Quaternary International xxx (2016) 1–8

Contents lists available at ScienceDirect

Quaternary International

journal homepage: www.elsevier.com/locate/quaint

El Mirador cave (Sierra de Atapuerca, Burgos, Spain): A whole perspective

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ARTICLE INFO

Article history:
Available online xxx

Keywords:
Livestock
Pastoralism
Fumier
Neolithic
Bronze Age
Iberian Peninsula

ABSTRACT

The archaeological site of El Mirador is located in the southern slope of the Sierra de Atapuerca. The work developed at the site is providing a substantial set of data from the Upper Palaeolithic and Early Neolithic to the Middle Bronze Age. Throughout at least about 4000 years of occupation, the cave was used for various activities, among which, burial, habitation and animal stalling. The practices related with this last use is, at the moment, the main origin of the archaeological deposits, which are mainly composed by burnt animal dung with vegetal residues, potsherds, lithics and faunal remains. In addition, it is characterized by high sedimentation rates that have enabled an individual and clear record of different episodes, providing high resolution chronological data. Due to these particularities, specific excavation methodology and interdisciplinary studies of the archaeological data have been developed in order to understand the genesis of this archaeological sequence and, at the same time, to provide information about the introduction and development of the production economy in the Submeseta Norte region.

1. El Mirador cave

The El Mirador cave (Ibeas de Juarros, Burgos) overlooks the southernmost flank of Sierra de Atapuerca at an altitude of 1.033 m asl, with commanding southerly views across the Arlanzón River valley (Fig. 1). Presently, the mouth of this karst cavity is approximately 23 m wide and 4 high, penetrating some 15 m inwards. Its current shelter-like form is due to the collapse of part of the roof. It is part of the Sierra de Atapuerca karst system, although a possible connection to the Cueva Mayor cavitiy system along the Trinchera del Ferrocarril is yet to be confirmed.

Edelweiss Caving Group dug a small test pit in 1970 (Ortega and Martín, 2012) locating Bronze Age remains. This work was not continued, and poachers looted the site in the following years. In 1999, the Atapuerca Research Team began the archaeological excavation at the site and it is still continuing.

2. Archaeological fieldwork and stratigraphic succession

In the first 10 years, the archaeological work was focused in the excavation of 6 m^2 area test pit in the centre of the zone now sheltered by the roof, in order to ascertain the archaeological potential. In the 20 m deep profile explored during these years are documented 14 m of Pleistocene deposits and 6 m of Holocene sediment. In 2009, fieldwork began in two new sectors, named 100 and 200, at the NW and NE ends of the cave, respectively, in contact with the current wall. These sectors are not being dug vertically but

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http://dx.doi.org/10.1016/j.quaint.2016.01.044
1040-6182/

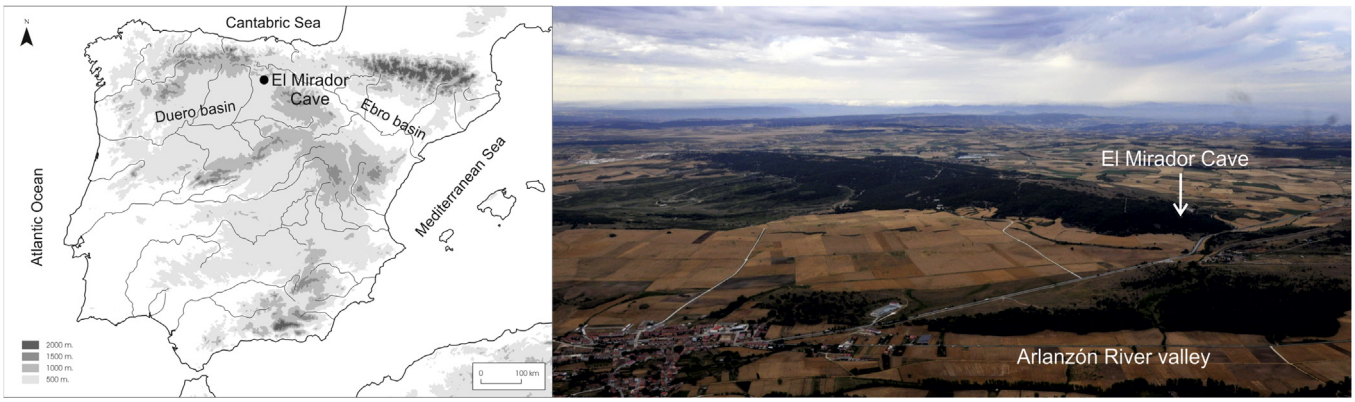

Fig. 1. Location of El Mirador cave.

in steps, following the line of the cave roof in order to document the inward retreat of the cave and also the stratigraphic variations between its different areas (Fig. 2, left).

The Pleistocene deposit is composed by 14 m of metric and decimetric limestone blocks with no sedimentary matrix in between. It is the result of the collapsed roof (MIR51/4 and MIR51/1) and contains two intercalated levels: MIR51/3, a shallow archaeological sterile level composed of wind-borne sediment, dated on 12.520 ± 40 BP (15.110–14.470 cal. BP) and MIR51/2, with the same sedimentary characteristics but with evidence of human activity: remains of a hearth, lithic and faunal materials. Charcoal samples extracted from material burned in the hearth have yielded two dates: 11.450 40 BP (13.420–13.180 cal. BP) and 11.670 40 BP (13.580–13.420 cal. BP).

The 6 m Holocene sedimentary layers rest directly on top of MIR51/. Four meters are attributed to Neolithic occupations (levels MIR24 to MIR6) occurring between the last third of the 6th millennium and the first half of the 4th cal BC (Vergès et al., 2008), while the remaining 2 m are from the Middle Bronze Age (MIR4 and MIR3A), between the 2nd and 4th quarter of the 2nd millennium cal BC (Vergès et al., 2002) (Table 1).

Table 1
1. Archaeological level; 2. Material; 3. Identification; 4. Laboratory number; 5 y 6. Measured Radiocarbon Age (5) and conventional (6), in years ^{14}C BP; 7 and 8. 2σ calibrated results, in cal BP years (7) and in cal BC years (8); 9. $^{13}C/^{12}C$ ratio. Calibrated using Intcal'13 curve (Reimer et al, 2013) in CalPal 2013.

1	2	3	4	5	6	7	8	9
MIR 4 (roof)	Charcoal	*Quercus* sp. evergreen	Beta-154894	3020 ± 40	3040 ± 40	1440–1120	3390–3070	−23.9‰
MIR 4 (base)	Charcoal	*Quercus* sp. deciduous	Beta-153366	3380 ± 40	3400 ± 40	1780–1580	3730–3530	−23.8‰
MIR 4 (pit)	Human bone	*Homo sapiens*	Beta-153366	3580 ± 40	3670 ± 40	2060–1820	4010–3770	−19.3‰
MIR 4 (pit)	Human bone	*Homo sapiens*	Beta-182041	3800 ± 40	3900 ± 40	2380–2100	4330–4050	−19.2‰
MIR 4 (pit)	Human bone	*Homo sapiens*	Beta-182042	3730 ± 40	3830 ± 40	2270–1990	4220–3940	−18.8‰
MIR 6	Charcoal	*Quercus* sp. evergreen	Beta-153367	4760 ± 40	4780 ± 40	3680–3400	5630–5350	−23.5‰
MIR 8	Charcoal	*Quercus* sp. evergreen	Beta-181086	4950 ± 40	4970 ± 40	3820–3620	5770–5570	−23.6‰
MIR 9	Charcoal	*Triticum aestivum/durum*	Beta-220912	5050 ± 40	5090 ± 40	3990–3710	5940–5660	−22.6‰
MIR 11	Charcoal	*Quercus* sp. evergreen	Beta-181087	5340 ± 50	5360 ± 50	4350–3990	6300–5940	−23.9‰
MIR 13	Charcoal	*Triticum dicoccum*	Beta-208131	5420 ± 40	5470 ± 40	4360–4200	6310–6150	−21.8‰
MIR 14	Charcoal	*Triticum aestivum/durum*	Beta-220913	5470 ± 40	5480 ± 40	4390–4230	6340–6180	−24.3‰
MIR 16	Charcoal	*Quercus* sp.	Beta-181088	5700 ± 70	5700 ± 70	4730–4370	6680–6320	−25.0‰
MIR 18	Charcoal	*Triticum dicoccum*	Beta-208132	6090 ± 40	6120 ± 40	5130–4890	7080–6840	−23.0‰
MIR 19	Charcoal	*Quercus* sp. deciduous	Beta-182040	6130 ± 50	6130 ± 50	5260–4900	7210–6850	−24.7‰
MIR 20	Charcoal	*Triticum dicoccum*	Beta-197384	6070 ± 50	6100 ± 50	5120–4840	7070–6790	−22.9‰
MIR 21	Charcoal	*Quercus* sp.	Beta-197385	6350 ± 40	6380 ± 40	5440–5240	7390–7190	−22.9‰
MIR 22	Charcoal	*Triticum aestivum/durum*	Beta-208133	6110 ± 40	6150 ± 40	5250–4890	7200–6840	−22.3‰
MIR 23	Charcoal	*Triticum dicoccum*	Beta-208134	6300 ± 50	6320 ± 50	5380–5180	7330–7130	−23.8‰
MIR 24	Charcoal	*Triticum dicoccum*	Beta-220914	6080 ± 40	6110 ± 40	5110–4870	7060–6820	−23.4‰
	Charcoal	*Pinus* type *sylvestris*	Beta-197386	7030 ± 40	7060 ± 40	6020–5820	7970–7770	−22.9‰
MIR 51/2	Charcoal	*Pinus* type *sylvestris*	Beta-208135	11450 ± 40	11470 ± 40	11470–11230	13420–13180	−24.0‰
	Charcoal	*Pinus* type *sylvestris*	Beta-208136	11670 ± 40	11610 ± 40	11630–11470	13580–13420	−25.0‰
MIR51/3	Pollen		Beta-220915	12520 ± 40	12480 ± 40	13160–12520	15110–14470	−27.2‰
MIR103	Charcoal	*Pinus* type *sylvestris*	Beta-339094	3150 ± 30	3190 ± 30	1500–1340	3450–3290	−22.8‰
MIR104	Charcoal	*Pinus* type *sylvestris*	Beta-339095	3330 ± 30	3350 ± 30	1710–1510	3660–3460	−22.4‰
MIR 106	Human bone	*Homo sapiens*	Beta-296226	3340 ± 30	3430 ± 30	1720–1520	3670–3470	−19.4‰
MIR203	Human bone	*Homo sapiens*	Beta-296225	4000 ± 30	4100 ± 30	2600–2440	4550–4390	−18.9‰
	Human bone	*Homo sapiens*	Beta-296227	4120 ± 30	4220 ± 30	2930–2530	4880–4480	−18.7‰

These levels were essentially formed as a result of the use of the cave as a livestock pen. The activities related to animal husbandry left sedimentary layers, dung, which was piled together and burned at regular intervals in order to reduce the volume and to eliminate parasites (Angelucci et al., 2009). These burned layers alternate with partially burnt and unburned layers of manure and nodules of ash from burned dung. An artefact record related to domestic

Please cite this article in press as: Vergès, J.M., et al., El Mirador cave (Sierra de Atapuerca, Burgos, Spain): A whole perspective, Quaternary International (2016), http://dx.doi.org/10.1016/j.quaint.2016.01.044