In 2003, a savage archaeological project in El Salitre—an area nearby Tula de Allende, Hidalgo, Mexico—discovered a rich funerary complex of a single individual, whose was composed by ceramics, shells, metallic rings, and other artifacts; a context associated to Toltec Culture (800-1250 AD)[1]. Due to their opulence, variability, and physical condition, the Salitre Funerary Complex was subsequently incorporated into an interdisciplinary conservation project that involves both research and preservation strategies. One of the most interesting characteristics of this burial was that red and blue pigments covered the human remains, a trait registered both in situ and during its micro-excavation. Characterization of these pigments became relevant for investigation due to their brilliant color, coexistence, and association in the archeological context. To be true, red pigment (i.e. cinnabar and/or hematite) has been found in several Pre-Columbian funerary contexts [2,3,4]. Blue pigment is fairly common in Mesoamerican mural paintings and ceramics (6,7,8,9); however, no record has been yet located regarding its use in funerary practices. Therefore, the composition, origin and possible meaning of these pigments became a matter of scientific enquiry. Portable non-invasive techniques have proved useful for archaeological heritage analysis, but present limitations. Regardless of being considered destructive, electron microscopy is essential for heritage material analysis worldwide. In fact, the use of electron microscopy has turned into a rich venue of research in archaeology, art history, and conservation. This paper presents an interdisciplinary contribution to material analysis of Mesoamerican archaeology, which is mainly based on electron microscopy. Samples of red and blue pigments found in Salitre Funerary complex were analyzed using various microscopy techniques—optical (OM), scanning electron microscopy (SEM), Z - Contrast, SAED, HRTEM—in order to identify and characterize the components, and thus, answer questions raised by archaeologists and conservators.

References:

Acknowledgement: We are grateful to Arqlogo. Juan Carlos Equihua, coordinator of the El Salitre Archaeological Project (Centro INAH Hidalgo), Dr. Josefina Bautista (DAF-INAH), both of them collaborators of El Salitre Integrated Conservation Project (ENCryM-INAH) and ININ - Electron Microscopy Facilities - Project TM-002.
Fig. 1: a) Image from the single individual burial offering at “El Salitre” Tula, Mexico; b) optical micrograph of the blue pigment; c) TEM micrograph where nanofibres can be observed and d) SAED ring pattern from region “A”-figure 1c-, interplanar distances correspond to the palygorskite crystalline phase.