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PLEISTOCENE AND HOLOCENE
HUNTER-GATHERERS IN IBERIA AND
THE GIBRALTAR STRAIT:
THE CURRENT ARCHAEOLOGICAL RECORD



UNIVERSIDAD
DE BURGOS



BURGOS, 2014

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Published thanks to Junta de Castilla y León through Fundación Siglo para las Artes y el Turismo de Castilla y León.



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Publisher: UNIVERSIDAD DE BURGOS
SERVICIO DE PUBLICACIONES E IMAGEN INSTITUCIONAL
Edificio de Administración y Servicios
C/ Don Juan de Austria, nº 1
09001 BURGOS – SPAIN

FUNDACIÓN ATAPUERCA
Carretera de Logroño, nº 44
09198 Ibeas de Juarros (Burgos).

ISBN: 978-84-92681-87-7 (Printed Edition)
978-84-92681-88-4 (e-book)

Legal Deposit: BU-206. – 2014

Photocomposition: Rico Adrados, S.L. (Burgos)
Print: Rico Adrados, S.L. (Burgos)

5. Conclusions

The OSL dating presented herein defines the age of the El Aculadero site as either in the Eemian interglacial, which ended around 110 ky BP, or in the MIS 4, before c. 63 ky BP. These results rule out not only the earlier datings of the industry, but also the postulated modern ages including the Holocene.

On the Atlantic coast of southern Iberia, a group of comparable sites to El Aculadero have been recorded, all characterized by retouched tools on flake

along with shaped pebble tools. At El Aculadero, the first stages of production are well documented, while at other sites the sub-phases of full production and consumption, represented by significant percentages of retouched tools suggest a more varied range of activities. All of these sites have a common technological identity. This is a local Middle Palaeolithic facies, stretching along a timeline starting in the initial Upper Pleistocene or perhaps earlier. On the basis of known data, it is later than the Acheulean sequences on the Guadalete terraces.

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Cueva de Ardales, Province of Malaga

The Ardales cave (UTM 337.110/4.082.540) is located in a mountain called Cerro de la Calinora 565 m a.s.l. near the village of Ardales about 50 km north of the Mediterranean coast. It was discovered in 1821 after an earthquake exposed a cave entrance previously sealed by colluvial deposits. From 1852 on, the cave was opened to local tourism without recognizing its prehistoric finds. It was Henri Breuil who recognized the Palaeolithic heritage during a visit in 1918 and who first studied the rock art of Ardales cave (Breuil 1921).

The site then lost attention for decades. After a time of scientific standstill, research restarted in 1990 (Ramos *et al.*, 1992). A detailed complete documentation of the artistic inventory was finished after more than 10 years of study in 2005 (Cantalejo *et al.*, 2006). From 2011-2013, first limited excavations were conducted in the entrance area (Fig. 1) and coring outside the front of the cave took place (Ramos *et al.*, 2014). The site is a multi-branched karstic system that is separated into five areas: Area I (Sala

del Saco), area II (Sala de las Estrellas), area III (Galería de los Laberintos), area IV (Calvario) and area V (Galerías Altas). This later area was discovered in 1981 by speleologists. It is a separate cave system above the main cave area. Today the Galerías Altas are accessible only by a narrow fissure that can be reached from the Galeria del Arquero by climbing vertically about 18 m high. The natural entrance to this area was probably sealed by a slide in the late Holocene. Coring outside of the original entrance area of the Galerías Altas in 2011 provided evidence for such an entrance. This part of the cave has not yet been analysed systematically. But, burials from Copper Age and Palaeolithic rock art have been recorded from short expeditions into the Galerías Altas. By sealing off the entrance, prehistoric surfaces including dispersed artefacts and burials have been conserved perfectly.

The galleries of Ardales cave have a total extension of more than 1,500 m. The cave is accessible today via a system of stairs, which was constructed by its first owner Doña Trinidad Grund in the mid-

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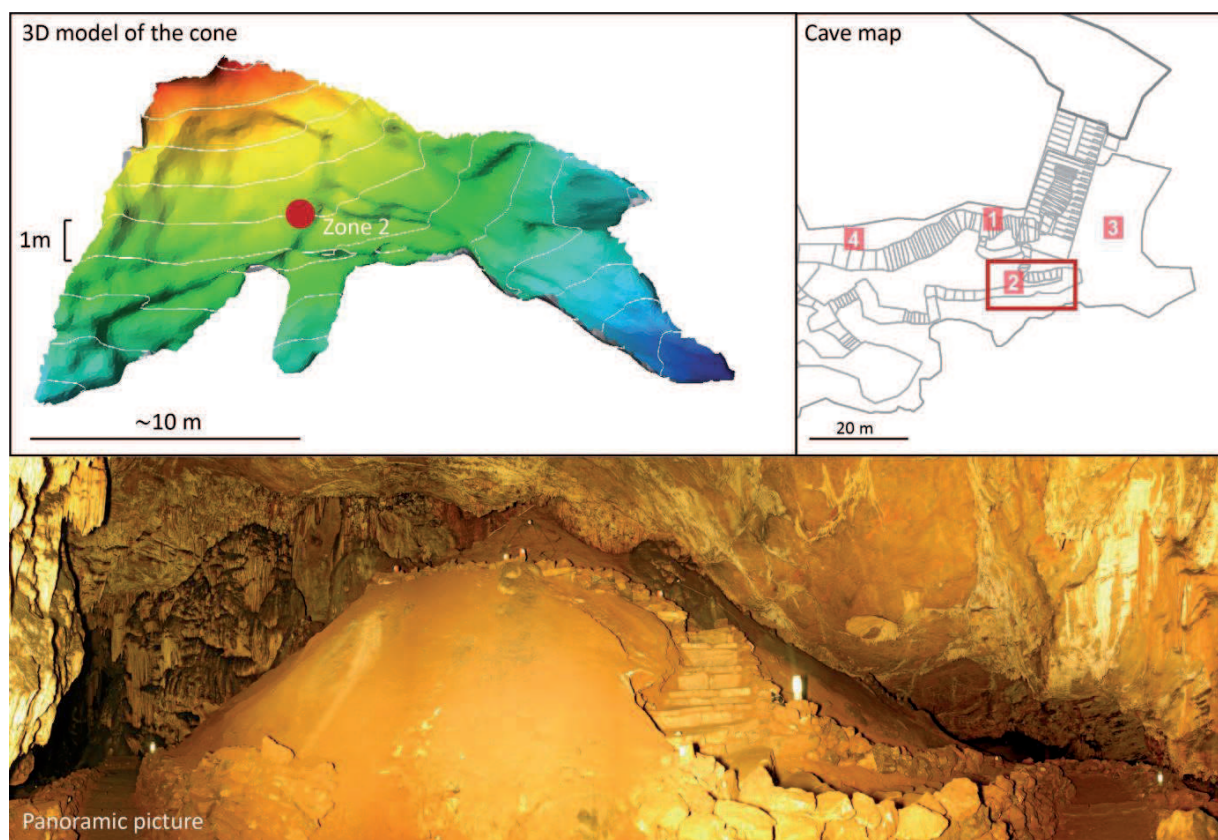


Figure 1. The entrance cone of Ardales cave. Test excavations are marked by red figures (1-4). The red square marks Zone 2 with a multi-layered stratigraphy

dle of the 19th century. The stairs were cut into a steep sediment cone that stretches over 20 m from the opening of the cavity down to the Sala de Estrellas (Fig. 1). The cone is the result of frequent sediment deposition from the slope above the cave entrance.

Ardales cave is outstanding in Southern Iberia for its numerous examples of paintings and engravings from the Upper Palaeolithic. Breuil described in his first analysis about 20 animal figures from 10 panels. Until today, 1010 pictorial artefacts have been described from 252 different sites (Cantalejo *et al.*, 2006 and 2014 b). These include 787 signs, 106 unclassified motifs, 98 animal figures, 10 human figures and 9 hand stencils – positives as well as negatives. All kind of surfaces were used for artistic expression: walls, ceilings, grounds, speleothems and blocks. Within the animal representations cervids dominate (64%) followed by equids (26%), others are statistically of minor importance. From the cervids 85% represent females. Two depictions of

birds, including a flamingo (Fig. 2), one reptile and a fish are noteworthy.

The chronology of the rock art is divided by stylistic analysis into three stages. The initial phase is supposed to represent a Gravettian chronology followed by the middle phase equal to the Solutrean and a final phase attributed to the Magdalenian. Beside the pictorial artefacts an important number of additional finds linked to the human use of the cave have been conserved. These are stone or bone tools placed near the panels with rock art, which might have been used for engravings, paste of red and brown pigments, stone containers used as pigment palettes (Fig. 3) and stone lamps used for artificial lighting (Fig. 4). To date 13 artefacts probably linked to the artificial illumination of the cave were found. Beside mobile stone lamps, immobile lamps made by reshaping of stalagmite bases and very limited micro combustion areas indicated by small heaps of charcoal are documented (Cantalejo *et al.*, 2014 a). A research program for residue analysis by Raman

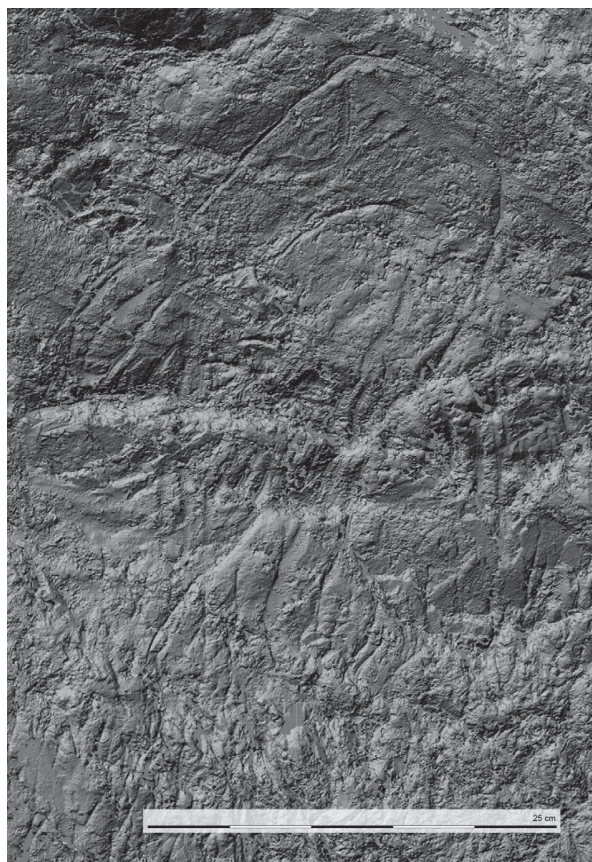


Figure 2. Engraving of a flamingo scanned with a structured light scanner (Breuckmann SmartScan).

spectroscopy and radiocarbon dating of charcoal of these items is in progress.

Limited test excavations conducted from 2011-2013 at the entrance cone give first results for the absolute chronology of Ardales cave. The entrance cone of the cave (Fig. 1) was originally covered by a stalagmitic crust that was partly destroyed during the construction work of the stairs in the 19th century. In archaeological zone 2 (Fig. 1 and Fig. 5) a multi-layered stratigraphy could be recognized. Below the first and the second stalagmitic crust sediments belonging to the Holocene could be detected together with a small number of ceramics, lithics and fragments from a human cranium. Three radiocarbon dates from charcoal (COL 1640: $3,718 \pm 40$ yrs BP; COL 1637: $3,621 \pm 35$ yrs BP; COL 1636: $3,885 \pm 36$ yrs BP) indicate a chronology for the Copper Age. Below the second crust Pleistocene sediments were found. A radiocarbon date from

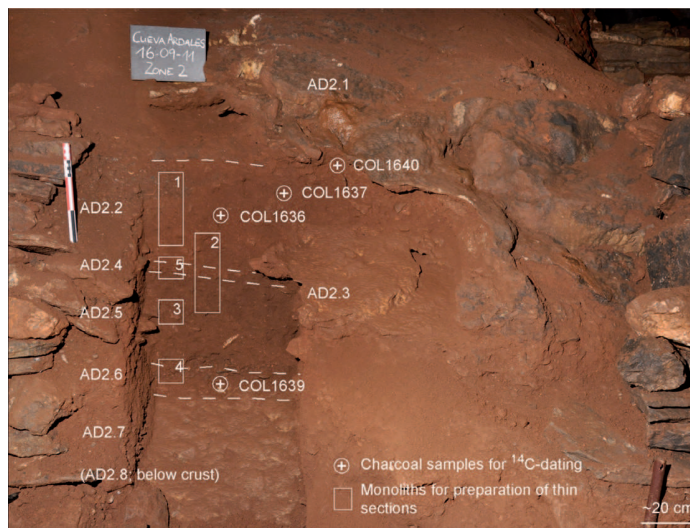


Figure 3. Profile of Zone 2. The bottom of the sequence immediately above the third stalagmitic crust is dated to $15,945 \pm 60$ yrs BP. The top of sequence is dated to $3,718 \pm 40$ yrs BP (all dates uncalibrated).

a charcoal sample immediately above the third crust (COL 1639: $15,945 \pm 60$ yrs BP) suggests a Solutrean age. Bone fragments and a burin were associated with the sample. Sediments continue below the third crust. Manual drilling was performed using a soil auger, which reached a depth of 35 cm below the crust. The chronology of the sequence is supported by pollen analysis that indicates from the third crust to the top an increase of temperature and humidity (Ruiz Zapata and Gil García 2014).

The Holocene occupation of the cave is further supported by radiocarbon dates from test excavations of zone 4. Here charcoal samples from a nearby combustion feature indicate the same chronology as the upper part of zone 2. In zone 3, two charcoal samples gave results of more than 50 kyrs BP. The very small test excavation gave an additional result from a bone fragment of *Felis silvestris* of Holocene age (COL 2011.1.1: $5,562 \pm 48$ yrs BP). The contradicting dates need further sampling and expansion of the test excavation. Confirmation of a Middle Palaeolithic chronology would be in agreement with the observation that during the remodelling in front of the cave for the construction of the entrance building lithic artefacts of Middle Palaeolithic technology were discovered. Additionally, 200 m downslope of the actual cave entrance a Middle Palaeolithic surface

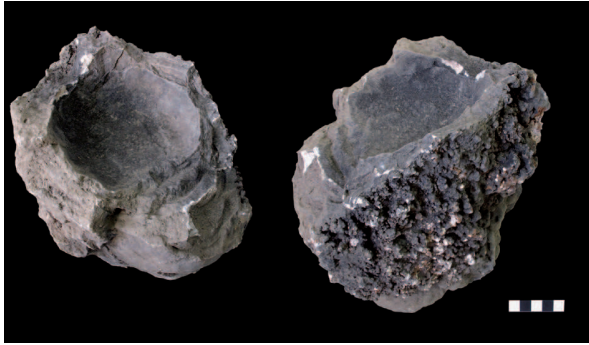


Figure 4. Top part of a stalagmite that was struck from the stalagmite, turned around and then used as lamp

site La Cucarra has delivered a rich lithic assemblage.

The recent test excavations in the entrance cone of Ardales cave give new insight into the human occupation of the site. A Holocene and late Pleistocene occupation could be confirmed. Due to the steep topography of the entrance hall no suitable space for an occupation was available in the mouth of the cave in pre-

historic times. Only in front of the cave or inside at the foot of the steep cone plane surfaces were available. A study of lighting conditions by ray tracing gives evidence that the cone area inside the cave was basically without day light in prehistoric times (Hoffmeister *et al.*, i.p.). Occupation and movement in the cave was possible only with the help of artificial light by fire or lamps. The number of finds that document artificial illumination in the cave represent an important sample for further analysis. Holocene occupation was probably linked to burial activities, while Pleistocene occupations were probably related to art activities. A great number of surface finds like lithics and other artefacts as well as human bones and animal bones are still in original position. Some of them are coated by thin stalagmitic layers. The ongoing study of their distribution in relation to the network of paths and items of rock art will give important insight into the human use of the cave. The blend of a rich record of rock art distributed over the whole interior with an excellent surface preservation of many areas of Ardales cave are a most valued resource for the study of past human behaviour.

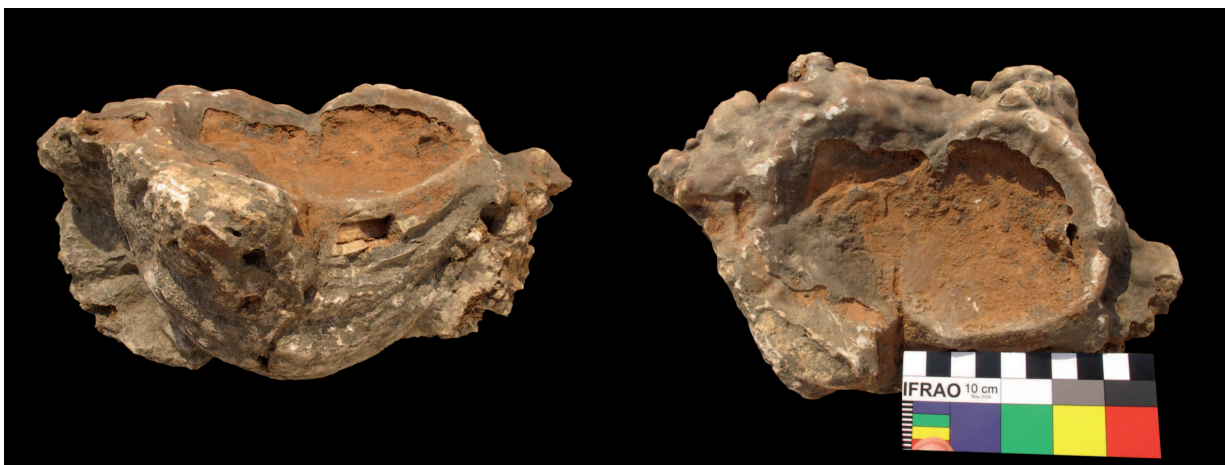
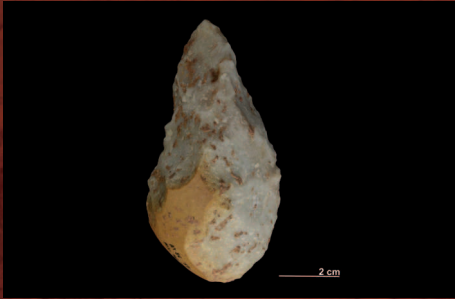
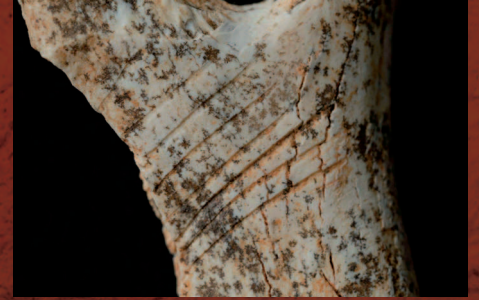


Figure 5. Top part of a stalagmite that was used as container for pigment.



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