

Charcoal analysis in the district of Loma (Jaén, Spain)

M^a Oliva Rodríguez-Ariza¹

¹ Centro Andaluz de Arqueología Ibérica, Universidad de Jaén, 23071 Jaén, Spain; moliva@ujaen.es

Summary: A study has been made of the charcoal from two archaeological sites located in the district of Loma (Jaén, Spain) and dating from the second half of the 4th to the first quarter of the 2nd millennium BC. The results indicate the presence of a thermophilous oak forest with elements that indicate a wet environment during the 4th and 3rd millennium and an aridification of the climate together with a loss of tree cover from the beginning of the 2nd millennium onwards.

Key words: charcoal analysis, Late Neolithic, end of the Copper Age, Bronze Age, Andalusia.

SETTING AND BIOGEOGRAPHY

The sites studied are situated in the district of La Loma, in the province of Jaén (Spain), within the Guadalquivir River Depression, which occupies a large part of Andalusia. This district has slightly elevated relief over the Guadalquivir Valley, equidistant between the mountain systems of the Sierra Morena to the north, Sierra Mágina to the south and the Sierras of Cazorla-Segura to the east, with the west remaining open to oceanic influence. The zone is situated in the lower mesomediterranean bioclimatic level, and biogeographically it belongs to the Hispalense sector, of the Betic province. The dominant vegetation series is that of *Quercus rotundifolia* (Rivas Martínez, 1987; Valle, 2004). Currently, the area is occupied by olive cultivation, with natural vegetation identifiable only at isolated points inaccessible to grazing and ploughing. The supramediterranean and oromediterranean levels are found in the mountain massifs of Sierra Mágina and Sierras of Cazorla-Segura (Fig. 1).

METHODOLOGY AND SITES

The charcoal from two sites was studied: Las Eras del Alcázar of Úbeda and El Cerro del Alcázar of Baeza. The charcoal comes both from collection at different points as well as from the manual flotation of sediments.

For the diagram constructed and the conclusions drawn, the charcoal was grouped according to the chronological-cultural sequence defined for each site. In the Eras del Alcázar of Úbeda, three time periods were defined: the first was ca. 3500-2500 BC, between the Late Neolithic to the Middle Copper Age, defined urbanistically by circular dwellings excavated in the soil with rammed-earth walls of adobe and plant material; the second was ca. 2200-2000 BC, defined as the Late Copper Age, with beaker pottery and free-standing dwellings on the ground; finally, the third period was ca. 2000-1700 BC and belongs to the Bronze Age, the urban pattern changing to rectangular dwellings (Lizcano *et al.*, 2009).

In the Cerro del Alcázar of Baeza, the charcoal was

analysed from a Bronze Age settlement, where a succession of 4 major phases of occupation were determined from ca. 1900 to 1500 BC (Pérez and Lizcano, 2003), coinciding in part with the last phase of the previous settlement. All four phases present similar characteristics in terms of the construction system of the rooms, with rectangular dwellings and the materials used for the floors occupied.

RESULTS AND DISCUSSION

The results of the charcoal analysis indicate the predominance of *Quercus ilex-coccifera* vegetation, with percentages of 40 to 80%. It bears noting that at the levels where *Quercus ilex-coccifera* diminishes, *Pinus halepensis* increases, although the percentages are far lower (Fig. 2). This somewhat erratic trend of the percentages reflects the opening of the vegetation in the Copper Age for the creation of open fields of cultivation, favouring the presence of *Pinus halepensis*; meanwhile, in the Bronze Age, different species are used in definite construction phases of the dwellings.

Therefore, we made an overall evaluation of the two anthracological phases defined, corresponding to the two major chronological periods: Neolithic Final-Copper Age (ca. 3500-2000 BC) and the Bronze Age (ca. 2000-1500 BC).

Qualitatively, it should be highlighted that in the beginning, there was a greater number of taxa identified (18) than in the Bronze Age (diminishing to 13), indicating the beginning of a loss of floristic diversity. Notable among the taxa that disappeared are deciduous *Quercus* and *Quercus faginea*, which indicate lower moisture, while the disappearance of *Phillyrea* and the decline of *Pistacia lentiscus* would indicate a slightly colder environment. In counterpoint during the Bronze Age, appeared *Retama* while *Rosmarinus officinalis* slightly increased. All this implies a trend towards aridification during the Bronze Age that would correspond to the general pattern defined for the western Mediterranean from the Middle Holocene onwards (Carrión *et al.*, 2010).

