Containers and Commodities in the Age of the Dead Sea Scrolls: A Chemical Analysis of Several Small Levantine Vessels and their Contents

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Background
This interdisciplinary study examines a diverse typological selection of ceramic vessels from relatively unknown provenance from Brandeis University's Classical Artifact Research Collection (CLARC) using both archaeological and chemical analyses to better understand life in ancient times through their historical context and content.

Chemical Analysis
Organic Residue
Using the Archaeometry Research in the Eastern Mediterranean (ARCHEM)'s proven dual organic extraction technique, objects B2-5 were washed with heated DCM and the resulting mixture was filtered and collected, before subsequent extraction with ethanol to produce two samples per object. Each sample residue was concentrated by rotary evaporator and redisolved in THF for analysis by Gas Chromatography-Mass Spectroscopy (GC-MS), which may yield spectra indicating the chemical composition of the container's ancient contents (key GC peaks noted).

Scanning Electron Microscope (SEM)
In collaboration with the MFA, an inorganic analysis was also conducted. By using ceramic sherds, thin sections were created and examined with a Scanning Electron Microscope (SEM).

Meeting with Dr. Newman of the MFA to discuss analysis.

The microscope scans with focused beams of electrons that interact with the specimen's surface, yielding information about the ceramic composition and chemistry.

A blotch of red pigment remains on the lip. Similar shapes have historically been used for jars. Holes around the rim were added for attaching a lid. Scratches around the lip indicate the base on which it was filled to dispense contents. Some residue is insoluble in THF and additional GC-MS samples were made in other solvents. Contains major chemical components found in honey, though it varies by locality and plant species. The shape complements this finding, as it would have been difficult to dispense due to the viscosity of honey.

Perfume Vial – B2

Size: 7 cm
Appearance: Pinkish clay with irregular, “drawn,” black cross-hatch design
Technology: Hand-molded
Provenance: Unknown
Analysis: UV analysis shows yellow-rectangle on body – price tag? Extraction revealed glue inside the neck, which appears to have been retouched/crooked.

Likely of Roman-Syrian origin due to presence of Strzyger components, mentioned in Pynny Natural History 12.55. Has traces of floral and spice compounds like docosane and linool, which suggests it was used to hold perfume.

Egyptian-Style Jar – B3

Size: 9.7 cm
Appearance: Tan clay, red paint at rim with ridges
Technology: Wheel-spun
Provenance: Unknown
Analysis: A blotch of red pigment remains on the lip. Similar shapes have historically been used for jars. Holes around the rim were added for attaching a lid. Scratches around the lip indicate the base on which it was filled to dispense contents. Some residue is insoluble in THF and additional GC-MS samples were made in other solvents. Contains major chemical components found in honey, though it varies by locality and plant species. The shape complements this finding, as it would have been difficult to dispense due to the viscosity of honey.

Jug Fragment – B6

Size: 14.9 cm, max: 30 cm
Appearance: Smoothed grey clay, rocky, porous, with ribbing and a “folded” lip
Technology: Wheel-spun
Provenance: Of the Susman donation
Analysis: May have been a single or double-handled vessel. Probably stored water, olive oil, or wine. The SEM shows the object is also from the Sea of Galilee region with a larger Quartz content, though they are not likely the same vessel.

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