LEAD ISOTOPIC CHARACTERISATION OF ANTHROPISATION IN A MEDITERRANEAN ANCIENT HARBOUR

Regional and global atmospheric lead pollution by ancient mining and smelting was already highlighted in peat bogs, lakes and ice cores records. But few studies deal with local contamination near mines or ancient urban centres. However, this approach is central to our understanding of the magnitude of ancient civilisations impact on their local environment. Moreover it could help archaeologists to characterize anthropic activities in absence of archaeological evidences.

Sidon (or Saïda currently located in the South Lebanon) was a Phoenician harbour located on the Levantine coast between Tyr and Beirut and was an important commercial and industrial center. Sidon struck several times gold and silver currency and is known in the Mediterranean basin for its metallurgy of bronze and iron despite no significant metals resources in Lebanon.

In this study, we measured lead concentrations and isotopic composition by thermal ionisation mass spectrometry in ancient sediments of Sidon´s harbour and compare the results with the history of the city, archaeological artefacts (bronze weapons) and the possible sources of metals in the Mediterranean basin.

Results show that, since 1694-1451 cal B.C., lead concentrations are four times higher than in unpolluted bottom sediments. Lead isotopic composition is also less radiogenic due to use of lead ores. During the Roman Period (since 183cal B.C.- 195cal A.D.), there is an elevation of lead concentration but no more isotopic variations. Isotopic composition of anthropogenic lead in the sediment compared to isotopic compositions of metal artefacts and possible ores show that lead used in Sidon during the Antiquity was coming from several sources: Spain (Carthagena and Rio Tinto mines), Sardinia and Cyprus, which are known to be Phoenician and then Roman colonies.

Lead record in ancient harbour sediment provides thus a way to better characterise local human activity and also the metals trade during the Antiquity.