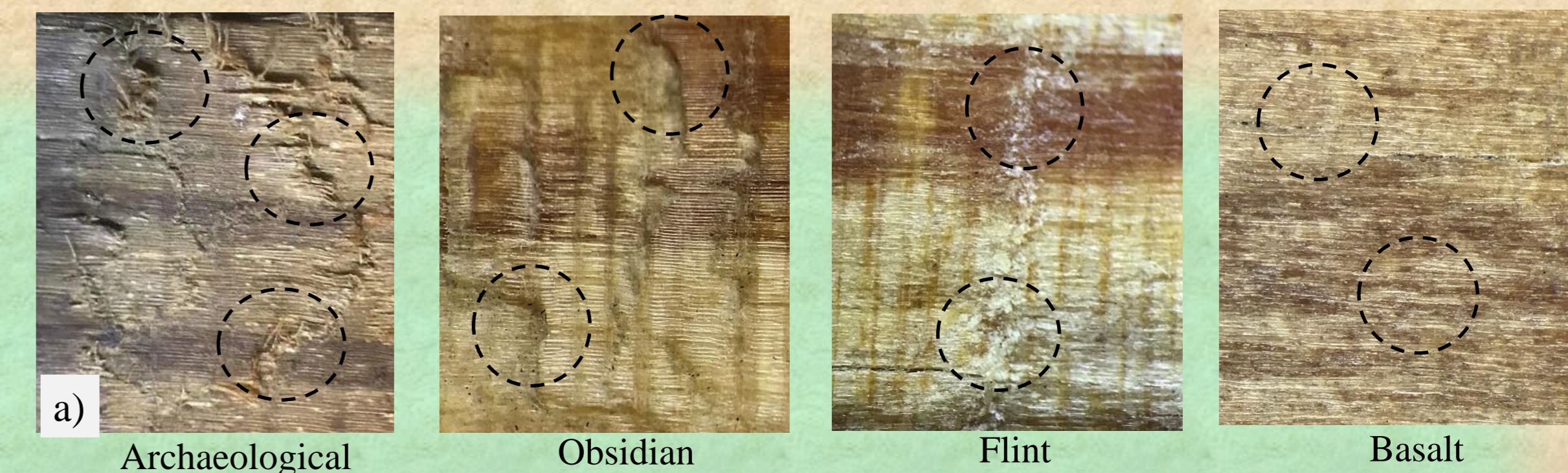
ORIGIN OF RAW MATERIALS AND TECHNOLOGICAL ANALYSIS



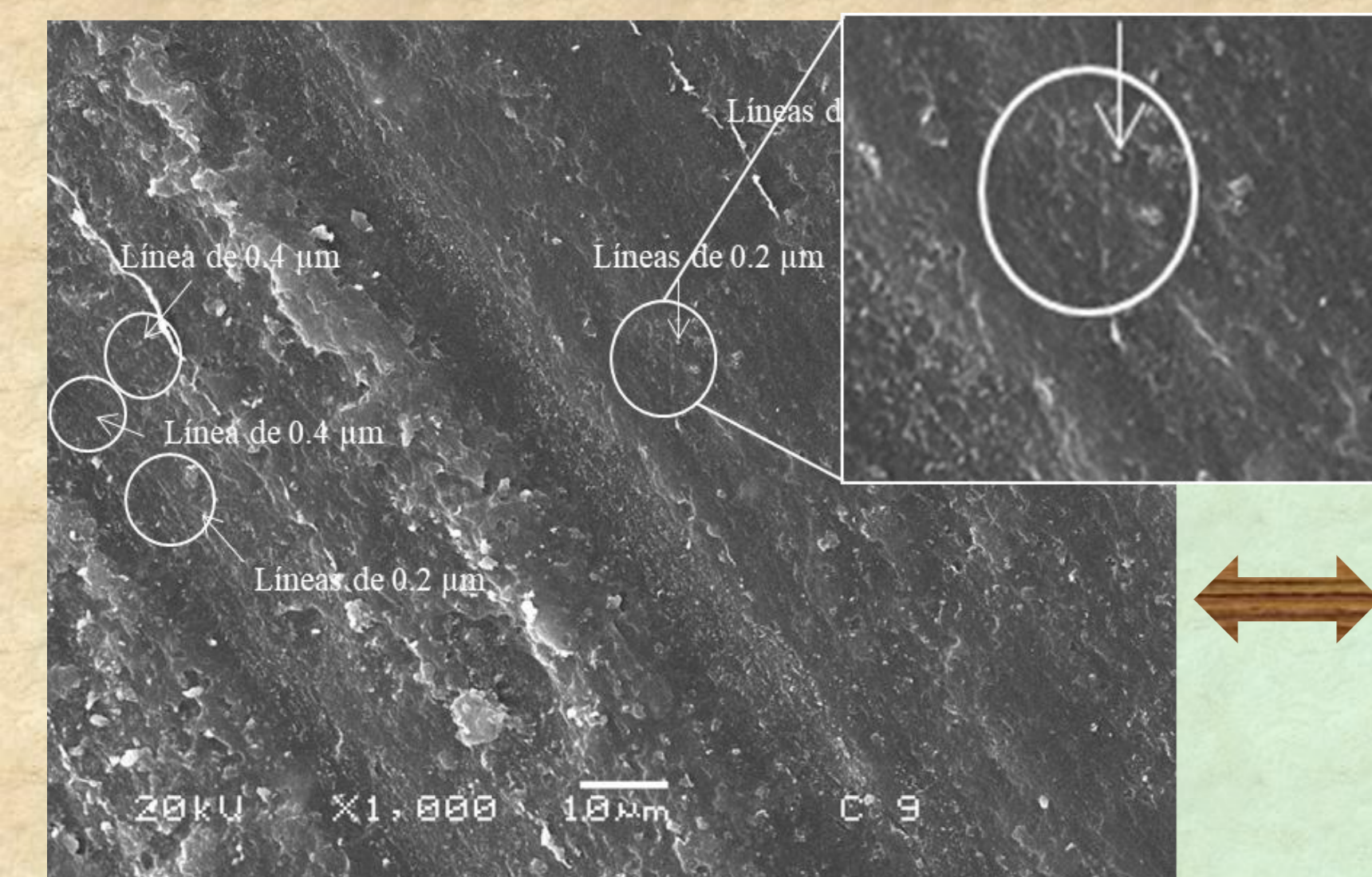
90% of the resources used in the manufacture of the wooden artifacts were allochthonous and come from the high areas of the state of Morelos, such as the Pine-Oak Forest



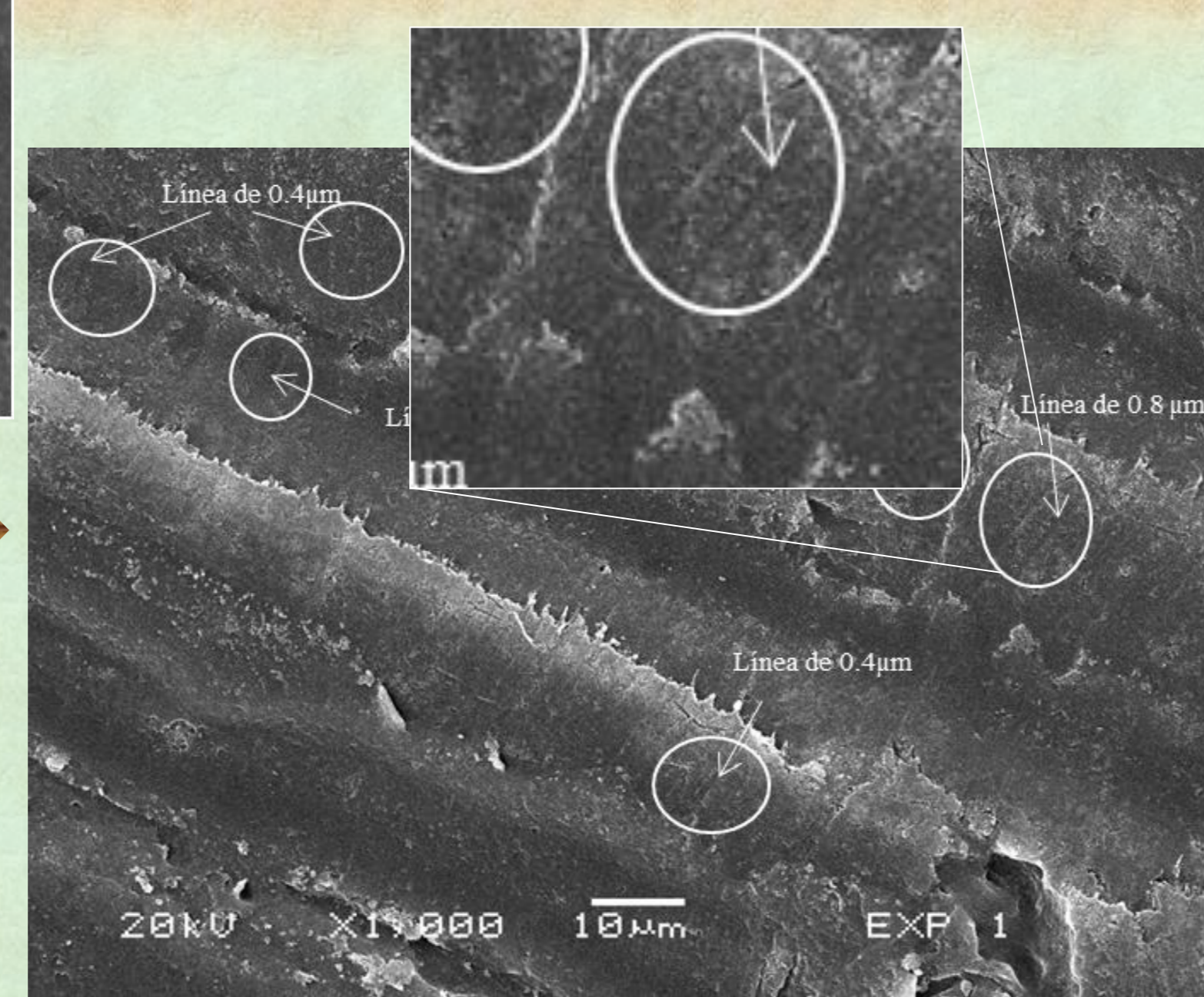
Reproduction of archaeological artifacts and abrasion process working with a) obsidian, b) flint and c) basalt instruments in order to obtain manufacturing traces



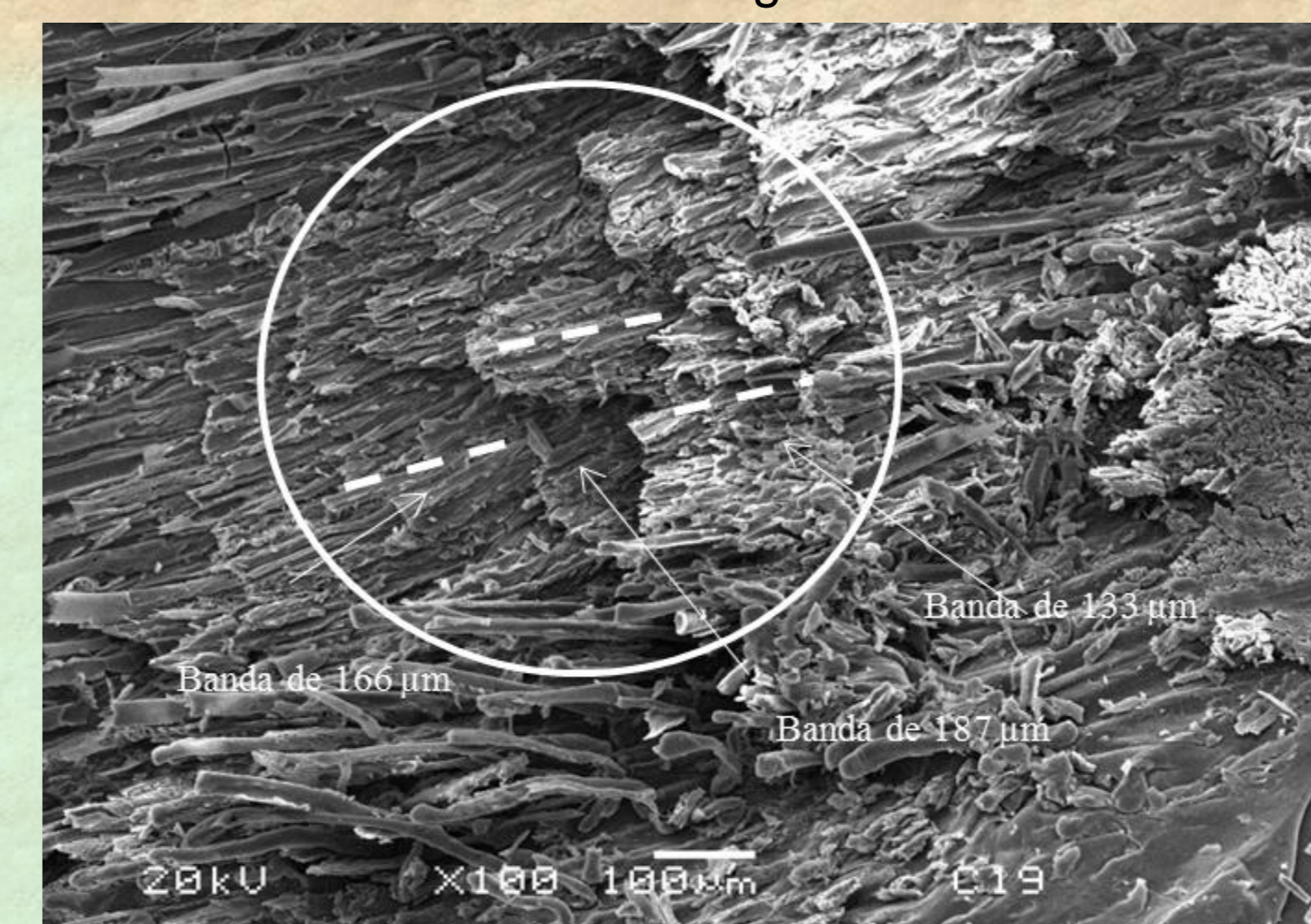
Characterization and comparison of manufacturing traces using: a) stereoscopic microscope, b) 3D scanner



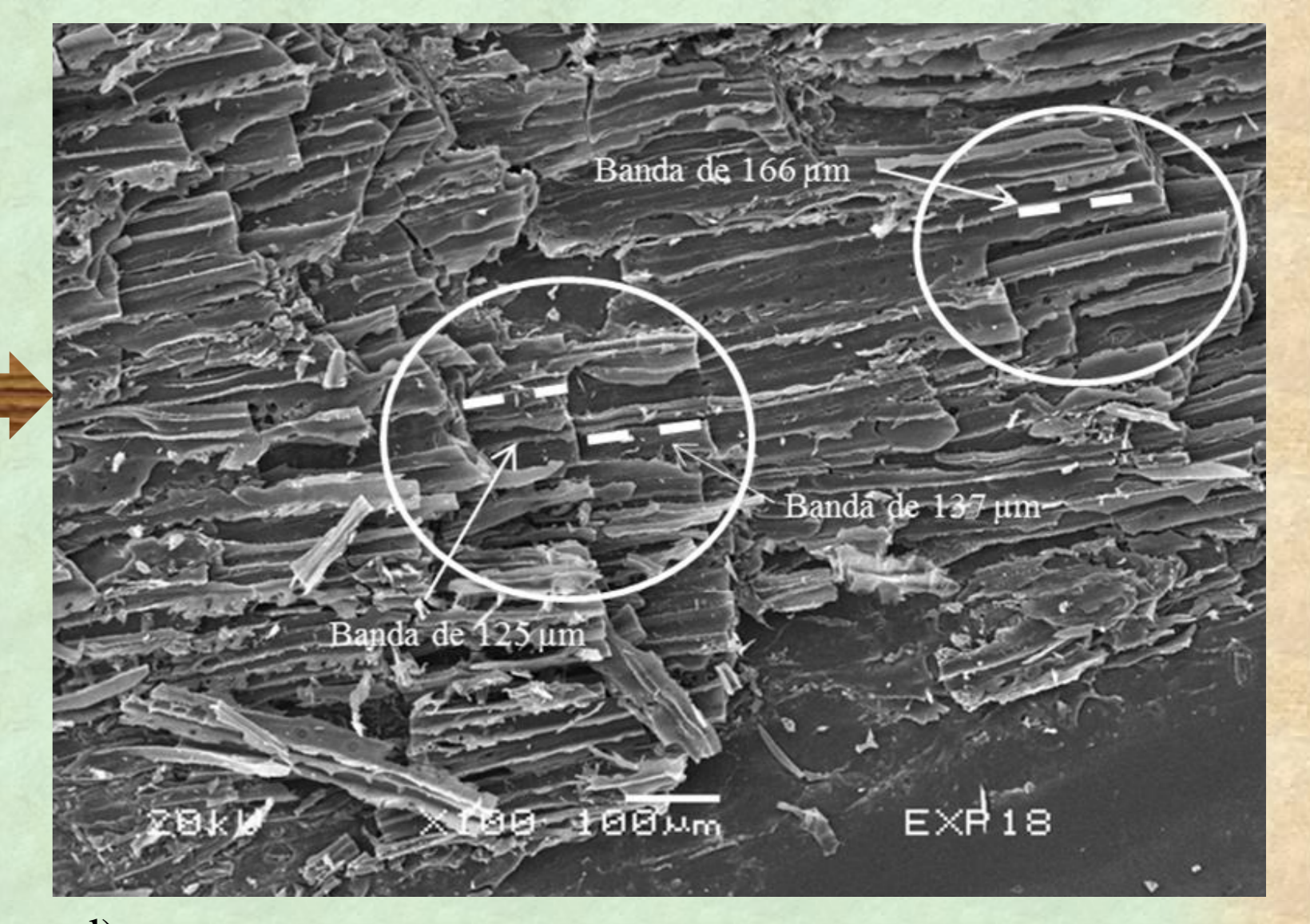
Abrasion traces seen with SEM at 1000x / "body" of the artifact : a) archaeological, b) obsidian
In both cases is possible to see lines in the range of 0.2-0.8 μm



b)



Abrasion traces seen with SEM at 100x / "tip" of the artifact : c) archaeological, d) basalt
In both cases is possible to see bands in the range of 130 - 160 μm



d)

OVERVIEW

The results point towards an intensive use of pinewood as an essential part of the offerings. It is interesting to note that the closest coniferous woods or Pine-Oak Forest, are located to an approximate distance of 40 km. This leads to the conclusion that in order to perform the rituals inside the venues, there was a definite concern to obtain allochthonous resources. Finally, the data collected after the technological analysis revealed the use of obsidian (allochthonous material) and basalt instruments to manufacture the objects, factor which is added, together with the selection of raw materials and working techniques, to the standardized elaboration process of the implements offered in the three caves during the Formative Period.

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