



COS : Metabolomic analysis of amphora organic content



Ribarska str., 19. Apollonia pontica. End of the 3rd – 2nd c. BC

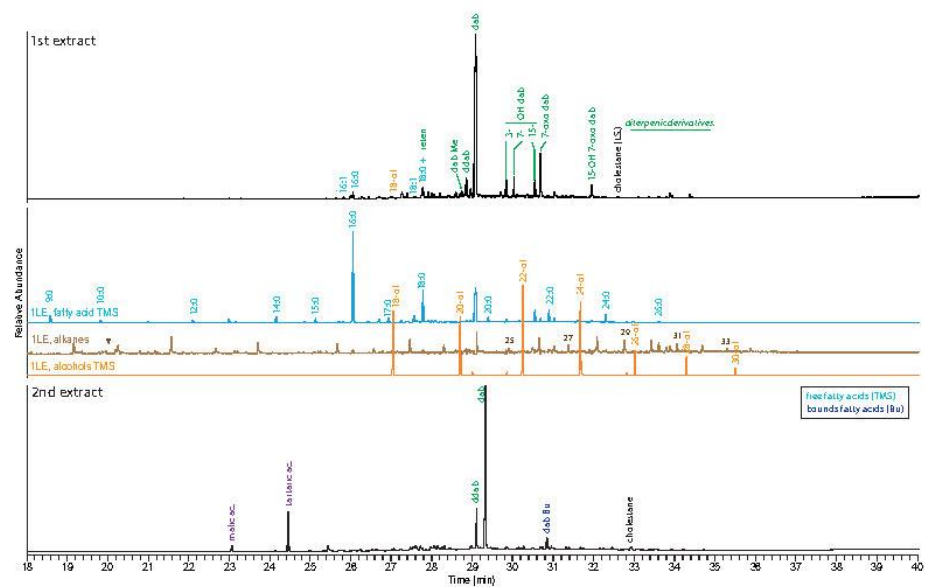
Highly concentrated first lipid extract, composed almost entirely of conifer pitch markers: free and methylated dehydroabietic acid, combined with retene and its degradation products by natural oxidation, characterizes conifer pitch. No other lipidic material is actually present in significant quantities.

The second extract is characterized by :

- the markers of conifer pitch (free, methylated and butylated dehydroabietic acid);
- very abundant tartaric acid (cTar 76.40 $\mu\text{g/g}$, Mal/Tar 0.33, syringic acid too low in concentration to indicate the real presence of malvidin), characteristic of white grapes;
- only pyruvic acid is detected among the acids of alcoholic fermentation.

Either the acids disappeared (although pyruvic acid would not have been the only acid selectively preserved), or they were not present. In this case, the amphora contained a white grape that did not ferment. However, the yeasts present on the grape skins cause the grapes to ferment spontaneously as soon as the skins are split. The other way to preserve grapes without fermentation is to dry them. The amphora would have contained either dried white grapes or white grape juice concentrated into syrup by evaporation (ancient defrutum or modern-day petimezi in Crete).

Conclusion. - Cos amphora APO 274, heavily waterproofed with conifer pitch, contained either dried white grapes or white grape juice concentrated into syrup by evaporation (ancient defrutum or modern petimezi in Crete).



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