

Anthracology in the Caves of Fuentes de León (Badajoz, Extremadura, Spain): notes for the characterization of the plant environment of the neolithic communities and Roman period of the SW of the Iberian Peninsula

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Summary: We present a preliminary study of archaeological wood charcoal macro-remains of some caves of the Natural Monument of Fuentes de León (Cueva de Los Postes and Sima de Caballos). The results are summarized in a particular anthracologic sequence that makes it possible provide new data on the palaeoecological and palaeoenvironmental evolution inside the SW of the Iberian Peninsula between 7500 and 2000 BP.

Key words: Anthracology, plant environment, Holocene, Neolithic, Copper Age, anthropic intervention.

INTRODUCTION

We report here preliminary anthracological results from two of the cavities that form the Fuentes de León Natural Caverns Monument (Badajoz, Extremadura, Spain) to add to anthracological and archaeobotanical record which, since the 1990s, has been systematically developed in our region and the surrounding areas. Although excavation work is still in progress, including the recovery of plant macro-remains, we present anthracological data obtained up to the 2007 campaign which encompass the funerary deposits from Cueva de Los Postes from between approximately 7500 and 4500 BP, and the Roman occupation of the Sima de Caballos in the first centuries of our Era.

The recovery of anthracological samples from these sites consisted of a mixed strategy of direct collection, both dry and wet sifting of the charcoal, and floating the sediment by stratigraphic unit and excavation grid. This protocol allowed us to recover a high number of scattered remnants of charcoal on which we have made an initial anatomical analysis of 3,117 fragments, of which the distribution by context and stratigraphic unit are summarized in the anthracological diagram of Figure 1.

DATA AND RESULTS

3117 charcoal fragments have offered a taxonomic listing of 24 determinations in addition to the "non-identifiable" group. The set of taxa are divided in two gymnosperms (*Pinus nigra-sylvestris* and *Juniperus* sp.), twenty-one dicotyledonous angiosperms (*Alnus glutinosa*, *Arbutus unedo*, Cistaceae, *Erica* sp./Cistaceae, *Erica* sp., *Fraxinus* sp., Labiatae, Leguminosae, *Olea europaea*, *Phillyrea/Rhamnus alaternus*, *Pistacia lentiscus*, *Pistacia terebinthus*, *Populus/Salix*, *Quercus ilex-coccifera*, *Quercus* sp., *Quercus* sp. t. evergreen, *Quercus* sp. t. deciduous, *Quercus suber*, Rosacea t. Maloidea, *Rubus fruticosus* and *Viburnum tinus*) and one monocot angiosperm (cf. Monocotyledon).

The measurements allow us to suggest the existence in the environment of the caves of a panorama of complex vegetation composed of conifers (which in the case of the pines had always been considered introduced in our region), a greater diversity of oaks, as well as riparian elements, in contrast to the types of vegetation found today in this environment such as mesophylls cork and oak (Devesa, 1995).

If we look at the results sequentially, anthracological data from Fuentes de León provide a glimpse into an evolving vegetation in which environmental and anthropogenic factors intervene in its historical development (Fig. 1).

Thus, the base units of the diagram (SU's 12 and 11), with an absolute dating of 7360 ± 50 BP, although dominated by sclerophyllous-evergreen vegetation highlighting the relative values of *Olea* and to a lesser extent, *Quercus ilex-coccifera*, are the only ones that show the presence of mountain pine character accompanied by *Juniperus* sp.

The absence of *Pinus nigra-sylvestris* and *Quercus* sp. t. deciduous and character point of *Juniperus* sp., together with the maintenance of the thermophilic vegetation in the EU's 10 to 8 are the arguments that allow the establishment of a new phase in the anthracological sequence between 7000 and 5445 ± 40 BP.

It would be from this time coinciding with the EU's 7 to 5, culturally linked to the Copper Age, when the vegetation shows signs of a drastic transformation related to human intervention on the environment. In this sense, the dramatic decline in *Olea* curve and less of other oaks such as *Quercus suber*, with the notable increase of bushes and shrubs such as *Arbutus*, *Pistacia*, Cistaceae and Leguminosae, among others, are symptomatic evidence of the significant transformation of the environment that occurred at that moment, perhaps as part of a consolidation period of the producing societies as we seem to detect during the

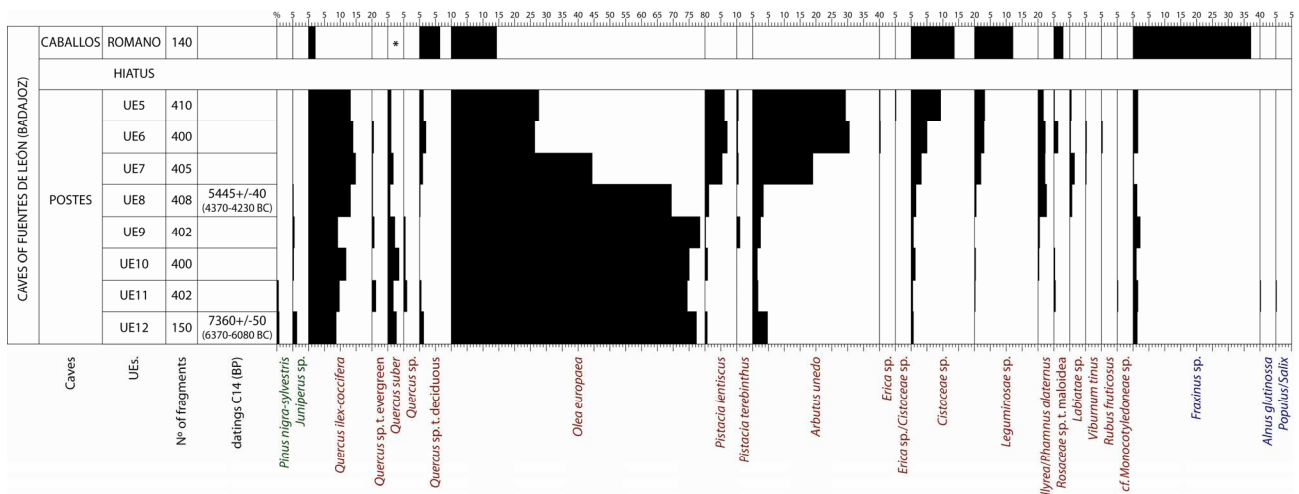


FIGURE 1. Anthracological diagram of Fuentes de León's caves (Badajoz, Extremadura, Spain).

Chalcolithic of the Guadiana Basin (Enríquez, 1990). This degree of human intervention could be extended to the Roman phase of Fuentes de León, although the recovery context of the anthracological samples and the low volume of the same force us to be cautious at the moment.

DISCUSSION

The sequence of vegetation offered by the anthracologic study of Fuentes de León allows, for the moment, to expand the documented view which in this area we have so little information in SW Spain. The establishment of sclerophyllous-evergreen vegetation of thermophile character does not appear to be unique thereof, insofar as some anthracological records in the Portuguese Tagus (Figueiral, 1998) and pollen from the peneplain of Cáceres show a similar profile to chronologies of Old and Middle Neolithic (López, 2006). However, the picture of the vegetation of the SW does not appear to be uniform. In these same periods, the vegetation spectra varied according to the biogeographic context which we analyzed from the interior (Duque, 2004; Carrión, 2005) or Portuguese coastal and sublittoral (Mateus and Queiroz, 1993).

Within this scenario, the presence of mountain pine (*Pinus nigra-sylvestris*) in Fuentes de León, although always timely documented, seem to repeat anthracological sequences like those of the river Sever (Duque, 2004) and palynological of the River Tajo (López, 2006) with chronologies between 8000 and 6000 BP.

In one sense, the most obvious signs of transformation of natural vegetation in the peninsular SW appear to begin around the periods documented at the caves of Fuentes de León with the process of reduction of forest elements and the extension of a

diverse series of bushes and shrubs, to which the strongest signal begins to be detected during the Copper Age of SW Spain.

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