

## Analysis of Organic Residues Preserved in Archaeological Pottery and Soil from Jordan

Abdulraouf Mayyas  
Associate Professor in Archaeological Science  
(Archaeometry)  
Department of Conservation Science  
Queen Rania Faculty of Tourism and Heritage  
The Hashemite University–Jordan  
A.S.Mayyas@hu.edu.jo

Khaled Douglas  
Associate Professor in Archaeology  
Department of Archaeology  
Faculty of Art and Social Science  
Sultan Qaboos University  
Sultanate of Oman  
khalidd@squ.edu.om

### Abstract

Analysis of organic residues preserved in archaeological materials, such as pottery and soils, can provide useful data on the natural materials exploited in the past for different purposes, including diet and other daily uses. Furthermore, data on the function and use of pottery vessels can also be obtained. This paper provides examples on the importance of the analysis of organic residues preserved in pottery and soils from two archaeological sites in Jordan. The main goal of the analysis is to identify the nature and origins of organic residues that cannot be characterized using traditional techniques of archaeological investigation, because they are either amorphous or invisible. The identification however, is based on the detection of biomarkers, which are components of organic materials of natural origin associated with human activity. They survive in a wide variety of locations and deposits at archaeological sites. These biomarkers can be characterized upon the principles of chemotaxonomy, in which the biomarkers in an unknown sample are matched with their presence in a known contemporary or modern natural substance. Conventional solvent extraction and alkaline hydrolysis (saponification) are used to extract organic residues. The analytical organic chemical technique of gas chromatography – mass spectrometry (GC–MS) is the main technique usually used for the analysis.

*Keywords:* Organic residues, Lipids, Fatty acids, Acylglycerides, Biomarkers, Archaeology, Gas chromatography – mass spectrometry (GC–MS), Pottery, Vessels, Soil.