# Fuel for Lamps: Organic Residues Preserved in Iron Age Lamps Excavated at the Site of Sahab in Jordan

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## Abstract

Five Iron Age ceramic lamps from the site of Sahab in the south-eastern part of Central Jordan were tested concerning the preservation of organic residues using gas chromatography – mass spectrometry (GC-MS) technique. Conventional solvent extraction and alkaline hydrolysis (saponification) were used for extracting residues preserved in their interior fabrics. GC-MS analysis revealed significant preservation of lipid constituents, mainly straight and branched chains of fatty acids, dioic- and dihydroxy- fatty acids, in addition to long mid-chain ketones, cholesterol, cholesterol oxidation products and both mono- and di- acylglycerides. The results of this study provide data on the type of the fuel used in these lamps, which is animal fat of ruminant origin in three Early Iron Age II lamps and maybe plant oil in the other two Iron Age I lamps. The results are also in conjunction with the archaeological evidence on the availability of domestic ruminant animals and most likely use of their products at the site of Sahab during the Iron Age.

***Keywords:*** Lipids, Fatty acids, Acylglycerides, Gas chromatography – mass spectrometry, Vessels, Lamps, Cave, Tomb, Sahab