

## The investigation of organic residue from old ceramic dish surface

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### Abstract

The organic remains from the surface of a ceramic dish found during the Central Asian historical and domestic expedition in 1952 were investigated in this work. The dry fat samples were extracted with solvents and then were derivatized to obtain volatile derivatives. Derivatives were analyzed by gas chromatography with flame ionization and mass spectrometric detectors.

The mutton fat was identified according to the results of fatty acids composition analysis and the ratio of saturated fatty acids (FAs).

The high content of oleic acid and its oxidation products: azelaic acid, pimelic acid and pelargonic acid were identified in FAs composition of organic residues from dish surface. The azelaic and pimelic acids contents were significantly exceeded the content of pelargonic acid, which is typical for vegetable oils. It was suggested that the residues studied were a mixture of animal fat and vegetable oil.

In studied fat residues various sterols were found and identified by gas chromatography and mass spectrometry: cholesterol,  $\beta$ -sitosterol and squalene. The presence of cholesterol confirms the presence of animal fat. Detection of  $\beta$ -sitosterol and squalene allowed to suggest, that the sesame oil was used for the preparation of pilau.

Thus, this investigation are allow to specify the ancient ceramic artifact attribution, such as dishes for serving cooked pilaf made from rice, lamb fat with sesame oil addition, which indicates a high development of pilau cooking technology.

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