SEM TECHNOLOGY FOR THE ANALYSIS OF TINY CALCIFIED REMAINS FROM A PREHISPANIC BURIAL FROM EL HIERRO (CANARY ISLANDS).

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Résumé

Careful excavation of archaeological sites is a crucial procedure to obtain information about socioeconomic conditions and style of life of past populations. The recovery of seeds, phytoliths, and the remains of microfauna and microflora coupled with micro-sedimentological analyses of soil samples provides detailed information about diet and also allows radiocarbon dating. In the case of burial sites, minute calcified remains may be recovered after sieving the sediment around the corpses. Differential diagnosis constitutes a major challenge, since the list of tiny calcified structures is enormous. Some of them may belong to gallstones, renal calculi or sialoliths or may even correspond to sesamoid bones. A proper identification of the exact nature of these calcified remains is mandatory, since they may provide important insight into disease, diet, and everyday life. In recent years we have tested the ability of scanning electron microscopy (SEM) equipped with an energy-dispersive X-ray spectroscopy detector to precisely identify the composition and structure of these tiny calcified remains. In the present study we have applied this methodology to the analysis of three different small calcified structures, recovered during the excavation of a large collective prehispanic burial from El Hierro, one of the Canary Islands. The three samples (1-3), measuring 7, 12, and 6 mm, showed a relatively smooth outer surface. Spectroscopic analysis revealed that composition of sample 1 is compatible with hydroxyapatite (Ca5 (PO4)3 OH: Phosphorus= 7.15%; calcium 11.49%; oxygen =46%, with also probably some salts of magnesium (0.7%) carbonate and sodium (0.6%) bicarbonate and organic structures (collagen?). SEM image showed bony trabeculae, so, both by SEM image and chemical composition it probably corresponds to a sesamoid bone. Analyses of samples 2 and 3 are still in process, but they possibly correspond to a nephrolith and a complex mineral silicate. Thus, we confirm that SEM analysis is a useful tool in the identification of small calcified structures recovered during the excavation of a burial site.

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