

## Research Article

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# The First Neolithic Occupation of La Cova del Randero (Pedreguer, Alicante, Spain)

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**Abstract:** The excavations at “Cova del Randero” (Pedreguer, Alicante, Spain) began in 2007 within the programme of archaeological interventions of the Archaeological Museum of Alicante. The cavity, located in one of the valleys that connect the coast with the inland mountains, presents a wide sequence of occupations that begins in the Upper Palaeolithic and continues throughout the different phases of the Neolithic. The results of a multidisciplinary study, carried out in an archaeological context associated with the first Neolithic presence of the cavity, are presented here. This occupation is defined by a unique combustion structure to which a set of artefacts and biofacts are linked. This archaeological context, probably of a specific nature, is related to the first agro-pastoral communities settled in the area. The fireplace is well defined stratigraphically and sedimentologically because of its reddish soil, which corresponds to hunter-gatherer occupation levels of the cavity, and under the greyish sediments that characterise the use of the cave as a fold during the Middle Neolithic. This occupation event was dated both by the associated materials, among which a fragment of cardial ceramic was found, and by radiocarbon dating of a metacarpus of *Ovis aries* around 5075–4910 cal BC (epicardial Early Neolithic). This data allows us to link the occupation of the cavity at this time with pastoral activity in a medium mountain environment. However, it also allows us to infer the environmental characteristics in which the first farming communities of the mountains of Alicante were developed.

**Keywords:** fire, cave, settlement, Neolithic, epicardial

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## 1 Introduction

The archaeological studies in the Cova del Randero began in 2007 and continue to this day. They are being carried out as a part of the archaeological intervention programme of the Archaeological Museum of Alicante (MARQ), under the direction of Jorge A. Soler, Consuelo Roca de Togores, Olga Gómez, and Elisa Domènech. This cave is exceptional in terms of understanding the Middle Neolithic when it was used as a cattle fold cave as it shows the combustion stains characteristic of livestock herding. In terms of material culture, the pottery with combed and sgraffito decoration stands out, which is characteristic of the second half of the fifth millennium BC. Prior to this use, the cave shows occasional occupation dated to the Neolithic Epicardial defined by a combustion structure and the materials associated with it. After its study, it is possible to estimate the existence of an epicardial ascription, on the one hand, due to the radiocarbon dating that places this occupation between the sixth and fifth millennium BC and, on the other hand, due to the material remains, ceramics with decorations of impressed and incised tools and some small impressed cardial fragments. This evidence allows us to speak of a possibly punctual occupation due to the small number of materials and associated structures.

## 2 Location and Description of the Cave

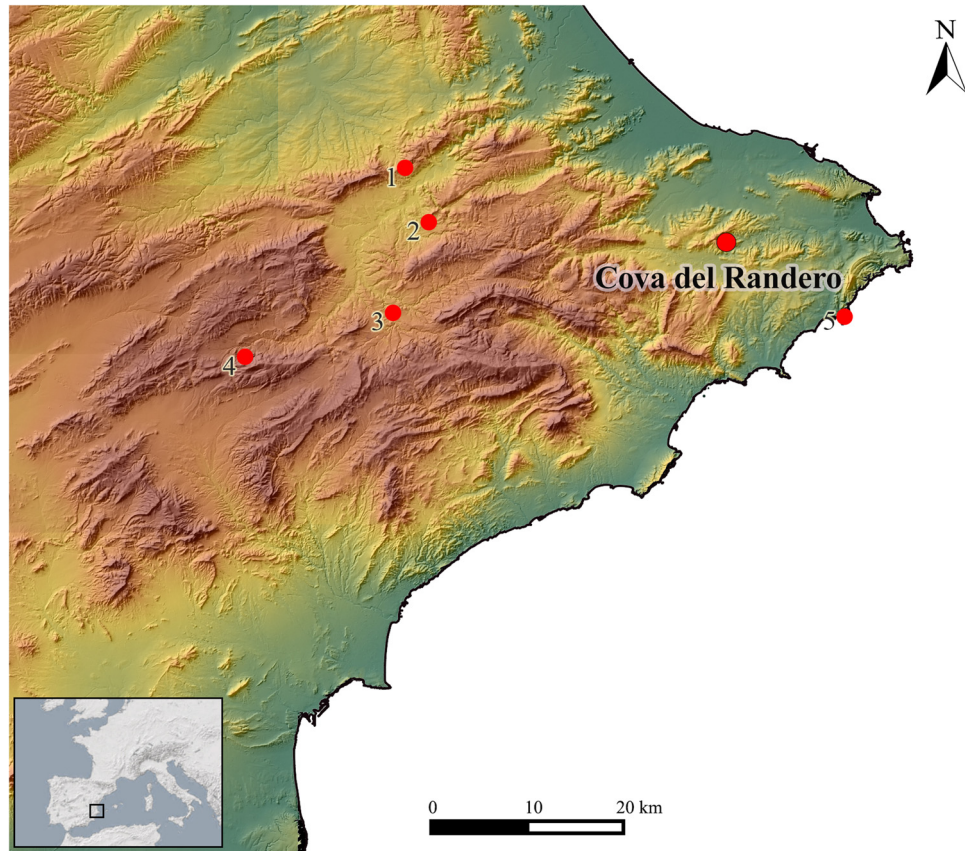
The Cova del Randero is located in Pedreguer, in the province of Alicante, Spain. It is situated on the left bank of the Barranquet de la Llosa, a tributary of the Barranc de l'Alberca, 100 m north of its course, on the southern slope of the Seguili limestone mountain. The geographical coordinates of the entrance are 671037 X 4296588 Y in ETRS89 zone 30, 163 m above sea level. It opens out onto the sunny side of a small valley, between the inland plain of Xaló and the coastal plain of the Marina Alta, displaying typical characteristics of Alicante mountain valleys with straight hillsides of almost 30% inclination, on tertiary limestone and sandy limestone with barely any sedimentary formations, and soils, facing the opposite slopes, with flattened surfaces and edaphic formations on loams and steep ridges (IGME – Geological and Mining Institute of Spain) (Figures 1 and 2).

This is a karst cave controlled by a system of fractures regularly oriented to one of the tectonic axes of the area (quasi W/E). Thus, a series of fracture axes, joints, and longitudinal lines of stratigraphic weakness can be identified that defines the geometry of the cave and its spaces. The entrance, NW-oriented, leads to a corridor over 2.5 m wide and almost 5 m long, which opens to the entrance hall (EH). At present, the difference in level between the entrance, which preserves the natural level of fill, and this room, which has been emptied by more than a metre, is bridged by a steep ramp that extends a few metres into the room. Due to its size and proximity to the entrance, the EH is the main space of the cavity. The EH has access to three spaces, which were filled in 2007: the left gallery (LG), the central gallery (CG), and the right gallery (RG).

The CG is covered by slanted walls that converge in a gable roof and has prominent karst columns in its northern part. After its excavation, a series of spaces longitudinally articulated from W to E, which open around the main fracture and other parallel ones, give way to the interior of the cavity. From the CG, access is gained to the Interior Hall (IH), a larger space with a similar ceiling and structure, fitted out with different speleothems. From this room, on the north side, there is access to the gallery of the interior hall A and the gallery of the interior hall B.

## 3 The Epicardial Occupation: EH and Combustion Structure. Absolute Dating

The EH is a 93 m<sup>2</sup> open space (15.8 × 7.4 m at its largest dimensions). It was greatly affected by the irregular excavations in the 1970s when the area was emptied to be used as a storage area (Soler, 2002, pp. 197–198).



**Figure 1:** Location of the Cova del Randero. (1) Cova de l'Or, (2) Cova d'En Pardo, (3) Cova de la Sarsa, (4) Abric de la Falguera, and (5) Cova de les Cendres.

After the first archaeological prospecting, a vast archaeological level was discovered which, based on its material culture, belonged to the Neolithic period. This level was characterised by the production of combed ware and ceramics with sgraffito decoration.

Below this post-cardial level, which can be identified as the IC-IIA horizons of the Valencian regional sequence (Bernabeu, 1989), reddish soils with materials characteristic of the Palaeolithic occupation were observed in the southern part and near the RG. Initially, this contact led us to consider that, as far as the Neolithic phases were concerned, the cave began its sequence with a strong greyish level typical of the Middle Neolithic. Nevertheless, during the 2010 archaeological excavation, a combustion structure (hearth) was found located in the most central and highest part of the room (3.5 m) in front of the entrance to the LG (Figure 3).

The chimney is formed by an accumulation of small- and medium-sized stones (structure UE 125) on an ash stain (stratum UE 127) located on a layer of untouched reddish colouring (UE 126). It is located on red soil that differs from the anthropised grey that is characteristic of the use of the cavity as a post-cardial sheepfold. The radiocarbon dating of this structure *Beta 333980*:  $6090 \pm 30$  BP has been obtained from a bone sample of the left metacarpal bone of a domestic sheep (*Ovis aries* L.) found in the hearth structure. Its expression, calibrated at two sigmas 5205–4854 cal BC, places the archaeological object in the context of the *Early Epicardial Neolithic*, Neolithic IB of the Valencian regional sequence (Bernabeu, 1989, p. 117). The hearth is associated with ceramic materials, among which a fragment of cardial-impressed pottery has been discovered. This is a clear indication of the possible occupation of the cave in the sixth millennium BC, found on a sediment characteristic of the use of the cave by hunter-gatherers (Soler, Gómez, & Roca de Togores, 2014), of which there are traces dating back to the Magdalenian (Table 1).



Figure 2: Planimetry of the cave and sections of the EH.

#### 4 Sedimentological Interpretation of the Stratigraphic Units

The combustion structure is formed by the accumulation of ashes and coals (UE 127) covered by pebbles and limestone blocks, including some red clays (UE 125). Part of this coarse fraction is thermo-altered, indicating that it would have formed part of the structure.

Below this archaeological ensemble, the known stratigraphic sequence begins with a layer of yellowish-red silts and clays with some limestone gravels (UE 115), and a small deposit of red clays (UE 126) as the base of the bonfire. The superimposed levels (UEs 117 and 113) are formed by sediments with



**Figure 3:** The EH and the hearth.

a fine loamy texture and colours ranging from reddish-brown to dark brown. Finally, after the described series of natural sediments that frame the structure, the deposition of anthropic contributions related to livestock stabling in the cave begins described as *fumiers* (Soler *et al.*, in press).

The lower levels are the result of very low-energy water streams, such as diffuse flows and decantation processes. These flows transport sediments originating from the erosion of the slope in this area. The deposits were formed in a phase of active morphogenesis. The archaeological remains documented in these levels, in a secondary position, date from the Mesolithic and Magdalenian cultures. These data place their formation in a period ranging from the beginning of the Holocene to the first phases of the Middle Holocene.

The upper natural levels, UEs 117 and 113, are formed by sediments also resulting from detrital input from the slope, in this case in the form of mudflows. According to the archaeological data, at least in their

**Table 1:** Dating available for the Epicardial Early Neolithic at the Cova del Randero. Calibrated to 2 sigmas by INTCAL 2020 curve (Reimer *et al.*, 2020) using Oxcal 4.4.2 software

Sample	Context	Ref. lab.	BP	cal BC 2s	15N/14N	13C/12C
Metacarpus <i>Ovis aries</i> L.	UE 125 (Hearth, EH)	Beta-333980	6090 ± 30	5206–5173 (8.9%) 5072–4901 (85.6%) 4864–4853 (1.0%)	—	–15.5 (per mille)

final phases, they correspond to a period of occupation of the combed ware production, at the end of the Middle Holocene (before 6 kcal BP).

The dating of the structure to an early Neolithic phase suggests that there was a significant sedimentary hiatus between the formation of the underlying and overlying units, despite the continuity of sedimentary features. A similar succession in the Cova d'En Pardo (Ferrer García, 2012), also in part of the Middle Holocene, was interpreted as the result of the combination of climatic phases such as arid periods of active morphogenesis with wetter phases, which would be responsible for these hiatuses.

## 5 The Pottery

The ceramic materials studied come from the excavations carried out between 2008 and 2020 in the different rooms of the Cova del Randero (Soler et al., 2014, 2016). In total, 5,413 ceramic fragments belonging to the Neolithic have been recovered, 103 of which could be ascribed to the Epicardial Neolithic due to the presence of decorations made with cardial printing (2 fragments), tool-printed decorations (29 fragments), incised decorations (47 fragments), incised-printed decorations (6 fragments), and decorations made with cords or manually (19 fragments). However, a series of morphological characteristics can be found, such as ribbon handles, which are related to Early Neolithic times, with five examples having been documented in Randero, three of them decorated with impressions made with a simple tool.

Among the vessels that still have sufficient profile to determine their typology, we find two medium-sized globular pots (class C, group 13 by Bernabeu, Molina, Guitart, & García Borja, 2009), two vessels with an S-shaped profile (class C, group 9 by Bernabeu et al., 2009), a possible pitcher (class C, group 9 by Bernabeu et al., 2009), and a large storage vessel decorated with cords and a ribbon handle (class C, group 9 by Bernabeu et al., 2009).

At the decorative level, a single vessel with cardial impressions was documented, consisting of two fragments, one of which is related to the combustion structure. The decorative composition consists of a horizontal band of *Cerastoderma edule*'s natis impressions and a band of oblique cardial impressions below it from which vertical bands alternate with undecorated spaces, a composition known as “zoned” Cardial (Manen, 2002). However, the impressed vessels are made with a simple pointed tool. They are simple compositions of horizontal bands, in some cases with a single row of impressions and others with up to two rows. The incisions appear in most cases combined with tool impressions, with the predominance of triangle motifs that usually form bands running along the upper and central part of the vessel. Containers with artistic decoration show a combination of smooth vertical, horizontal, and, in some cases, oblique cords extending at least along the upper part of the vase. There are also fragments with cords decorated with tool or fingernail impressions (Figure 4).

This ceramic assemblage finds a series of parallels in the Valencian territory. Such is the case of phase VI (H15a) from the Cova de les Cendres, with similarities in terms of the motifs of horizontal bands with tool impressions, plain and impressed cords, and incised triangles sometimes combined with impressions (Bernabeu et al., 2009). In the Cova de l'Or, we find these types of decorative techniques and motifs in phase IV and the initial layers of level III, although the record begins to be scarcer in comparison with previous phases as occupation from this time onwards is less intensive (García-Borja, Cortell, Pardo & Pérez, 2011). Level VII of the Cova d'En Pardo also presents materials characteristic of the Neolithic IB or Epicardial with impressed cardial decorations together with tool impressions, incised-impressed, and relief decorations (Soler, Ferrer, Roca de Togores, & García Atiénzar, 2008). In the Cova de la Sarsa, although there are some fragments with tool impressions and incisions (sometimes combined with combing), they could belong to the Epicardial Neolithic (García Borja, 2017, p. 192). Finally, other sites with epicardial materials in the area are Abric de la Falguera in its phase VIb (García Puchol & Aura, 2006) or Mas d'Is (Bernabeu, Orozco, Díez, & Molina, 2003).

Therefore, we are dealing with a ceramic ensemble that could be chronologically framed within the Early Epicardial Neolithic period and is typologically characterised by globular vessels, with a composite



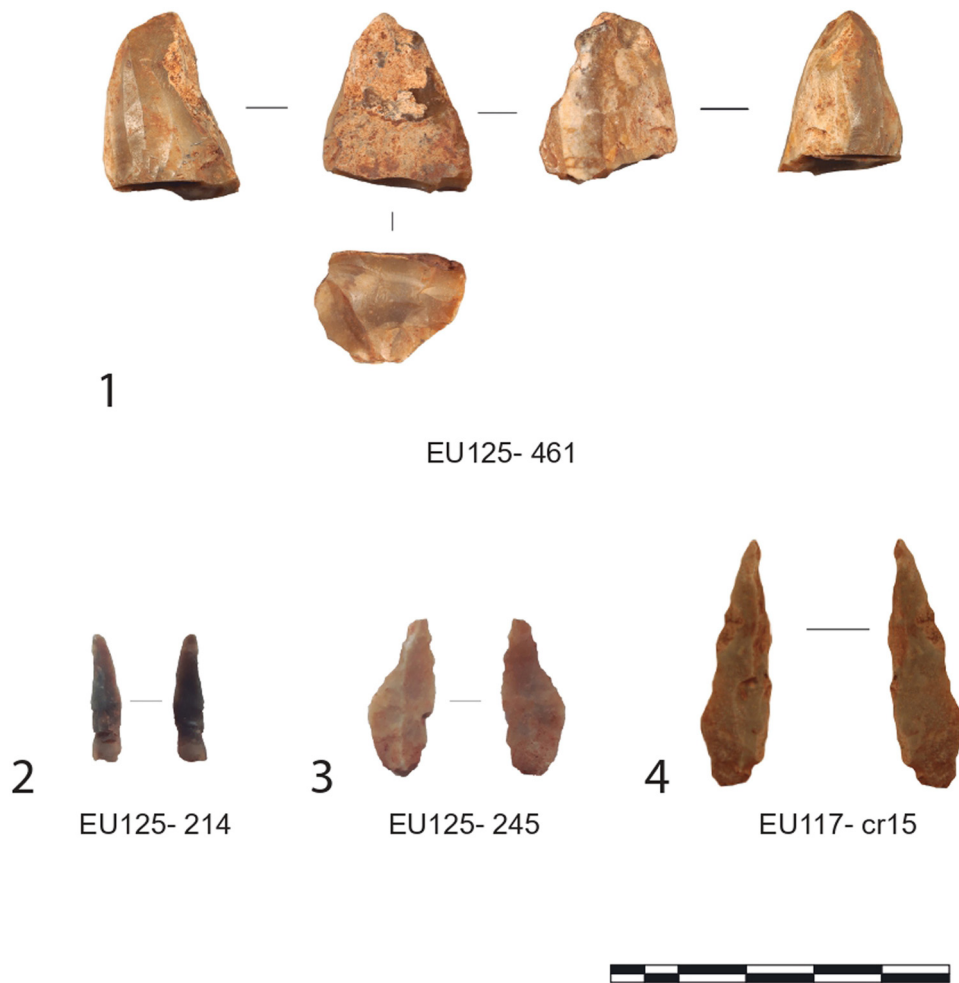
**Figure 4:** Selection of ceramic fragments with possible epicardial ascription. (1) Cardial impression; (2 and 6) finger impressions; (3–5 and 7–8) tool impressions; (9 and 12) incised impressions; (10 and 11) cords; and (13–15) ribbon handles with impressions.

profile and the presence of some storage vessels. Among the decorations are those made with tool impressions, incised-impressed, incised, handmade, and a very low percentage of cardial impressions -only two fragments of the same vessel. Most of the fragments identified were found in the EH, where the hearth belonging to this chronological period is located, although some of the fragments appear in other rooms of the cave, possibly as a result of the different post-depositional processes.

## 6 The Lithic Industry

The lithic industry related to the combustion structure constitutes an ensemble with an abundant presence of knapping remains and small flakes, the result of knapping *in situ* around the combustion structure. Also of note is the presence of blades and microblades, six cores, and a scraper.

There are a total of 39 pieces of blades and microblades, and only three of them have been retouched, these being of a direct and continuous type. As for the fracture level, it is worth noting that 21 of them are complete, meaning that only half of the set is fractured. In addition, signs of use can be observed on some of the edges. All of this suggests the active use of these pieces in the immediate surroundings of the combustion structure.



**Figure 5:** Selection of lithic pieces from the study. (1) Pyramidal core and (2-4) blade-like support elements.



Analysing the complete blades, it can be noted that the longitudinal measurements range from 20 to 45 mm. The width of these pieces varies between 11 and 18 mm. Their thicknesses range between 2 and 6 mm. In the case of the microblades, it is observed that the longitudinal measurements are diverse, ranging from 10 to 32 mm in length. The same applies to the width, which ranges from 5 to 11 mm, and the predominant thickness is between 2 and 3 mm.

Flakes constitute 13% of the total and among these pieces, four have remains of the cortex, two on the anverse obverse and the other two in the distal or proximal area. There are hardly any signs of retouching or thermal alteration, except for a couple of pieces. The retouching is direct and continuous. Thermal alteration manifests itself as domes in one case and as alteration of the raw material in the other.

Almost 50% of the flint pieces discovered are fragments or remains derived from the knapping of cores or the modelling of tools. These pieces stand out because they mostly show remains of the cortex and thermal alteration. Regarding the cores, in turn, some also show signs of thermal alteration. In general, they are quite exhausted and show negatives that suggest blade knapping in its last phase of exploitation. However, there is one non-exhausted pyramid-shaped core for blade exploitation among the record, with remains of the cortex and a well-defined platform and frontal area of knapping (Figure 5(1)).

As for the only documented tool, it is a simple scraper on a cortex extraction blade. It has a cortex on the entire front and a direct and continuous retouch in the distal area, which comprises the so-called scraper front, a tool already known and studied in various typological studies (Cabanilles, 2008; Fortea, 1973; Garcia-Puchol, 2002, 2005).

Therefore, it can be concluded that the lithic assemblage found in relation to the combustion structure is directly related to the knapping around it. This knapping is produced from nodules (due to a large number of fragments with remains of cortex), thus forming the core from which the blade elements observed in the record were extracted. Elements of this extraction and shaping work have also been preserved in the record, as it is the case of some knapping remains that seem to come from the cores themselves, or some pieces that show typical elements of the extraction platform cleaning that are prepared in the core.

## 7 Ornamental Elements

Two items of malacological origin were found among the decorative objects. These are two flattened disc-shaped beads, at least one of which was made from a *Cerastoderma* shell or shell fragment (117.47). This bead has a slightly amorphous morphology and the edges are neither regularised nor is the surface completely polished, so that the characteristic ribs of this genus are still visible. The hole was made in a bipolar fashion using a flint-tipped drill.

As for the other bead (117.57), its morphology allows it to be typologically assigned to discoidal beads although in this case it is completely finished. It has polished edges and a uniform morphology, as well as polished ventral and dorsal faces. The drilling was performed in a unipolar fashion, using a flint-tipped drill. It is very likely to have been made from a *Cerastoderma* shell, like the previous one, although the degree of refinement only allows us to know that it is a shell-like object.

In the archaeological literature, these beads are known as “cardium” discoidal beads. They were made from shells of the already mentioned genus and were cut, perforated, and polished until they reached the desired size and morphology. A good example of this can be found at the site of La Cova de la Bernarda (Palma de Gandia, Valencia), where 23 discs were recorded at different stages of manufacture (Pascual, 2005). Although this set is not contextualised, they are exclusive of the Early Neolithic in the central area of the Mediterranean peninsula, having been documented in sites such as the Cova de les Cendres (Pascual, 1998). In other peninsular territories, they are also associated with the Early Neolithic and Middle Neolithic periods (Pascual, 1996, 2005) (Figure 6).

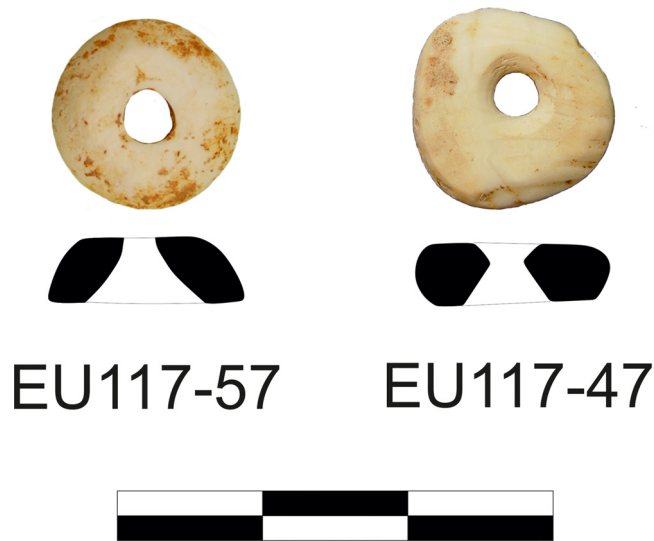


Figure 6: Ornamental elements documented inside the combustion structure.

## 8 The Faunal Record

A collection of animal skeletal remains was recovered from the hearth, many of them with the periosteal surface affected by combustion. The fauna remains included a large number of wild rabbits, most of which were consumed, as indicated by the fracture and ignition marks on their surfaces. A considerable number of infant individuals were also documented. Alongside them, there were possible hare remains. Some fragments belong to the ovicaprid family, where juvenile and infant age specimens have been identified. Within this taxonomic family, the domestic sheep (with a fragment attributed to a young individual, among others) and the domestic goat (with a fragment corresponding to a female specimen) have been recorded as species directly controlled by humans. The domestic pig, much less numerous, is also present. This type of slaughter pattern detected among the ovicaprids denotes the use of livestock for meat and milk production, where the identified female goat plays an important role. This livestock exploitation also occurred in the Cova de les Cendres (Iborra & Martínez, 2009), relatively close to Randero. A similar situation took place in these two caves at synchronous moments in the Early Neolithic. Deer and roe deer were relevant among the wild species, coming from the Holocene biome that invaded the surrounding territory, and so was the

Table 2: Number of remains (NR), minimum number of individuals (MNI), and percentages of the fauna found in the hearth of the EH

Taxa	NR	%	NMI	%
<i>Ovis/Capra</i> (ovicaprids)	56	18.5	9	20.5
<i>Ovis aries</i> (sheep)	4	1.3	2	4.5
<i>Capra hircus</i> (goat)	1	0.3	1	2.3
<i>Sus domesticus</i> (pig)	8	2.6	3	6.8
<i>Cervus elaphus</i> (deer)	14	4.6	3	6.8
<i>Capreolus capreolus</i> (roe deer)	1	0.3	1	2.3
<i>Rana</i> sp. (frog)	4	1.3	2	4.5
<i>Pecten jacobaeus</i>	2	0.6	2	4.5
<i>Cerastoderma edule</i> (cockle)	2	0.6	2	4.5
<i>Lepus capensis</i> (hare)	1	0.3	1	2.3
<i>Oryctolagus cuniculus</i> (rabbit)	210	69.3	18	41
<b>Total</b>	<b>303</b>	<b>100</b>	<b>44</b>	<b>100</b>

presence of amphibians such as frogs, coming from nearby ponds or wetlands. The sample includes shell fragments of marine bivalves of the species *Pecten* and *Cerastoderma* (cockle), which, as in the Cueva de les Cendres, appear in greater profusion in the Early Neolithic.

In the context of the sporadic occupation of the cave, specifically in the EH, we find taphonomic features related to the anthropic episode next to the hearth, where we can infer the manipulation of ovicaprid cattle, consumed for food. The hunting of deer and roe deer and the capture of amphibians are also indicators of the existence of nearby waterlogging (Table 2).

## 9 Cova del Randero in the Epicardial Early Neolithic Period

The occupation of caves in the mountainous area of the north of Alicante was commonplace since the Early Neolithic period. The systematic excavations carried out since 2007 in the Cova del Randero (Pedreguer, Alicante) have uncovered an interesting stratigraphy, which, as far as the Neolithic is concerned, corresponds to several periods of occupation. The post-Cardial levels are very significant, characterised by grey, well-anthropised soils that constitute the fill, the result of the use of the cave for livestock stabling (Soler *et al.*, 2014, in press). In this level, various activities carried out in different areas of the cave have been documented, as corroborated by the associated remains, both of fauna and material culture. Prior to this level, a specific episode was recorded in an area of the EH that coincides with the highest point of the cave ceiling and in a mass of reddish earth that is not very anthropised, evidenced by the discovery of a hearth together with related materials (Soler *et al.*, 2014).

The analysis of the sedimentological characteristics of this epicardial level, in which the hearth structure is found, and the observation of an important sedimentary hiatus between the formation of the underlying and superimposed units suggest a punctual anthropic presence, which is more pronounced in later levels related to the stabling of livestock in the cave. The radiocarbon dates obtained on a sample of domestic sheep (*Ovis aries* L.) referring to a chronology of ca. 5205–4854 cal BC; the study of the ceramic industry with a greater presence of medium-sized globular forms, vessels with an “S” profile and a large storage vessel, whose decorative motifs are incised cords and tool impressions; the analysis of the lithic industry with an abundant presence of small flakes and remains derived from the knapping carried out around the combustion structure; the presence of two disc-shaped beads made from *Cerastoderma* shell; and the analysis of the associated fauna remains, together with the existence of signs of domestic ovicaprid livestock consumption, and the presence of game animals, such as deer and roe deer, lead to conclude that the sporadic presence of these epicardial agro-pastoral societies is related to the cattle and hunting exploitation of the environment, the cave being used as an occasional shelter for shepherds and ovicaprine livestock during the Early Neolithic.

This fact is frequent in similar contexts documented in caves and shelters in the peninsular Mediterranean and French Languedoc. Examples of these sporadic occupations in Alicante have been recorded in the sites of Abric de la Falguera (Alcoi), where an epicardial occupation level (VIb) has been documented with a chronology of  $5655 \pm 54$  BP: 4615–4357 cal BC, obtained by dating a bone remains of a domestic sheep – *Ovis aries* L. – (García Puchol & Aura, 2006); Cova de les Cendres (Teulada-Moraira), whose dating on samples of olea charcoal proves its epicardial use (Phase VI-EVc –  $5930 \pm 90$ : 5035–4556 cal BC 2s and Eva  $5860 \pm 80$ : 4933–4536 cal BC 2s (Bernabeu, Fumanal, & Badal, 2001), as well as the decorative motifs of the ceramic record (Bernabeu *et al.*, 2009). Likewise, dating of  $6265 \pm 75$ : 5463–5018 cal BC 2s (1955–1958) was obtained from a set of cereal samples in the Cova de l’Or (Beniarrés) (Zilhao, 2001), with similar techniques and ceramic decorative motifs to those found in Randero (García Borja, Cortell Pérez, Pardo Gordó, & Pérez Jordá, 2011; Martí Oliver, 2000, 2008, 2011; Martí Oliver *et al.*, 1980; Soler & Pérez, 2020). In the Cova d’En Pardo (Planes), level VII corresponds to the Neolithic IB or Epicardial of the Valencian regional sequence (Bernabeu, 1989), presenting characteristic materials with cardial-impressed, tool-impressed, and incised-impressed decorations and reliefs (Soler *et al.*, 2008) and corresponding in its dating on an ovicaprine vertebra of  $6240 \pm 40$ : 5310–5066 cal BC 2s (Soler, 2012). Another cave further to the south, Cova Sant Martí

(Agost), was occasionally visited for activities related to shepherding, which were combined with a funerary use; their dating, obtained from a fragment of a human humerus from the UE 206 of Exploration 2, established an absolute dating in advanced times of the first half of the fifth millennium BC, corresponding to the Neolithic IC of the regional sequence:  $5740 \pm 40$  BP: 4700–4480 cal BC (Torregrosa, López, & Jover, 2004).

On the Catalan coast and pre-coastal area, a significant effort has been made in recent years to obtain dates for the period ca. 5600–4900 cal making it possible to correlate the ceramic materials, the geographical areas, and the available  $^{14}\text{C}$  dates. Thus, caves are recorded with radiocarbon dates of ca. 5350–5010 cal BC, among which are those of the Cova del Vidre (Roquetes, Tarragona) in its level II and II-home; Cova del Frare – C6 – (Sant Llorenç del Munt, Barcelona) (Oms Arias, 2017) or Cova Colomera – CV10, CE13, and CE14 – (Sant Esteve de la Sarga, Lérida), whose excavations allowed to document a complex structuring of the space, with habitat and livestock stabling functions, with materials associated to the horizon of impressed ceramics and radiocarbon dates (ca. 6200–6000 BP) (Oms et al., 2013).

A similar occupation pattern has been detected among the caves located in the French Languedoc, recording epicardial levels associated with the documentation of impressed and grooved ceramic features, such as Grotte de Camprafaud (Ferrières) in its level c. 18–16, in L’Abri du Roc de Dourgne (Aude), in its level c. 5, and in Grotte Gazel B (Sallèles-Cabardès) (Guilaine et al., 1993; Manen, 2002; in Oms Arias, 2017).

This type of occasional occupation intensified after the fifth millennium BC throughout the Levante peninsular area, when many of these caves became sheepfolds for sheep and goats; the farmyard fires or *fumiers* were the typical result of the sanitising of the remains of livestock stabling. This is the case of sites such as Cova de les Cendres (Iborra & Martínez, 2009); Abric de la Falguera (Pérez Ripoll, 2006); Coves de Santa Maira (Castell de Castells, Alicante) (Aura et al., 2000); Cova d’En Pardo, (Soler, 2012); Cova de l’Or (Martí Oliver, 2000, 2008, 2011; Soler & Pérez, 2020); Cova dels Calderons (La Romana, Alicante) (Torregrosa Giménez & Jover Maestre, 2018); or the Cova del Randero itself (Soler & Roca de Togores, 2012; Soler et al., 2014, inpress). In all of them, the change observed in the material culture record from “epicardial” to “postcardial” traditions is linked to a reorientation of the type of activities, in some cases even leading to the almost complete abandonment of the site (Bernabeu & Molina, 2009).

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## References

- Aura, E., Seguí, J., Pérez Ripoll, M., Verdoso, C., Cotino, F., Pérez-Herrero, C., ... Nebot, B. (2000). Les coves de Santa Maira (Castell de Castells, la Marina Alta-Alacant): Primeros datos arqueológicos y cronológicos. *Recerques del Museu d'Alcoi*, 9, 75–84.
- Bernabeu, J. (1989). *La tradición cultural de las cerámicas impresas en la zona oriental de la península Ibérica* (Serie de Trabajos Varios del SIP, 86). Valencia: Diputación Provincial de Valencia.
- Bernabeu, J., & Molina, Ll. (2009). *La Cova de les Cendres (Morarira-Teulada, Alicante)* (Serie Mayor, 6). Alicante: MARQ.
- Bernabeu, J., Fumanal, M. P., & Badal, E. (2001). *La Cova de les Cendres. Volumen 1. Paleografía y estratigrafía. Estudis Neolítics* 1. Valencia: Universitat de València.
- Bernabeu, J., Molina, Ll., Guitart, I., & García Borja, P. (2009). La cerámica prehistórica: Metodología de análisis e inventario de los materiales. In J. Bernabeu & Ll. Molina (Eds.), *La Cova de les Cendres (Moraira-Teulada)* (pp. 50–178). Alicante: Serie Mayor del MARQ Núm. 6 (CD-adjunto).
- Bernabeu, J., Orozco, T., Díez, A., & Molina, F. J. (2003). Mas d'Is (Penàguila, Alicante): Aldeas y recintos monumentales del neolítico inicial en el Valle del Serpis. *Trabajos de Prehistoria*, 60(2), 39–59.
- Cabanilles, J. J. (2008). *El utillaje de la piedra tallada en la Prehistoria reciente valenciana. Aspectos tipológicos, estilísticos y evolutivos* (Trabajos Varios del SIP, 109). Valencia: Diputación de Valencia.
- Ferrer García, C. (2012). Estudio sedimentológico de la Cova d'En Pardo. Cronoestratigrafía y Paleambiente. In J. A. Soler Díaz (Ed.), *Cova d'En Pardo. Arqueología en la memoria* (pp. 149–166). Alcoy: Fundación MARQ y Ayuntamiento de Alcoy.
- Forte, J. (1973). *Los complejos microlaminares y geométricos del Epipaleolítico mediterráneo español*. Salamanca: Universidad de Salamanca.
- García Atiénzar, G. (2004). *Hábitat y territorio. Aproximación a la ocupación y explotación del territorio en las comarcas centro-meridionales valencianas durante el Neolítico cardial*. Villena: Fundación José María Soler.
- García Atiénzar, G. (2006). Valles, cuevas y abrigos: El paisaje pastoril durante el Neolítico de las comarcas centromeridionales del País Valenciano. In I. Grau (Ed.), *La aplicación de los SIG en la arqueología del paisaje* (pp. 149–170). Alicante: Universidad de Alicante.
- García Atiénzar, G. (2009). *Territorio neolítico. Las primeras comunidades campesinas en la fachada oriental de la península Ibérica (5600–2800 cal BC)* (British Archaeological Reports, i.s. 2021). Oxford: Archaeopress.
- García Borja, P. (2017). *Las cerámicas neolíticas de la Cova de la Sarsa (Bocairent, Valencia)* (Tipología, estilo e identidad (Trabajos Varios del SIP, 120)). Valencia: Museu de Prehistòria de València.
- García Borja, P., Cortell Pérez, E., Pardo Gordó, S., & Pérez Jordá, G. (2011). Las cerámicas de la Cova de l'Or (Beniarrés, Alacant). Tipología y decoración de las colecciones del Museu d'Alcoi. *Recerques del Museu d'Alcoi*, 20, 71–136.
- García-Puchol, O. (2002). *Tecnología y tipología de la piedra tallada durante el proceso de neolitización* (PhD thesis). Universitat de València.
- García-Puchol, O. (2005). *El proceso de neolitización en la fachada Mediterránea de la Península Ibérica. Tecnología y tipología de la piedra tallada* (British archaeological reports, International series 1430). Oxford: Archaeopress.
- García-Puchol, O., & Aura, J. E. (Eds.). (2006). *El Abric de la Falguera (Alcoi, Alacant). 8.000 años de ocupación humana en la cabecera del río Alcoi*. Alcoi: MARQ, Ajuntament d'Alcoi & CAM.
- Guilaine, J., Barbaza, M., Gasco, J., Geddes, D., Coularou, J., Vaquer, J., ... Vernet, J. L. (1993). *Dourgne, derniers chasseurs-collecteurs et pre-miers éleveurs de la Haute-Vallée de l'Aude*. Toulouse: Centre d'Anthropologie des Sociétés Rurales, EHESS.
- Iborra, P., & Martínez, R. (2009). La fauna de los niveles neolíticos de la Cova de les Cendres. In J. Bernabéu & Ll. Molina (Eds.), *La Cova de Les Cendres (Moraira-Teulada, Alicante)* (pp. 149–162). Alicante: Serie Mayor 6. Museo Arqueológico de Alicante (MARQ).
- Jover, F. J., Molina, F. J., & García-Atiénzar, G. (2008). Asentamiento y territorio. La implantación de las primeras comunidades agropastoriles en las tierras meridionales valencianas. In M. S. Hernández, J. A. Soler, & J. A. López (Eds.), *IV congreso del Neolítico Peninsular.2006* (Vol. 1, pp. 90–97). Alicante: Museo Arqueológico de Alicante (MARQ).
- Manen, C. (2002). Structure et identité des styles céramiques du Néolithique ancien entre Rhône et Ebre. *Gallia Préhistoire*, 44, 121–165. doi: 10.3406/galip.2002.2033.
- Martí Oliver, B. (2000). La Cova de l'Or (Beniarrés). In E. Aura Tortosa & J. M. Segura Martí (Eds.), *Catàleg del museu arqueològic municipal camil visedo moltó d'alcoi*. Alcoi: Museo Arqueológico Municipal Camilo Visedo Moltó de Alcoy.
- Martí Oliver, B. (2008). Cuevas, poblados y santuarios neolíticos: Una perspectiva mediterránea. In M. S. Hernández, J. A. Soler Díaz, & J. A. López Padilla (Eds.), *IV Congreso del Neolítico Peninsular* (Vol. 1, pp. 17–27). Alicante: Museo Arqueológico de Alicante (MARQ).
- Martí Oliver, B. (2011). La Cova de l'Or (Beniarrés Alicante). *Saguntum-PLAV-Extra*, 12, 183–816.
- Martí Oliver, B., Pascual Pérez, V., Gallart Martí, D., López García, P., Pérez Ripoll, M., Acuña Hernández, J. D., & Robles Cuenca, F. (1980). *Cova de l'Or (Beniarrés Alicante)*. *Trabajos Varios del SIP*, 65 (Vol. II). València: Museu de Prehistòria de València.
- Merino, J. M. (1980). *Tipología lítica. Munibe* (Suplemento no. 4). San Sebastián: Sociedad de Ciencias Aranzadi.

- Oms Arias, F. X. (2017). Fases y territorios de la neolitización del NE de la Península Ibérica ca. 5600–4900 cal BC. *Munibe*, 68, 155–177. Sociedad de Ciencias Aranzadi: San Sebastián.
- Oms, F. X., López-García, J. M., Mangado, X., Martín, P., Mendiola, S., Morales, J. I., ... Yubero, M. (2013). Hàbitat en Cova i espai pels rams ca. 6200–6000 BP. La Cova Colomera (Prepirineu de Lleida) durant el Neolític Antic. *Saguntum*, 45, 25–38.
- Pascual, J. L. (2005). Los talleres de cuentas de Cardium en el Neolítico peninsular. In R. Ontañón, C. Peredo, G.-M. Piñero, & P. Arias Cabal (Eds.), *Actas del III Congreso del Neolítico en la Península Ibérica* (pp. 277–286). Santander: Universidad de Cantabria.
- Pascual, J. L. (1996). Los adornos del Neolítico I en el País Valenciano. *Recerques del Museu d'Alcoi*, 5, 17–52.
- Pascual, J. L. (1998). *Utilitaje óseo, adornos e ídolos neolíticos valencianos* (Trabajos Varios del SIP, 95). Valencia: Diputación de València.
- Pérez Ripoll, M. (2006). Estudio arqueozoológico del Abric de la Falguera (Alcoi, Alacant). In O. Garcia Puchol & J. E. Aura (Eds.), *El Abric de la Falguera (Alcoi, Alacant). 8000 años de ocupación humana en la cabecera del río de Alcoi* (pp. 120–157). Alcoi: Diputación de Alicante, Fundación MARQ, Ajuntament d'Alcoi & Caja de Ahorros del Mediterráneo.
- Reimer, P., Austin, W., Bard, E., Bayliss, A., Blackwell, P., Bronk Ramsey, C., & Talamo, S. (2020). The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP). *Radiocarbon*, 62(4), 725–757. doi: 10.1017/RDC.2020.41.
- Soler, J. A. (2002). *Cuevas de inhumación múltiple en la Comunidad Valenciana* (Serie Mayor, 2). Alicante: Museo Arqueológico de Alicante (MARQ).
- Soler, J. A. (2012). *Cova d'en Pardo. Arqueología en la Memoria. Excavaciones de M. Tarradell, V. Pascual y E. Llobregat (1961–1965), catálogo de materiales del Museo de Alcoi y estudios a partir de las campañas del MARQ (1993–2007) en la cavidad de Planes, Alicante*. Alicante-Alcoi: Diputación de Alicante, Fundación MARQ, Ajuntament d'Alcoi.
- Soler, J. A., Duque, D. M., Ferrer, C., García, G., Gómez, O., Guillem, P. M., ... Ximénez de Embún, T. (2013). Sobre el significado de la primera ocupación neolítica de la Cova d'En Pardo (Planes, Alicante): Avance de estudio pluridisciplinar de los niveles VIII y VIIIb. *Saguntum*, 45, 9–24.
- Soler, J. A., Ferrer, C., Roca de Togores, C., & García Atiénzar, G. (2008). Cova d' En Pardo (Planes, Alicante). Un avance sobre la secuencia cultural. In M. S. Hernández, J. A. Soler, & J. A. López (Eds.), *IV congreso del Neolítico Peninsular.2006* (Vol. 1, pp. 79–89). Alicante: Museo Arqueológico de Alicante (MARQ).
- Soler, J. A., Gómez, O., & Roca de Togores, C. (2014). Excavaciones en la Cova del Randero (Pedreguer, Alicante). Antecedentes y avance de resultados. Marq, arqueología y museos. (Extra 1). *II Jornadas de arqueología y patrimonio alicantino. Arqueología en Alicante en la primera década del siglo XXI* (pp. 189–195). Alicante: Museo Arqueológico de Alicante (MARQ).
- Soler, J. A., Martínez Amorós, S., Sirvent, L. M., Ferrer, C., Benito, M., Iborra, P., ... Roca de Togores, C. (in press). La Cova del Randero (Pedreguer, Alicante). Nuevas aportaciones para el conocimiento de un ámbito de redil de la segunda mitad del V milenio cal BC. VII congreso internacional del Neolítico de la Península Ibérica, 2020.
- Soler, J. A., & Pérez Jiménez, R. (2020). *Cova de l'Or, Beniarrés: Museo de sitio: investigación, protección y apertura de un santuario del VI milenio aC*. Alicante: Museo Arqueológico de Alicante-MARQ.
- Soler, J. A., & Roca de Togores, C. (2012). In Sección de arqueología del ilustre colegio oficial de doctores y licenciados en filosofía y letras y en ciencias de alicante (Eds.), *Cova del Randero. 4ª Campaña (Pedreguer)*. Intervenciones arqueológicas en la provincia de Alicante. (2010). ISBN: 978-84-695-6558-2.
- Torregrosa Giménez, P., & Jover Maestre, F. J. (Eds.). (2018). *La Cova dels Calderons (La Romana, Alicante)*. Colección Petracos 1. Alicante: INAPH. Universidad de Alicante.
- Torregrosa, P., López, E., & Jover, F. J. (2004). La Cova Sant Martí (Agost, Alicante) y las primeras comunidades neolíticas al sur de la cuenca del Serpis. *Recerques del Museu d'Alcoi*, 13, 9–34.
- Zilhao, J. (2001). Radiocarbon evidence for maritime pioneer colonisation at the origins of farming in west Mediterranean Europe. *Proceedings of the National Academy of Sciences*, 98(24), 14180–14185.