

RHODOS : Metabolomic analysis of amphora organic content



Site of stara Danashna, Apollonia pontica. 250-150 BC

First lipid extract, medium to high concentration. We identify:

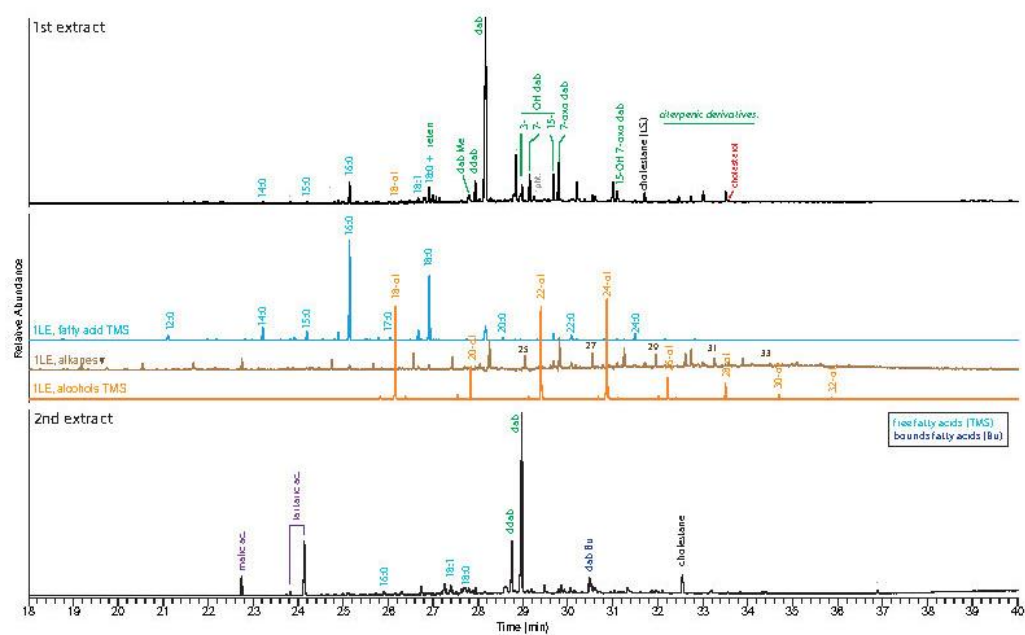
- conifer pitch: free and methylated dehydroabietic acid, associated with retene and its degradation products by natural oxidation;
- a small quantity of fats of animal origin (cholesterol, sitosterol not detected). DAGs from dairy products are absent, as are the characteristic isoprenic acids. This is more likely to be a non-ruminant animal fat.

Vegetable waxes and plastic pollutants are negligible.

The second extract is highly concentrated and characterized by :

- abundant conifer pitch;
- very abundant tartaric acid, associated with malic acid (cTar 15.19 $\mu\text{g/g}$, Mal/Tar 0.70), with no syringic acid detected, corresponding to white grapes;
- no trace of alcoholic fermentation acids (only pyruvic acid is present).

Conclusion. – The Rhodian amphora was abundantly waterproofed with conifer pitch and contained white grapes. Fermentation markers were not detected and do not indicate a white wine. If these were never present, the grapes would have been dried white grapes or white grape juice concentrated into syrup by evaporation (ancient defrutum or modern-day petimezi in Crete).



Chromatograms of the first and second lipid extracts obtained from impregnations of the Rhodian amphora, trimethylsilylated (ZB5-MSi column, Exactive detector mode EI 70 eV resolution 60k).