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A chrono-cultural reassessment of the levels VI–XIV from El Cuco rock-shelter: A new sequence for the Late Middle Paleolithic in the Cantabrian region (northern Iberia)

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ABSTRACT

A large number of sites dated to the Late Middle Paleolithic and the Early Upper Paleolithic have been recorded in the Cantabrian region (northern Iberia), making this area a key location to investigate the lifeways of the last Neanderthals and the first anatomically modern humans. The stratigraphic sequence from El Cuco rock-shelter was originally attributed to the Early Upper Paleolithic based on radiocarbon dates measured on bone apatite. However, new radiocarbon dates on shell carbonates from the lower levels produced inconsistent dates with those previously published. In order to clarify this anomaly, a reassessment of the chronology of levels VI to XIV was undertaken. The review was based on new radiocarbon dates performed on bones and shells, and a re-evaluation of the lithic assemblages. Bone samples did not produce radiocarbon dates due to a lack of collagen preservation but radiocarbon dating of shell carbonates provided dates ranging from 42.3 to 46.4 ka BP. These dates are significantly older than that previously obtained for level XIII using biogenic apatite from bones (~30 ka uncal BP), suggesting that the bone apatite used for radiocarbon dating was rejuvenated due to contamination with secondary carbonate. Lithic assemblages, defined in the first place as Evolved Aurignacian, have now been confidently attributed to the Mousterian techno-complex. These results suggest a Middle Paleolithic chronology for this part of the sequence. The new chronology proposed for El Cuco rock-shelter has significant implications for the interpretation of Neanderthal subsistence strategies and settlement patterns, especially for coastal settlement and use of marine resources, not only in northern Iberia, but also in Atlantic Europe.

1. Introduction

The Cantabrian Region (northern Iberia) is a key location to investigate important questions about human evolution, such as the behavioral variability and demise of Neanderthal populations, the expansion of Modern Humans towards Western Europe, and the origins of symbolic behavior, among others. This region contains good examples of Late Mousterian cave sites, including El Esquilleu, El Sidrón, Sopeña, El Castillo, Cueva Morín, Covalejos or Axlor, to name but a few (Sanguino González and Montes Barquín, 2005; González Urquijo et al., 2005; Maíllo Fernández, 2007; Sánchez-Fernández and Bernaldo de Quirós, 2008;Santamaría et al., 2010; Baena et al., 2012; Pinto-Llona et al., 2012; Rios-Garaizar, 2012, 2016; Wood et al., 2013a, b), several cave and open air Châtelperronian sites, as Cueva Morín, Aranbaltza and

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Labeko Koba (Arrizabalaga, 2000; Maíllo-Fernández et al., 2004; Rios-Garaizar et al., 2012a; b), and some Proto/Early Aurignacian cave sites, as La Viña, Cueva Morín, El Castillo and Labeko Koba, among others (Arrizabalaga, 2000; Maíllo-Fernández, 2002; Maíllo-Fernández and Bernaldo de Quirós, 2010; Santamaría Álvarez, 2012; Wood et al., 2014). A number of investigations on the Late Middle Paleolithic and the Early Upper Paleolithic have recently been undertaken in the region, significantly increasing the knowledge of the different techno-complexes and their characteristics. Studies on chronology (e.g. Maroto et al., 2012; Higham et al., 2014; Wood et al., 2014), environmental conditions (e.g. Iriarte et al., 2005; López-García et al., 2011; García-Ibaibarriaga et al., 2015; Rofes et al., 2015), bioanthropology (e.g. Bermúdez de Castro and Sáenz de Buruaga, 1997; Torres et al., 2010; Rostro Carmona, 2013; Rosas González et al., 2015), technology (e.g. Carrión Santafé et al., 2008; Rios-Garaizar, 2008) and subsistence practices (e.g. Altuna and Mariezkurrena, 2000; Castaños, 2005; Yravedra, 2013; Rios-Garaizar and García-Moreno, 2015) have provided crucial data to establish a better framework for the interpretation of the important biological and cultural changes that occurred in this period.

One of the most significant sites for the study of this period is El Cuco rock-shelter. The site is located in the eastern part of the Cantabrian region and it was excavated in 2005 by an archaeological team led by one of us (PR). In 2007 a monograph including studies of different materials, such as lithics, pollen and macrofaunal remains, was published (Muñoz Fernández et al., 2007). Two test pits were excavated at the site. One test pit was located at the entrance of a small cave, called "Covacha" (Sector A). Here, a 1 m^2 test pit was dug revealing a 2.2 m sequence composed of 13 levels that were assigned to the Holocene and to the Gravettian (levels D-M). Another test pit was carried out in the eastern part of the rock-shelter (Sector B). Excavation in this area revealed a 2.5 m deep stratigraphic sequence that comprised 14 archaeological levels (I-XIV). Two radiocarbon dates were obtained from the apatite fraction of macromammal charred bones from levels XIII and III, as poor bone collagen preservation prevented dating of this material. The results obtained for the sample dated from level XIII was 30,020 + 160–150 uncal BP (GrA-32436), leading the authors (who were at that time unaware of the fact that bone apatite was used for radiocarbon dating) to attribute the lower part of the sequence (levels VI to XIV) to the Evolved Aurignacian, while the result obtained from level III was 23,400 ± 210 uncal BP (GrA-32097), suggesting a Gravettian cultural attribution for the upper levels (V–III) of the sequence (Muñoz Fernández et al., 2007; Maroto et al., 2012).

Recently, in the framework of a project developed by one of the authors (IGZ) to assess the environmental conditions prevailing during the Upper Paleolithic (UP) in northern Iberia, additional radiocarbon dates were undertaken using limpet shells from level X. The results obtained contradicted the cultural attribution of this level to the Aurignacian and placed the occupation in an earlier period. Also, considering the regional record, the characteristics of the published lithic assemblages were found to be quite anomalous when compared to assemblages from other Early Upper Paleolithic (EUP) levels in the region. This was noted in a recent synthesis about the Gravettian and Evolved Aurignacian in the Cantabrian region (de la Peña, 2011; Rios-Garaizar et al., 2013a,b).

In order to clarify these anomalies, and given that radiocarbon dates taken from biogenic apatite should be considered cautiously (Taylor, 1987; Zazzo and Saliège, 2011), a reassessment of the chronology of the entire sequence at El Cuco was undertaken. In this paper we present data obtained from the reassessment of Sector B at the site. This review was based on new radiocarbon dates performed on bones and shells, and a re-evaluation of the lithic assemblages. Up to now only results for the oldest levels (VI to XIV), supposedly corresponding to the Evolved Aurignacian, are available. Results will be used to discuss the chronology originally proposed for the site and to provide a new framework for the study of human populations occupying the Cantabrian region during the Late Middle Paleolithic (LMP) and the Early Upper Palaeolithic.

2. El Cuco rock-shelter: description and archaeological evidence

2.1. The site

El Cuco rock-shelter is located in the town of Castro-Urdiales, in the Autonomous Community of Cantabria (Cantabrian region, northern Iberia) (Fig. 1). The rock-shelter presents an arc-shaped plant and measures 34 m long and 5 m deep. A test pit covering a surface of 2 m^2 was excavated in Sector B, situated on the eastern side of the rock-shelter (Fig. 2). Excavation revealed a 2.5 m deep sequence composed of 14 levels (I-XIV). Bedrock was not found at the base of the excavation, suggesting the existence of additional stratigraphy below level XIV. Levels I and II were found to be reworked, and contained mixed materials of different chronologies, some of them modern in appearance. The rest of the sequence was well preserved with clear sedimentological differences that allowed the identification of different stratigraphic units (Muñoz Fernández et al., 2007). In this paper we will only refer to the lower part of the stratigraphy, from levels VI to XIV (Fig. 3). The sequence revealed a succession of sedimentary episodes, including roof fall events and stalagmite crust formations. Levels VI and VIII consisted of soft and loose crusts whilst levels IX and XI were formed by hard and compact crusts. All of these levels presented very limited amounts of archaeological material. The other stratigraphic levels, in which artifacts and other archaeological items were found abundantly, were defined as follows: level VII was characterized by brown silty sediment, slightly damp, with some limestone blocks arranged horizontally; level X was composed of very loose brown silt with abundant limestone blocks of small and medium size, and some isolated blocks of calcite crust; level XII consisted of loose and damp yellow silt with limestone inclusions; level XIII was formed by brown silty clay, slightly damp, with some small limestone blocks; and level XIV was dark brown clay (this level was excavated in a very limited extension so it was difficult to properly define its features).

2.2. Faunal assemblages

The macrofaunal assemblage (Castaños and Castaños, 2007) is quite rich but very fragmented, probably due to a mixture of human activity and postdepositional processes, although a full taphonomic study has not been performed so far at the site. Given the poor state of preservation, species identification turned out to be challenging and only 161 remains out of the 6702 recovered in levels VI to XIV were possible to identify. The presence of carnivores is evident in levels XII and XIII, but their frequency and importance in the taphocenosis are very limited. The most represented species in the entire sequence is the red deer (*Cervus elaphus*), which is also the dominant species in the bone assemblages from all levels, followed by the tribe Bovini (only one specimen was identified as *Bison priscus*). Other species such as horse (*Equus ferus*) (levels VII, XIII), ibex (*Capra pyrenaica*) (X, XI), chamois (*Rupicapra pyrenaica*) (XII, XIII), roe deer (*Capreolus capreolus*) (VII, XII) and woolly rhinoceros (*Coelodonta antiquitatis*) (X, XIII) appear in low numbers. Recently, Proboscidea teeth fragments were found in level XII by one of us (ABMA). Given the state of preservation of the fragments it was not possible to identify the dental elements. However, it was possible to determine that the fragments belonged to the genus *Mammuthus*.

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