



## CNIDOS

### 1. Metabolomic analysis of amphora organic content



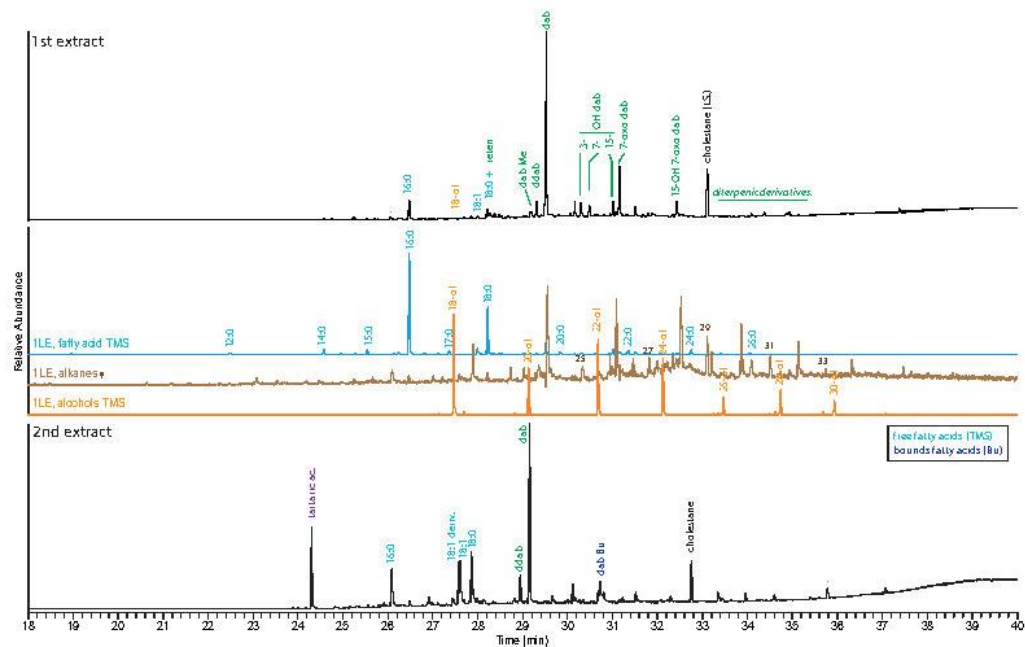
Ribarska str., 19. Apollonia pontica. End of the 3<sup>rd</sup> – 2<sup>nd</sup> c. BC

The first highly concentrated lipid extract is essentially composed of conifer pitch markers: free and methylated dehydroabietic acid, combined with retene and its degradation products by natural oxidation, characterizes conifer pitch. No other lipid materials are present in significant quantities. Vegetable waxes and plastic pollutants are very low.

The second extract is characterized by :

- conifer pitch markers (free, methylated and butylated dehydroabietic acid);
- very abundant tartaric acid (cTar 19.70 µg/g, Mal/Tar 0.03, syringic acid too low in concentration to indicate the real presence of malvidin), characteristic of white grapes;
- no trace of alcoholic fermentation acids.

Conclusion. - Cnidian amphora, heavily waterproofed with conifer pitch, contained 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).*