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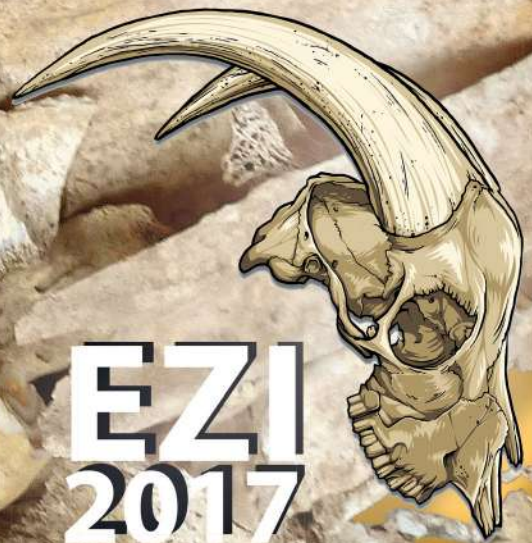
New Trends in Iberian Zooarchaeology

MARIA JOÃO VALENTE
CLEIA DETRY
CLAÚDIA COSTA
(eds.)



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CONTENTS

NEW DATA FOR THE EARLY HOLOCENE IN NORTH-EAST IBERIA: THE FAUNAL RECORD AT COVA DEL SOLÀ DEL PEP (L'HOSPITALET DE L'INFANT, TARRAGONA, SPAIN)

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Abstract
The site of Cova del Solà del Pep is located in L'Hospitalet de l'Infant (Vandellós, Tarragona), 2 km from the modern coastline. It was excavated by Salvador Vilaseca in the 1930s, when four layers with post-Palaeolithic archaeological materials were found. The archaeozoological remains from the second layer, where a "shell-midden" has been cited, are restudied here. Although marine shells (mainly top shells and mussels) are most abundant, mammal remains and lithic objects have also been documented. Shells of terrestrial molluscs and sea urchin plates and spines have been found in smaller quantities. A radiocarbon determination on a *Phorcus turbinatus* shell indicates that the cave was occupied in the late Mesolithic, a period for which hardly any information is available in Catalonia.

Keywords
Marine fauna (molluscs), Terrestrial fauna (mammals), Mesolithic, Catalonia.

Introduction

The so-called 'shell middens' are characteristic early Holocene archaeological sites on Atlantic, but also on the Mediterranean coasts (Román et al. 2020). They consist of accumulations, mainly of marine molluscs but also of terrestrial molluscs, animal bones, charcoal, etc. formed by anthropic action and often hardened into a breccia. The available evidence shows that one such Mediterranean sites is Cova del Solà del Pep in the Province of Tarragona (Spain). It was excavated in the 1930s by Salvador Vilaseca, who collected a large number of faunal remains accompanied by smaller numbers of other archaeological objects. The present paper studies this evidence and determines its cultural ascription. The remains stored in the S. Vilaseca Archaeological Museum in Reus (Tarragona) had not been re-studied or the subject of later publications until the present research reported here.

Research in Cova del Solà del Pep

The archaeological site of Cova del Solà del Pep is located on the south-east side of a small hill called Solà, near the town of L'Hospitalet de l'Infant (Tarragona) about 2 km from the modern coastline (Figure 1). It consists of a cave 22 m wide and 11 m deep, where Salvador Vilaseca performed an excavation (*c.* 3 m^2) in 1934 and documented two archaeological levels (Vilaseca 1937, 1973): an 'upper level', about 15 cm thick,

ÁLVAREZ-FERNÁNDEZ, Esteban, CUETO RAPADO, Marián, ROMÁN, Didac (2022) - New data for the early Holocene in North-East Iberia: the faunal record at Cova del Solà del Pep (l'Hospitalet de l'Infant, Tarragona, Spain). In Valente, Maria João, Detry, Cleia, Costa, Cláudia (eds.), *New Trends in Iberian Zooarchaeology*. Estudos & Memórias 19. Lisboa: UNIARQ - Centro de Arqueologia da Universidade de Lisboa, p. 35-44.
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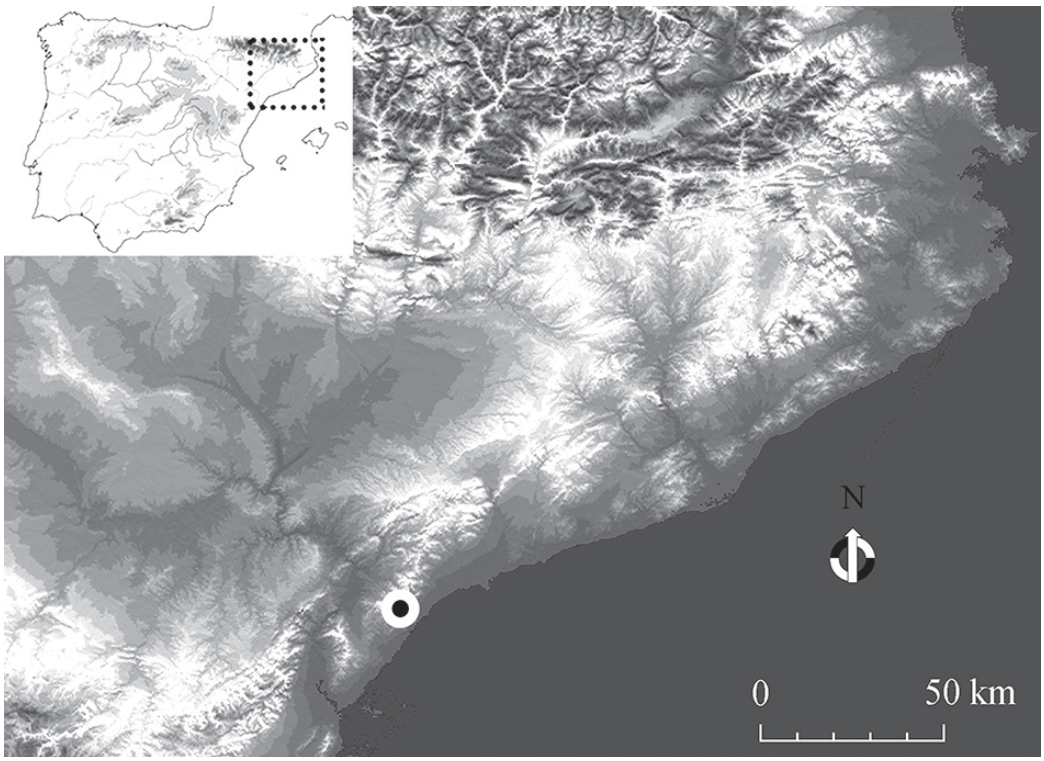

Figure 1 - Figure 1. Location of Cova del Solà del Pep (Tarragona).

in the form of loose sediment containing materials from different times (sherds of modern and Iberian pottery, human and animal bones, etc.); and a 'lower level' formed by calcareous tufa, between 15 and 40 cm thick, sealed at its base by a layer of calcite. Faunal and lithic remains were recorded in this lower level, which was attributed to the Mesolithic. The remains of vertebrates and invertebrates belong to this level. The former was said to include osseous remains of dog, sheep and rabbit; the latter consisted of shells of different marine species (especially those identified as *Trochus turbinatus*), terrestrial species (*Helix* sp.) and sea urchin. This level was superimposed on a barren layer of calcite 2 cm thick, under which a 40 cm thick layer of barren clay overlay the bedrock. Vilaseca indicates that the density of remains documented in the 'lower level' was low, in comparation with other Mediterranean (Hoyo de la Mina) and Atlantic shellmidens (Vilaseca 1937: 257).

Methodology

All the remains on deposit in Salvador de Vilaseca de Reus Archaeological Museum (Tarragona) have been studied.

The mammal remains were analysed following the standard archaeozoological method (Lyman 1994). The anatomical and taxonomical classification has been made with a reference collection and specific osteological atlas (Callou 1997; Hillson 2005; Pales and Garcia 1981; Schmid 1972; Zeder and Heather 2010). When it was not possible to determine the specific taxon, they were grouped in general categories (medium and small size). The age of death of the animals was established following criteria of dental eruption and epiphyseal fusion (Hillson 2005; Bull and Payne 1982). In order to quantify skeletal representation, the Number of Remains (NR) and the Minimum Number of Individuals (MNI) were calculated.

The general characteristics of the marine and terrestrial shells and the sea urchins have been studied in order to determine the species they belong to. The reference collection in the Department of Prehistory, Ancient History and Archaeology at the University of Salamanca was used to classify them. Information about their habitat has been taken from several specific studies, both for molluscs (e.g., Gofas et al. 2011, for marine species; and Welter-Schultes 2012, for continental species) and for the echinoderms (Southward and Campbell 2005). The WoRMS nomenclature was followed for the marine molluscs (WoRMS Editorial Board 2018).

The molluscs were quantified by adapting our study to the methodology proposed by B. Madariaga (1975) and R. Moreno (1994), as applied in other Iberian case studies (e.g., Álvarez-Fernández et al. 2013, 2014). The alterations observed on the remains (epifauna, taphonomic alterations, etc.) have also been analysed.

The archaeofaunal remains from Cova del Solà del Pep have not been weighed either individually or collectively, as they are affected by the precipitation of calcium carbonate and decalcification.

Results

Terrestrial Archeofaunal Remains

A total of 43 mammal osseous remains have been studied, of which 21 have been taxonomically assigned to four species (Table 1). They are all adult wild species, except for the *Sus* sp., which was in its first year of life (Figure 2). They are characteristic mammals of a temperate climate and open woodland vegetation. All the remains are covered by calcium carbonate and consequently it was impossible to study the bone surfaces to identify any anthropic alterations.

The species identified by Vilaseca included dog and sheep. The remains he classified as dog are several vertebrae but in reality, they belong to a medium-sized unidentified herbivore. A carpal bone belongs to a roe deer. No bone remains belonging to sheep have been observed.

Finally the terrestrial archaeozoological remains include a fragmented individual of *Iberus* sp.[1] The shell of this continental gastropod appears to have been affected by heat. It may have been gathered as food in the surroundings of the cave.

	NR	MNI	Age		
			Juvenile	Subadult	Adult
C. capreolus	2	1	-	-	1
Caprinae	12	2	-	-	2
Sus scrofa	1	1	1	-	-
Oryctolagus cuniculus	6	2	-	-	2
Subtotal	**21**	**6**	**1**	**-**	**5**
Medium size	13	-	-	-	-
Small size	2	-	-	-	-
Indeterminate	7	-	-	-	-
Total	**38**	**6**	**1**	**-**	**5**

Table 1 - NR, MNI and age of the different mammal taxa in the lower level at Solà del Pep (Tarragona).

1 S. Vilaseca (1937: 256) states: 'Junt amb els mariscs sortiren fragments de grans conquilles de *Helix, aixafades i inclassificables*.' As in the case of the marine molluscs, the continental mollusc shells documented in the excavation are not present in the collection, except for the *Iberus* sp. shell that has been studied.

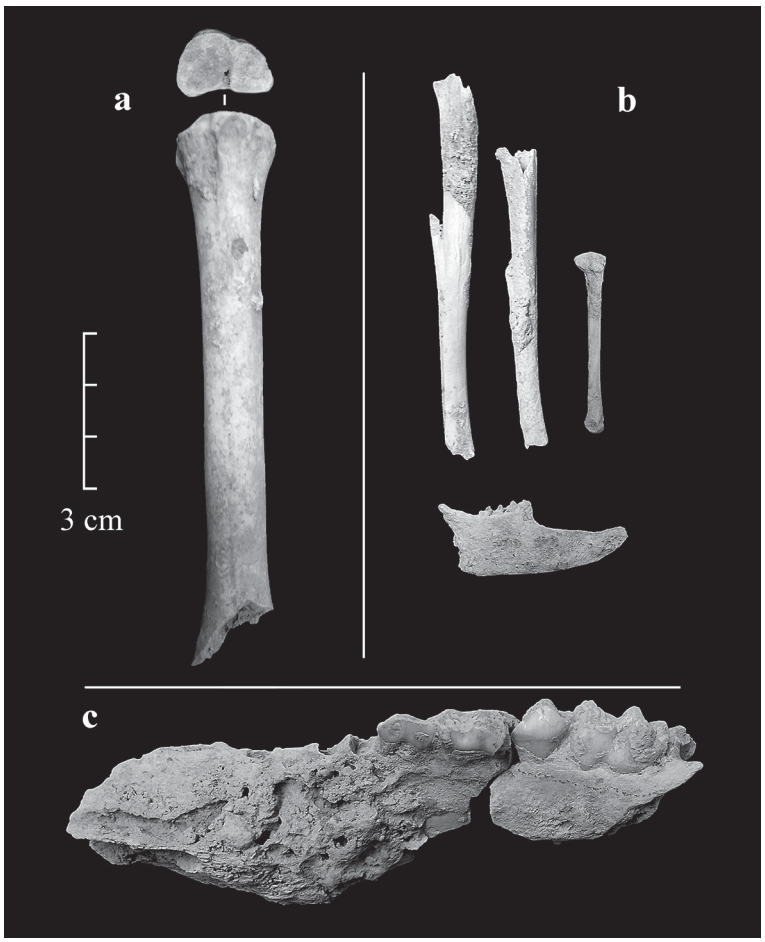

Figure 2 - Solà del Pep (Tarragona), "lower" level. Faunal remains: a) *Capreolus capreolus*; b) *Oryctolagus cuniculus*; c) *Sus* sp.

Marine Archeofaunal Remains

The total number of marine archaeozoological remains is 644; nearly all of them mollusc shells, both gastropods and bivalves (Table 2). In terms of the Number of Remains (NR=641), 95.3% belong to top snails and mussels (*Phorcus turbinatus*: 50.5%; *Mytilus* sp.: 43%).The remaining percentage is formed by the gastropods *Stramonita haemastoma* and *Patella* spp. (the species *P. caerulea* and *P. rustica* have been identified) and the bivalve *Glycymeris* sp. The Minimum Number of Individuals (MNI=233) has been calculated from the NR by taking into account diagnostic parts of the molluscs (apexes in the case of the gastropods and hinges in the bivalves). In this way, 73% are *Phorcus turbinatus*, followed at a distance by *Mytilus* sp. (14%) and *Patella* sp. (11%). The remaining percentage is formed by *Stramonita haemastoma* and *Glycymeris* sp.[2] (Figure 3).

2. S. Vilaseca (1937: 256) cites: '*Anomia ephippium.* Un exemplar enter i tres fragments; *Pectunculus sp.* Un fragment. *Mytilus gallo-provincialis.* Dues valves senceres i vuit trossos. *Mytilus sp.* Un fragment.; *Patella* aspera. Quinze exemplars enters i dotze de trencats; *P. coerulea.* Quatre exemplars; *P. caerulea* var. *subplana.* Tres exemplars; *P. lusitanica,* un exemplar; *Trochus turbinatus.* Tres-cents cinquanta exemplars entre sencers i trencats y alguns fragments de *Murex i Purpu*ra.' Having re-examined the collection, it has been found that not all the remains documented in the excavation are still conserved. For example, the shells of *Anomia ephippium* and those of the Family Muricidae are not present in the collection. Similarly, there are fewer limpets shells, whereas the number of mussels remains is much larger'.

	NR	MNI
*Patella rustica (*Linnaeus 1798)	6	6
Patella caerulea (Linnaeus 1798)	12	12
Patella sp.	18	8
Phorcus turbinatus (Born 1778)	324	170
Stramonita haemastoma (Linnaeus 1767)	5	3
Mytilus sp. (Linnaeus 1798)	275	33
Glycymeris sp.	1	1
Total	**641**	**233**

Table 2 - NR and MNI of the different marine mollusc taxa in the lower level at Solà del Pep (Tarragona).

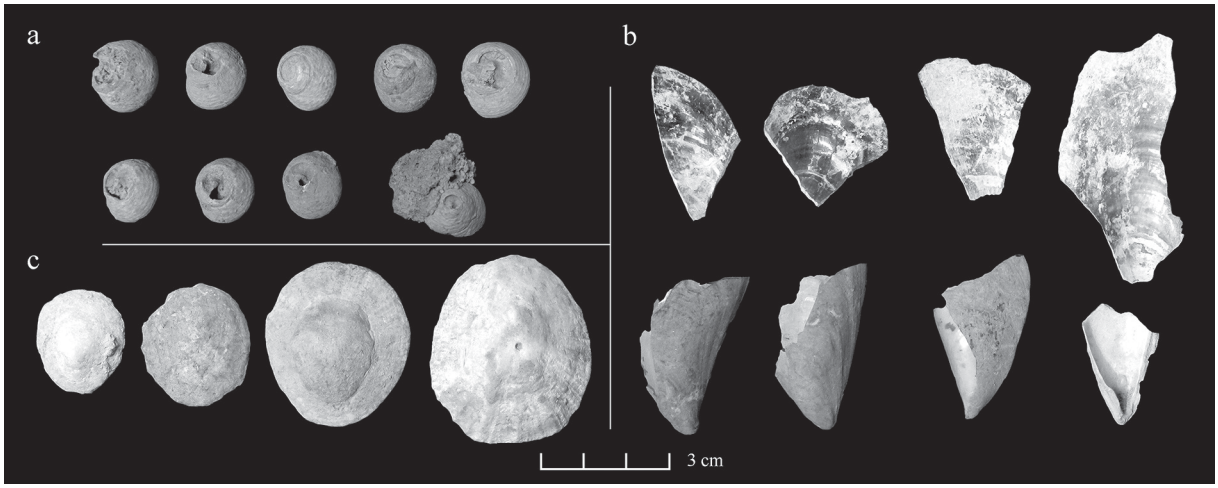

Figure 3 - Solà del Pep (Tarragona), 'lower' level: a) *Phorcus turbinatus*; b) *Mytilus* sp.; c) *Patella* sp.

Alterations to the shell surfaces have been observed. Thus, the start of a hole caused by a perforating organism before the shell was gathered as food has been noted on one of the limpets shells. The fragmented *Glycymeris* sp. valve was eroded on its surface, particularly on the teeth of the hinge, by the action of sea water and sand, which indicates that it was picked up on a beach. Humans, as a taphonomic agent, have also modified the archaeomalacological assemblage. It is fragmented, probably by trampling and this has mostly affected the mussels. Only four of the shells are affected by heat: one mussel and three top snails. It should also be noted that at least 112 of the top shells have lost their apex (*c.* 66% of the individuals). This was equally observed by S. Vilaseca (1937: 257–258), who explained this as intentional breakage by humans to extract the meat. Indeed, by experimentation we have found that if this part of the shell is broken by striking it, the vacuum is eliminated and the meat can be extracted more easily. Finally, it should be added that practically all the remains are covered by precipitated calcium carbonate, which hinders the classification of some of the limpets. In some cases the shells are surrounded by large amounts of concretion, such as the example of five *P. turbinatus* specimens that are encased together.

All the species documented in Cova del Solà del Pep are present today on the Mediterranean coast. The top snails, limpets, mussels and red-mouthed rock shells were gathered by hand on rocky substrates in the eulittoral zone, and probably on the low shore, in more or less wave-beaten areas.

They were probably collected on the shore near the site, which is about two kilometres from the modern coastline. It is likely that the *Glycymeris* sp. valve was gathered on a beach.

In order to determine the chronology of the deposit, a *Phorcus turbinatus* shell was dated by radiocarbon, with a result of 6786 ± 34 BP (OxA-37038, δ13C: 2.0). As a marine species was dated, the reservoir effect has to be considered. The nearest Δ+R value to the Tarragona coast, established for Banyuls (Girona): Δ13: -118±6 (Siani et al. 2000), was applied. With the Marine20 calibration curve (Heaton et al. 2020), the calibrated age of the shell is 5552-5021 cal BC (7501-6970 cal BP).

Finally, together with these mollusc shells, four remains of echinoderms were documented. These are three plate fragments and a fractured spine of a sea urchin (Family Echinidea).[3]

Other archaeological evidence

Very few lithic objects were found during the excavation Solà del Pep and they add little information about the chronology or functionality of the site.

Only three objects have been recorded, as previously published by Vilaseca (1937: 254). They are a blade with a quite irregular trapezoidal cross-section, a blade fragment with a regular trapezoidal cross-section and a slight notch on the left side, and a fragment of a flake (Figure 4).

A hammerstone (Vilaseca's description -in catalan-: *pedra plana de contorn arrodonit artificialment, d'arenisca de gra gros, probablement de formació marina relativament moderna, la qual amidava 12 cm. d'amplària per 4 de gruix. Aquesta pedra té una part de la vora tallant, obtinguda gràcies a un cop d'esclatament donat a cada cara, i presenta un clot central poc profund. de 25 cm. de diàmetre. Fet a cops*) and two macrolithic tools (Vilaseca's description -in catalan-: *dos galets de quarsita aplanats, un de color fosc i l'altre rogenc amb més de mig contorn suprimit i escairat per cops aplicats normalment a les cares i amb senyals d'ús*) are also cited in the Vilaseca´s publication (1937: 256). These three artefacts are not found in our revision of the site, but they could belong to both Neolithic or Mesolithic. In fact, they are common in the regional Mesolithic.

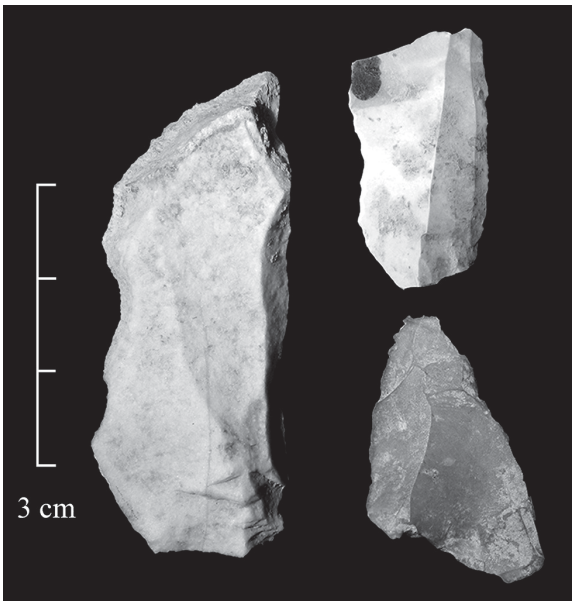

Figure 4 - Solà del Pep (Tarragona), 'lower' level. Lithic artefacts.

3. S. Vilaseca (1937: 256) only cites: 'Dos fragments d'un equínid (*Strongylocentrotus?*)'.

A further two lithic artefacts were found on the hillside in front of the cave: a fragment of a laminar flake and preform of a leaf-shaped point. The references made by S. Vilaseca himself on the box labels does not allow these objects to be related to those found in the excavation: '*Esclat i punta de sageta de sílex blanc = falda de la coveta del Solà del Pep (Sota la Cova*' [Flake and arrowhead in white flint = hillside of Cova del Solà del Pep (below the cave)]. This means that the arrowhead, possibly corresponding to the Late Neolithic, cannot be associated with the other objects that have been found and instead may have come from the disturbed surface level where some prehistoric potsherds were found.

Owing to their characteristics, the three pieces found in the lower level cannot contribute either chrono-cultural or techno-typological data. However, the lack of pottery in this level indicates it can be attributed to a pre-pottery time. In addition, as two of the three pieces are laminar, it also seems that they cannot be linked to the Notches and Denticulates Mesolithic (Ancient Mesolithic).

Discussion

Chronological attribution of the deposit

One of the main issues of the site is related to the radiocarbon date of a top snail shell (*Phorcus turbinatus*). The date of 6786±34 BP is unusual for the north-east of the Iberian Peninsula, and its calibration (5552-5021 cal BC: 7501-6970 cal BP) raises the question of the neolithisation of the area, which is not easily solved with the present data.

The uncalibrated date corresponds to the late Mesolithic, a time just before the arrival of the first Neolithic groups, which closely fits the characteristics of the archaeological assemblage. However, the calibration of the date with the correction of the reservoir effect for marine shells takes us to a slightly later time, in the Early Neolithic, which increases the difficulty in ascribing this level in Cova del Solà del Pep to a particular cultural period, especially when the archaeological remains are so scarce.

From the point of view of the material culture, some fragments of undecorated potsherds together with some Iberian pottery and human remains were cited for the "upper" level in the deposit (Vilaseca 1937: 255). This seems to suggest that this level contains a mixture of remains from different periods, from the Late Neolithic to historical times. No evidence that can be attributed to the Early Neolithic has been documented among those remains. Vilaseca states that no pieces of pottery were found in the 'lower' level, where the remains studied here (mainly marine shells) were excavated. Therefore, the nature of this level means that the most plausible interpretation is to link it with the last hunter-gatherer populations.

The Mesolithic to Neolithic transition in Catalonia

In Catalonia, a relatively large number of archaeological sites contain levels dated in the Epimagdalenian and the Early Mesolithic. This contrasts with the almost total absence of levels attributed clearly to the Geometric Mesolithic (Recent Mesolithic). The Notches and Denticulates Mesolithic (Ancient Mesolitihic) is the only technocomplex dated between 9000 and 8500 cal. BP.

The so-called "Mesolithic Gap" in Catalonia lasted some 500 or 1000 years, between 8500 and 7500 cal BP (Morales and Oms 2012). In that time, the only data comes from three sites although none of these occupations can be characterised precisely:

- Level 19/20 in Can Sadurni (Begues (8240–8000 cal BP), attributed to the Notches and Denticulates Mesolithic (Fullola et al. 2010), but without a detailed study.
- A level in Cova del Vidre (Roquetes) (8240–7960 cal BP), where a lithic triangle was found (Bosch 2015), although its ascription to the Geometric Mesolithic is still unconfirmed.

- Recent excavations in Coves del Fem (Ulldemolins), with several dates between 8040 and 7200 cal BP may provide important information about this period (Bogdanovic et al. 2017). However, as occurs at Solà del Pep, the data are so scanty that they cannot provide sufficient information about the industry to be able to compare the site with other sites of the same age outside Catalonia.

Of these three sites, only Coves del Fem has been dated by radiocarbon to the transition between the last hunter-gatherers and the first Neolithic groups. Additionally, it should be noted that the date from Solà del Pep is about 300 years more recent than the oldest dates that have so far been obtained for the Neolithic in Catalonia at Guixeres de Vilobí (6655±45; OxA-26068, *Ovis/Capra*) and El Cavet (6536±36; OxA-26061, *Triticum*) (Martins et al. 2015; Oms 2017; Oms et al. 2014), i.e. *c.* 5580–5420 cal BC. The date from Solà del Pep is similar to the dates of the Early Neolithic levels in Can Sadurni (Blasco et al. 2005; Edo et al. 2011) and Sant Pau del Camp (Molist et al. 2008).

Conclusions

Despite the large number of prehistoric sites that have been excavated in Catalonia in the twentieth and twenty-first centuries, information about the time immediately before neolithization is practically inexistent. It is clear that this scarcity of data cannot only be due to the erosion of levels or the lack of research interest in this period. It seems that the population of this region must have been quite small when the first farmers arrived (Morales and Oms 2012). However, it should be considered that on the coast, the most appropriate location for occupations at that time, the levels might now be several metres under the sea, which makes them very difficult to find.

Cova del Solà del Pep contains one of the few levels with an archaeological record dated in the early Holocene. The abundance of marine shells compared with other archaeological remains and the precipitated calcium carbonate on them means that it can be interpreted as a 'shell-midden' located a short distance from the shore, similar to those that existed on the Spanish shore of the Bay of Biscay in the Mesolithic. Although it is very likely that the smaller archaeological remains were not collected in the excavation process at Solà del Pep, the documented remains are indicative of an exploitation of the fauna at a time that is little known within Catalan prehistory. The marine mollusc remains show that human groups collected shellfish on the rocks in the inter-tidal zone (mostly top snails but also mussels, limpets and red-mouthed rock shells) and then took them to the cave, where they were probably consumed. Their diet also included roe deer, rabbits, and probably Spanish Ibex and wild boar, and therefore their hunting practices were not specialised. All these species of a temperate climate and open landscapes would have existed in the surroundings of the cave. In contrast, the small lithic assemblage from Solà del Pep is not very characteristic.

While the dated level has yielded very interesting archaeological evidence, the sedimentary context and the methodology of the 1930s excavation should not be forgotten. Although Vilaseca states that the level was clearly intact, with no pottery but macrolithic tools, the early time of the excavation and the lack of documentation about the methodology used means that the stratigraphy in the deposit needs to be re-examined and this level and its relationship with the surface level should be verified *in situ*. This is the only way to guarantee that the dated shell definitely came from the lower level, as explained in the original researcher's descriptions, and that there was no disturbance or contamination from the upper level.

If this lower level at Solà del Pep is considered intact and this is a typical shell-midden, it would be of enormous interest for the Mesolithic to Neolithic transition as it is located in a region, the north-east of the Iberian Peninsula, where very little information about this period is known. This contrasts with

other neighbour regions, such as Lower Aragon and El Maestrazgo in Castellón and Teruel, where a high density of occupations has been documented.

In this way, the lower level in the cave would indicate that the territory was not completely empty when the first Neolithic colonists arrived. If this level is Mesolithic, the replacement of the foraging society by the farming economy in Catalonia would not have been as rapid as is thought. On the contrary, if only the radiocarbon date is considered and the occupation is attributed to the Early Neolithic, it is possible that farming groups used some caves as places where they processed and consumed marine resources (mainly molluscs) in a similar way to previous Mesolithic populations.

With the data presented here and bearing in mind the scarcity of information about the Late Mesolithic in north-east Iberia, Cova del Solà del Pep may represent the start of research on similar sites that can illuminate this complex transition between the last hunter-gatherers and the first farmers on the Mediterranean coast of the Iberian Peninsula.

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