

Stable isotope analysis on charred carpological material and its interpretation to discriminate agricultural practices and climate instability in Central Italy.

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Abstract

Stable carbon and nitrogen isotope ratios in plant tissues reflect the environmental conditions in which they developed. Since the first study by Marino & DeNiro [1], scholars demonstrated that this environmental information is preserved in archaeobotanical remains even after they were buried and/or carbonized [2][3]. When applied to cereal grains, this method allows to gain insights in past agricultural practices about which little is known. Indeed, until now, most of the evidence exists in indirect forms such as tools, texts, remains of past landscape management or products of this agriculture. Stable carbon isotope analysis permits to assess the crops' water availability [4], while manure status can be inferred thanks to the measurement of stable nitrogen isotope ratios [5].

This method has never been applied before on archaeobotanical remains in Central Italy for the Roman period. We are presenting here preliminary results coming from charred cereal grains of emmer (*T. dicoccum*) and barley (*H. vulgare*) from 3 archaeological sites Gabii, the Palatine Hill and Tarquinia. Together, they cover a range of time from the 10th to the 6th cent. BCE. The high-resolution stratigraphic excavation and chronology let us explore changes in sub-periods of about 50 years. When the chronological sequence is so detailed, the selection of the carpological remains for stable isotope analysis becomes very challenging. In absence of closed primary deposits, very common situation in many archaeological sites, the origin and the formation processes of the carpological assemblages need to be assessed. Indeed, they have to come from archaeological contexts where the material is more likely to originate from a short and synchronous period of time. This issue needs to be addressed in the planning and sampling for isotope analysis and it is of paramount importance to correctly assess the variability of the isotopic values and for the interpretation of the results in relation to changes in farming practices.

Riferimenti

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