Vegetation, firewood exploitation and human settlement in northern Spain in relation to Holocene climate and cultural dynamics

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ABSTRACT

Charcoal data from archaeological sites located in the Cantabrian region (N Spain) presented aims to reconstruct the interactions between climate dynamics, vegetal landscape and woodland exploitation developed by humans throughout the different Holocene cultural stages. The transition to the Holocene was a period of important changes. The increase in temperature and moisture implied the expansion of deciduous Quercus over the previous pioneer taxa Pinus and/or Betula, coinciding with the Azilian-Mesolithic cultural transition in the Cantabrian region. The development of deciduous oak woods recorded during the Holocene climatic optimum was reported as the main vegetation formation exploited by Cantabrian Mesolithic and Neolithic groups. The different geographical locations of the sites (shoreline, pre-littoral elevations/inner Atlantic valleys and uppermost intra-mountain valleys) as well as their topographic features, substrate, slope orientation and altitude explain the floristic variations observed in the anthracological assemblage. The Chalcolithic, Bronze and Iron Ages were characterised by an intensification of the exploitation of the same plant ecosystems especially those of shrubby plants. Their dominance over arboreal taxa indicates the increasing human pressure on the vegetal communities which may have been mainly related to itinerant livestock herding practices in the area.

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1. Introduction

The Holocene is defined by periods of climatic instability that involve changes affecting the geographical features of territories and the subsequent distribution of animal and plant communities, resulting in a decisive influence on prehistoric groups particularly regarding their technological and cultural stages. This vegetation-climate-human interaction approach is the focus of most recent palaeo-botanical (off-site) and archaeo-botanical (on-site) contributions covering several areas of Eurasia (e.g. Chlachula and Catto, 2010; Hoek et al., 2015; Velichko et al., 2009; see references therein) and the Mediterranean basin (e.g. González Sampere et al., 2009; Mercuri et al., 2011; Cortes et al., 2012; Uzquiano et al., 2016; Zanchetta et al., 2013).

As regards to the Cantabrian region here discussed, during the transition to the Holocene as well as its earlier phases the sea level rise resulted in changes in the morphology of the littoral area and the subsequent loss of exploitation territories for the last Azilian and early Mesolithic groups, who needed to adopt diverse adaptation strategies to this new scenario (Straus, 1992; González Morales, 1990a; 1990b). The interaction of climate variability, Quaternary geology, vegetation dynamics and Archaeology has a long tradition in this area resulting in various multidisciplinary works since the last decades of the 20th century (e.g. Mary et al., 1975; Cearreta and Ugarte, 1990; Cearreta et al., 2010, 2015; Straus, 1992, 2008; Ontanón et al., 2013). The first charcoal synthesis for the area was actually developed in this framework (Uzquiano, 1992). So far, anthracological investigations in N Spain over the past 23 years has resulted in a large number of new charcoal data leading to the drawing of new synthetic works such as the recent paper on vegetation, climate and human interactions in Late Upper Palaeolithic settlements during the Marine Isotope Stage 2 (MIS 2) (Uzquiano, 2014). In this way, the present study should be regarded as a continuation of such research, being chronologically placed within the Marine Isotope Stage 1 (MIS 1), and following the same dual and closely-related purpose -namely, the interaction between natural and human factors as far as Anthracology is concerned (e.g. Vernet, 1997; Uzquiano, 1997; Théry et al., 2010).

Although Anthracology has proved a useful tool to picture past wood vegetation, the interpretation of charcoal data (Fig. 1a, b,
(Carrión-Marco, 2005; Euba et al., 2015; Ruiz-Alonso et al., 2011; Zapata, 2012) as much as some carpological and archaeozoological evidence available for the area (Altuna, 1990; Arias, 2007; Bailey, 1983; Gutiérrez Zugasti, 2009; López-Dóriga, 2013; Ontañón et al., 2013; Peña et al., 2005; Uzquiano and Zapata, 2000; Zapata, 2000) was also integrated in the discussion.

2. Geographical setting of sites

The Cantabrian region comprises the territories located between the Cantabrian Sea and the watershed of the homonymous mountain range, covering a land strip about 20–40 km wide (Cendrero et al., 1986). The area discussed here includes the Basque-Cantabrian shoreline (Basque Country, Cantabria and Asturias) and several inland areas located in the lower Atlantic valleys and the Prelittoral Depression (Asturias) (Fig. 1a) until the uppermost Cantabrian intra-mountain basins (El Espertín site, NE León) (Fig. 1b).

The geographical distribution of main the mountains and valleys together with the density of the hydrological system generate a clear sectoring of the territory into diverse natural regions, from the littoral areas to the uppermost intra-mountain basins. Both slope orientation and the nature of dominant substrate are responsible for the current floristic diversity, characterised by several plant communities with different ecological needs but growing nearby. The E-W arrangement of the mountains also generates different sheltered situations (Bertrand, 1974), especially on the E Asturias-
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