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The vegetational and climatic contexts of the Lower Magdalenian human burial in El Mirón Cave (Cantabria, Spain): implications related to human behavior

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ABSTRACT

This paper presents and discusses the results of the studies of pollen and micro-mammal remains associated with the human burial in El Mirón Cave, dated in the Lower Magdalenian. The sedimentological integrity of the deposit has been confirmed through its comparison with the penecontemporaneous level in other parts of the cave. From the environmental point of view, this unit, like others of the same age in northern Spain, attests a very cold and arid climate. However, the pollen study reveals that it can be differentiated by the large quantity of Chenopodiaceae pollen (occasionally in the form of aggregates of grains), exclusively in the funerary context. In the discussion, various hypotheses are considered (funerary offering, food, to hygienize the grave or medicinal use) to interpret this overrepresentation. Although all the possibilities remain open, the most likely is thought to be the direct deposit of flowers at the time of the burial, either as a ritual element or for a more practical and hygienic purpose.

1. Introduction

The very large, open, west-facing vestibule of El Mirón Cave contains a long late Upper Pleistocene and Holocene deposit that has been excavated since 1996 by L.G. Straus and M.R. González Morales. The site is strategically located in a foothill chain of the Cantabrian Cordillera, at 260 m above present sea level, and 150 m above the valley floor at the confluence of the Calera and Gándara rivers with the Asón, in the town of Ramales. It is 20 km from the present shore of the Bay of Biscay. The cave is surrounded by crests and peaks at or above 1000 m a.s.l. (Fig. 1). In 2001, 2010–11 and 2013, remains from one human individual were found between a large, engraved block and the SE corner of the vestibule rear, in an archeological layer pertaining to the Cantabrian Lower Magdalenian (Straus et al., 2011a).

The information which we present here forms part of the wider palynological and micromammalian studies of the sedimentary deposit in this site. Given the dimensions of the cave and its long cultural sequence (e.g., González Morales and Straus, 2005, 2012; Straus and González Morales, 2003, 2007, 2009, 2010, 2012; Straus et al., 2008), Iriarte-Chiapusso designed a palynological sampling strategy adapted to the characteristics of the deposit that has been carried out during the course of successive excavation campaigns in order to obtain adequate representations of the complete series of levels, from the late Middle Paleolithic through the early Bronze Age. Vertical sampling columns in the various excavation areas at the vestibule front, middle and rear were supplemented by occasional horizontally collected samples designed to best understand the vegetation at specific periods of time that were being revealed archeologically. To date, the Holocene palynological record has been published (Iriarte-Chiapusso, 2012; Straus and González Morales, 2012) and we are now focused on the archeobotanical study and paleoenvironmental reconstruction of the Upper Pleistocene levels. We have already preliminarily published some results pertaining to the Gravettian and Solutrean levels (Iriarte-Chiapusso and Murelaga, 2012; Straus et al., 2011b, 2012). Unfortunately, many—but not all—samples from the site have proven to be poor or devoid of pollen. Cuenca-Bescós' methodology for the systematic study of rodent and other small

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Fig. 1. Location of El Mirón Cave in eastern Cantabria Province.

mammal remains from flotation samples taken throughout El Mirón Cave are described in Cuenca-Bescós et al. (2008, 2009).

In all phases of this palynological research, we have used the same analytical methodology (sampling, physical-chemical treatment of the sediment, identification and counting of pollen and spores, and interpretation of the results). The reader is directed to the description of our methods in the El Mirón Holocene monograph (Iriarte-Chiapusso, 2012).

2. Palynological study of the burial and its immediate surroundings

The palynological study of the burial context of the so-called Red Lady of El Mirón was conducted in two contiguous stratigraphic sections (Fig. 2). First, we analyzed a sedimentary column taken in the western section (X-W/6) of the burial area, which from bottom to top included levels 505 (Lower Cantabrian Magdalenian), 504 (the burial layer) and 503.1 (late Lower Magdalenian). Given the very poor preservation of pollen in this column (Table 1) -perhaps due to the proximity of this section to the cave wall-we proceeded to analyze aliquots of two samples of sediment, that had been taken from the Y7-6 section by R. Seva (Universidad de Alicante) for analysis of ochre found in intimate association with the human remains. The uppermost of these samples (Level 503) probably pertains to the Middle Magdalenian, as it overlies 503.1, that is dated on juniper charcoal to 15,120 ± 40 BP, and underlies disturbed Level 502, that yielded a Magdalenian harpoon barb, while the lower sample (Level 504) is from the burial fill itself. The results we obtained from the two samples are quite different. While the pollen grains recovered from the Level 503 sample are too few to be statistically valid (Table 2), the Level 504 sample yielded more than 300 specimens, with notable taxonomic diversity.

Level 504 is dated on a mammal bone to 15,740 ± 40 BP and on a human bone to 15,460 ± 40 BP. Its pollen spectrum is indicative of an open landscape (arboreal pollen [AP] = 9.6%, with a slight presence of fern spores (2.7%) (Fig. 3)). The reduced woodland component is made up almost entirely of pine (*Pinus sylvestris* tp.), while the herbaceous-shrub component is dominated by a remarkably high percentage of Chenopodiaceae (49.5%), which we discuss below. There are very small percentages of grasses (Poaceae = 11%), composites (*Compositae liguliflora* = 7.5% and *Compositae tubuliflora*) and heathers (Ericaceae=4%), accompanied by trace quantities (<2%) of Labiatae, *Plantago*, Rosaceae, *Artemisia*, *Asperula* tp., Umbelliferae and Cyperaceae. This taxonomic composition reveals an environment that was cold and not humid.

In order to contextualize these isolated results from the burial area, the primary referent is the palynological column from the western (H-G/2) section in the El Mirón vestibule front ("Cabin") excavation area (Fig. 2), where we have a continuous series of samples from a layer (Level 17), that is penecontemporaneous with Level 504—Lower Cantabrian Magdalenian, dated to 15,700 ± 240, 15,610 ± 90, 15,470 ± 240, 15,450 ± 160 and 15,370 ± 80 BP (Straus and González Morales, 2010). We emphasize this chronological proximity between both contexts to justify the consistency of the comparison between their pollen spectra. Only the highest of these four samples (no. 4) lacks a sufficient number of pollen grains to be considered statistically valid (Fig. 4; Table 3). In the record of the three other Level 17 samples, we observe stadial environmental conditions, although there are hints of a slight climatic amelioration in the most recent of the samples (no. 3). The lower two samples have the lowest percentages of arboreal pollen, with the second lower of them (no. 2, middle of Level 17) having the most markedly stadial character (small amounts of juniper accompanied by pine and birch and evidence of aridity). In both of these samples, the dominant herbaceous-shrub stratum is composed fundamentally of *Compositae liguliflora* (35 and 47%) and Poaceae (27 and 22%), while *C. tubuliflora*, Ericaceae, Fabaceae and Cyperaceae all have percentages under 10%. In turn, *Cistus*, *Centaurea*, Lamiaceae, *Plantago*, Brassicaceae, Ranunculaceae and Umbelliferae appear only sporadically in trace quantities.

The palynological spectrum of Level 504 from the Red Lady burial coincides with an intensely cold stadial period, just as do the lower two spectra from Level 17, 17 m to the west, toward the cave mouth. However, we do detect a vegetational matrix indicative of relatively lower humidity in the Level 504 sample, with a lower representation of fern spores, the presence of cryo-xeric taxa such as *Artemisia* (4%), lesser relative frequencies of heathers and grasses, etc. Nonetheless, the most significant difference between penecontemporaneous Levels 17 and 504 is the overwhelming domination of the burial sample by Chenopodiaceae—a family which is totally absent in the Level 17 samples (column H-G/2).

3. Small mammals from the burial area

Levels 504, 505 and 506 yielded relatively poor assemblages of microvertebrates, in terms of both numbers of species and total numbers of remains. However, a few interesting paleoenvironmental observations can be made from their analysis (Table 4).