



The use of long blades and projectile points in the Western Mediterranean. Examples from the domestic and funerary sphere

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ABSTRACT

The lithic instruments from periods of recent prehistory, such as the Chalcolithic or the Bronze Age, have received scant attention from researchers. Only a few exceptional cases, such as large flakes or daggers found in funerary contexts, have been analyzed, mainly from a morphological perspective. In this study, we have compiled information from over a decade of analysis on instruments documented in burials and domestic structures in the northeastern region of the Iberian Peninsula. This study is significant as it enables us to evaluate the types of tools selected to be deposited in burials as grave goods and discern the differences compared to those utilized in daily activities. By delving into the use of these instruments, we have been able to construct interpretations not only regarding their function, but also shed light on the societies that employed them.

1. Introduction

This synthesis describes our current knowledge about the use of certain chipped lithic implements (long blades, points, and some flakes) found in the north-east of the Iberian Peninsula at sites dated in the Late Neolithic-Chalcolithic and Bronze Age (Table 1). These implements must have held significant importance for those past communities, bearing in mind the amounts of them found at both domestic and funerary sites. Superb examples of them can be viewed in national, regional and local museums in Spain, France, Italy and Portugal.

It is noteworthy that even though these objects are often found in very special archaeological sites, like dolmens, hypogea and large settlements, very few complete studies have been carried out in which the source of the raw material, technology, morphology and function of the tools are addressed. This paper will concentrate above all on their function, within a focus on two exceptional implement types: long blades and projectile points.

The study is based on numerous sites in north-east Iberia where we have worked in recent years, but the data obtained will also be compared with the results from other funerary and domestic sites in the rest of the peninsula (Table 2).

Thus, first of all, it should be noted that, in the north-east of the Iberian Peninsula, archaeological documentation of the middle Neolithic, about 4500 cal. BC, has revealed the intense circulation of

lithic raw materials across the whole centre-west of the Mediterranean (Gibaja, 2003; Gibaja et al., 2014; Terradas et al., 2014; Masclans et al., 2017). This was made possible by the development of consolidated exchange networks and inter-group relations, associated with a social organisation devoted to the procurement and exportation of those resources. Over time, the exchange networks underwent a transformation in the selection of materials, favoring alternative types of flint, leading to the notable disappearance of the bédoulien flint from Western Provence. In this way, between 3500 and 1500 cal. BC, a series of innovations profoundly transformed the social, economic and ideological structures of those groups. During this period, a series of materials begin to be documented that, owing to their singularity and geographic distribution, are representative of new wide-reaching inter-group networks that differed from those that existed in the Neolithic. Given that the majority of these newly introduced material goods are discovered within mortuary contexts, it is plausible to suggest that their ownership and utilization were likely confined to a select few individuals or collectives. It is important to note that not all individuals were interred in funerary structures, particularly in the case of dolmens. This observation implies that the privilege of such burial practices was likely reserved for a select segment of the population. These indications potentially shed light on the nascent social inequalities that began to take shape during the Late Neolithic and Bronze Age within certain communities.

At archaeological sites of that period, pottery and the first metal

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Table 1

Radiocarbon dating of some sites studied and cited in the text. We do not have datings for all the sites. Many of them were excavated a long time ago. In those cases the chronology is relative based on the archaeological record.

Site	Sample	Code	Datación	References
Costa de Can Martorell	Human bone	LY-7837	3810 ± 55 BP	Mercadal, 2003
Costa de Can Martorell	Human bone	LY-7838	3795 ± 55 BP	Mercadal, 2003
Roques del Sarró	Charcoal	BETA-92207	4670 ± 70 BP	Alonso et al., 2000
Roques del Sarró	Charcoal	BETA-92206	4040 ± 60 BP	Alonso et al., 2000
Roques del Sarró	Charcoal	BETA-92205	3950 ± 90 BP	Alonso et al., 2000
Roques del Sarró	Charcoal	BETA-92208	4830 ± 40 BP	Alonso et al., 2000
Minferri	Charcoal	BETA-164901	4540 ± 40 BP	Nieto et al., 2014; Marín, 2018
Minferri	Faunal bone	BETA-318373	4560 ± 30 BP	Nieto et al., 2014; Marín, 2018
Minferri	Human bone	BETA-181657	3360 ± 50 BP	Nieto et al., 2014; Marín, 2018
Minferri	Seed	BETA-164903	3610 ± 40 BP	Nieto et al., 2014; Marín, 2018
Minferri	Charcoal	UBAR-548	3590 ± 110 BP	Nieto et al., 2014; Marín, 2018
Minferri	Charcoal	UBAR-547	3560 ± 70 BP	Nieto et al., 2014; Marín, 2018
Minferri	Charcoal	UBAR-549	3510 ± 60 BP	Nieto et al., 2014; Marín, 2018
Minferri	Human bone	UBAR-550	3450 ± 150 BP	Nieto et al., 2014; Marín, 2018
Minferri	Charcoal	BETA-92279	3380 ± 70 BP	Nieto et al., 2014; Marín, 2018
Minferri	Faunal bone	BETA-92280	3410 ± 90 BP	Nieto et al., 2014; Marín, 2018
Minferri	Faunal bone	BETA-318367	3430 ± 30 BP	Nieto et al., 2014; Marín, 2018
Minferri	Faunal bone	BETA-318370	3420 ± 280 BP	Nieto et al., 2014; Marín, 2018
Minferri	Charcoal	UBAR-550	3660 ± 280 BP	Nieto et al., 2014; Marín, 2018
Minferri	Faunal bone	BETA-318371	3380 ± 30 BP	Nieto et al., 2014; Marín, 2018
Minferri	Human bone	BETA-318369	3370 ± 30 BP	Nieto et al., 2014; Marín, 2018
Minferri	Human bone	BETA-164178	3360 ± 60 BP	Nieto et al., 2014; Marín, 2018
Minferri	Human bone	BETA-181658	2960 ± 40 BP	Nieto et al., 2014; Marín, 2018
Calle Paris de Cerdanyola	Charcoal	UBAR-817	4110 ± 60 BP	Francès et al., 2007
Calle Paris de Cerdanyola	Human bone	UBAR-860	3870 ± 45 BP	Francès et al., 2007
Calle Paris de Cerdanyola	Human bone	UBAR-1061	3890 ± 45 BP	Francès et al., 2007
Calle Paris de Cerdanyola	Human bone	MAMS-25937	3965 ± 29 BP	Olalde et al., 2018
Calle Paris de Cerdanyola	Human bone	MAMS-25939	3915 ± 29 BP	Olalde et al., 2018
Calle Paris de Cerdanyola	Human bone	MAMS-25940	4051 ± 28 BP	Olalde et al., 2018
Cova de l'Avi	Human bone	OxA-29610	4696 ± 30 BP	Daura et al., 2015
Cova de l'Avi	Human bone	OxA-29611	4703 ± 32 BP	Daura et al., 2015
Cova de la Guineu	Charcoal	OxA-23640	2941 ± 26 BP	Morales et al., 2013
Cova de la Guineu	Charcoal	OxA-23641	3030 ± 26 BP	Morales et al., 2013
Cova de la Guineu	Human bone	OxA-10799	4500 ± 40 BP	Morales et al., 2013
Cova de la Guineu	Human bone	OxA-10799	4335 ± 32 BP	Morales et al., 2013
Mas d'en Boixos	Charcoal	UBOX-20	4355 ± 45 BP	Farré et al., 2002; Marín, 2018

Table 1 (continued)

Site	Sample	Code	Datación	References
Mas d'en Boixos	Human bone	UBAR-758	3350 ± 60 BP	Farré et al., 2002; Marín, 2018
Mas d'en Boixos	Charcoal	UBOX-21	3495 ± 45 BP	Farré et al., 2002; Marín, 2018
Mas d'en Boixos	Human bone	LTL-4237A	3415 ± 40 BP	Farré et al., 2002; Marín, 2018
Mas d'en Boixos	Human bone	UBOX-18	3265 ± 70 BP	Farré et al., 2002; Marín, 2018
Mas d'en Boixos	Faunal bone	LTL-2456A	3203 ± 35 BP	Farré et al., 2002; Marín, 2018
Mas d'en Boixos	Human bone	UBOX-17	3095 ± 50 BP	Farré et al., 2002; Marín, 2018

products have received special attention from the scientific community. Other materials, in contrast, have hardly been studied or only tangentially, usually out of the personal interest of the director of an excavation or researchers who specialise in 'those other objects and materials'. One very notable example is precisely the chipped lithic toolkits. Publications often cite only the most complete objects, describing their morphological characteristics, the type of retouch, their colour and their size. In other words, the most 'outstanding' objects are presented from a stylistic point of view.

Many of the lithic tools under examination originate from sites that were excavated several decades ago. As a result, there exists a significant gap in our understanding of the excavation methodologies employed and the degree to which the preserved remains accurately represent the entirety of the findings. It is plausible that smaller objects, such as minute fragments of blades or flakes typically collected in more recent excavations, may have inadvertently gone unnoticed during these earlier excavation works. Within numerous sites, particularly in mortuary contexts, there are documented occurrences of arrowheads and objects referred to as 'long blades,' 'knife blades,' or 'daggers'. Notably, many of these blades and daggers, crafted from exceptional flint varieties such as those potentially sourced from the Ebro basin in Spain or the Apt-Forcalquier chert in Haut Provence, France, exhibit a substantial size. While most of them are 10 to 20 cm long, some are as much as 35 cm in length (Clop et al., 2001; Palomo and Gibaja, 2003; Terradas et al., 2005; Mangado et al., 2016; Soriano et al., 2022) (Fig. 1).

The implements at mortuary sites are very different from those recorded at settlements or in domestic structures, like silos and waste pits. At the present time, those domestic sites, and the artefacts found in them, are known much better because of excavations performed in recent years (Alonso, 1999; Alonso et al., 2000; Roig et al., 2008; Rosillo et al., 2012; Marín, 2018).

2. Materials and methods

The objects that have been examined and which will act as the points of reference for this study come from collective mortuary sites (megaliths, hypogea and caves) and domestic structures (settlements, silos and waste pits). To be precise, we have studied (Fig. 2):

1. Whole and fragmented blades from the sites of Mas Bousarenys (Santa Cristina d'Aro, Girona), Llobinar (Fitor-Fonteta, Girona), Dolmen de Pericot (Torroella de Montgrí, Girona), Cabana Arqueta (Espolla, Girona), Cementiri dels Moros (Torrent, Girona), Vinya del Rei (Vilajuïga, Girona), Fontanilles (Sant Climent Sescebes, Girona), Les Encantades de Martís (Esponellà, Girona), Balma de la Sargantana (Oliola, Lleida), Cova de la Guineu (Font Rubí, Barcelona), Cova de l'Avi (Vallirana, Barcelona) and Avenc de Sant Antoni (Cunit, Tarragona) (Clop et al., 2001; Gibaja et al., 2009, 2010; Terradas et al., 2005; Mangado et al., 2016).
2. Arrow-heads found in the artificial cave or hypogea of Costa de Can Martorell (Dosrius, Barcelona), in the collective burial in París

Table 2

Total numbers of tools and of active zones (AZ). Working activities and number of active zones for each one of them: BL = Blades, FL = Flakes, PO = Points, AZ = Active Zones; PJ = Projectile; BU = Butchering; BU/H = Butchering or Hide; H = Hide; H/MI = Hide or Mineral; BO/AN = Bone or Antler; CE = Cereals; RV2 = Cereals contact with soil; PL = Plants indet.; CE-RV2 = Cereals or Cereals contact with soil; PL/W = Plants indeterminate or Wood; W = Wood; PL/H = Plants indeterminate or Hide; MI = Mineral; IN = Indeterminate material. Cova de la Guineu, Minferri and Mas d'en Boixos was studied by other authors (Morales et al., 2013; Marín, 2018).

	BL	FL	PO	AZ	PJ	BU	BU/ H	H	H/ MI	BO/ AN	CE	RV2	PL	CE- RV2	PL/ W	W	PL/ H	MI	IN
Mas Bousarenys	7			12				1			2	4	3						2
Llobinar	2			6				2			1	1		2					
Dolmen Pericot	1			4					2			2							
Cabana Arqueta	1			4		2									1				1
Cementiri dels Moros	1			2									2						
Vinya del Rei	12			14		2	2	1			2	5	1					1	
Fontanilles	1			2							2								
Encantades de Martís	3			5							5								
Balma de la Sargantana	16	3	5	29				1			8	2	7	9					2
Cova de la Guineu	7			14	1			1			12								
Cova de l'Avi				1															
Avenc de Sant Antoni	3			5									3	1			1		
Costa de Can Martorell				68		55													
París de Cerdanyola				7	2	2													
Collet del Sàlzer				2															
Vapor Gorina	2	4		6							2	2							2
Mas d'en Boixos	41	###		30		2		3			17	4						3	1
Minferri	###	###		###		10		45		2	23	19	6				19	6	21
Serra Mas Bonet	30	2	3	39	3			1	1		12	4	11	6	1				

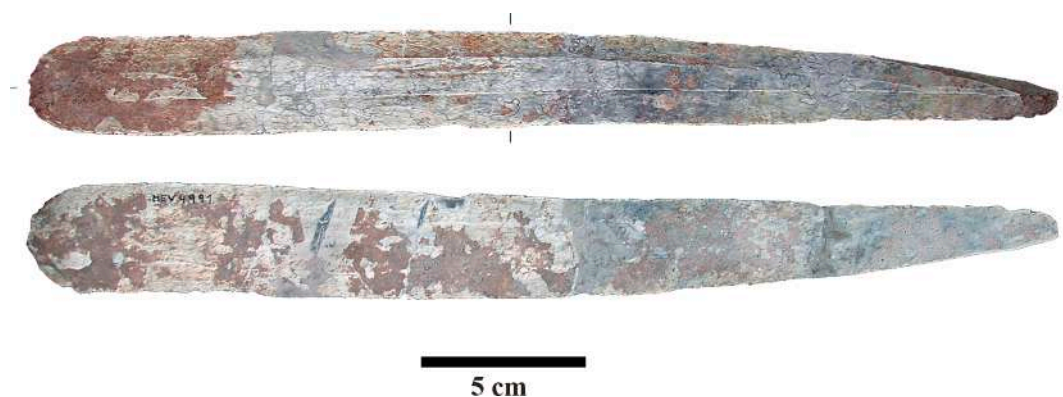


Fig. 1. Example of the long flint blades found in funerary contexts in north-east Iberia. Complete blade from the burial at Serra de l'Arca, deposited in Vic Episcopal Museum.

Street in Cerdanyola (Barcelona), in the megalith of Collet del Sàlzer (Odèn, Lleida) and at Balma de la Sargantana (Oliola, Lleida) (Rovira, 1983; Petit, 2001; Palomo and Gibaja, 2003; Castany et al., 2006.; Gibaja et al., 2006).

3. Various implements found at such domestic sites as: Vapor Gorina (Sabadell, Barcelona), Mas d'en Boixos (Pacs del Penedès, Barcelona), Minferri (Juneda, Lleida), Serra del Mas Bonet (Vilafant, Girona) and Roques del Sarró (Lleida) (Alonso, 1999; Alonso et al., 2000; Roig et al., 2008; Rosillo et al., 2012; Marín, 2018).

These artefacts have been observed with a stereomicroscope with 10x-80x magnification and an Olympus BH2 metallographic microscope with 100x-400x magnification. Beforehand, they were observed with the naked eye to detect residues, assess their state of conservation and note any macroscopic alterations that might have affected the surfaces of the objects and therefore, the preservation of use-wear. Obviously, in all these sites, we have encountered very diverse realities as a consequence of the effects of natural alterations and those produced both by past communities and by archaeologists themselves when they excavated, stored and exhibited them in museums. Some practices in the last century, such as the use of pencils to draw the objects and mark the retouched areas, or the methods and materials used to refit the

fragments of an object, have affected the surfaces of the artefacts and therefore the traces that were generated with their use.

3. The function of chipped lithic implements

This section will concentrate of the use of the blades and arrowheads found in mortuary sites, as they are the most abundant remains. However, some information will also be given about other artefacts found in some of the domestic contexts. This will allow us to determine which types of objects were chosen as grave goods and their differences from the artefacts documented in settlements (Table 2).

3.1. Blades

In the north-east of the Iberian Peninsula, most blades were made from exogenous raw materials and are retouched on both sides, however, it is noteworthy that certain blades were fashioned using locally available flint varieties of lower quality, obtained from neighboring areas such as the Penedès region. The characteristics of the retouch and the degree of invasion of the edge depends on the techniques used and how much they were resharpened, especially in the case of tools used for reaping cereals. In fact, it seems that blades were used initially without

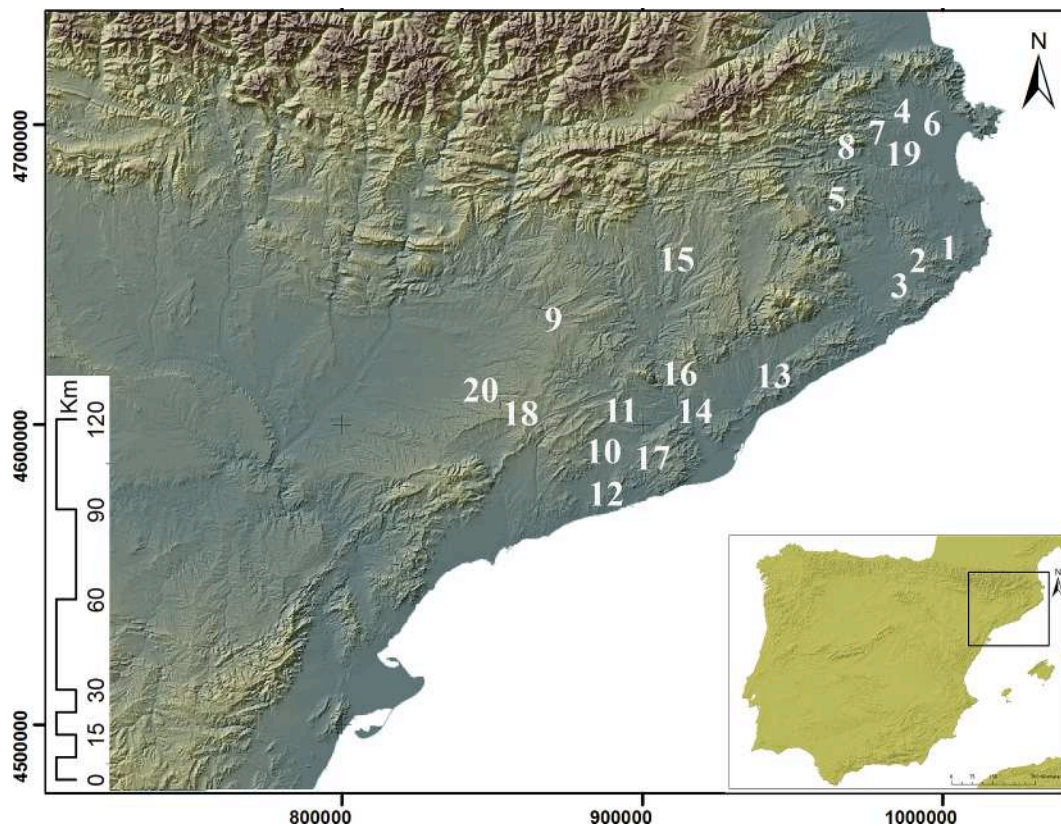


Fig. 2. Location of the sites studied in the text. Funerary Context: 1. Mas Bousarenys, 2. Llobinar, 3. Dolmen de Pericot, 4. Cabana Arqueta, 5. Cementiri dels Moros, 6. Vinya del Rei, 7. Fontanilles, 8. Les Encantades de Martís, 9. Balma de la Sargantana, 10. Cova de la Guineu, 11. Cova de l’Avi, 12. Avenc de Sant Antoni, 13. Costa de Can Martorell, 14. Calle París de Cerdanyola, 15. Collet del Sàlzer, Domestic Context: 16. Vapor Gorina, 17. Mas d’en Boixos, 18. Minferri, 19. Serra del Mas Bonet, 20. Roques del Sarró.

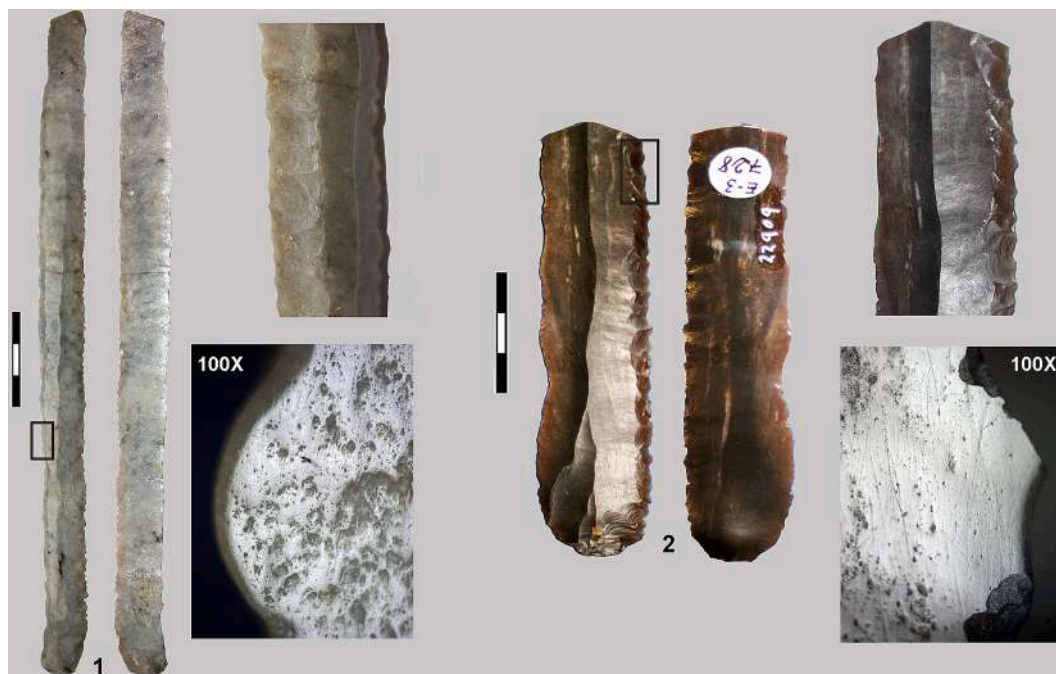


Fig. 3. Blades used for reaping found at La Balma de la Sargantana.

being retouched and, as the edges became rounded, they were resharpenered by simple or denticulate retouching. When they were used intensely and the edge retouched repeatedly, the result was an active

zone with very abrupt retouch that caused the loss of a large part of the cutting edges. Some of the blades from Balma de Sargantana and Mas Bousarenys Dolmen, for example, clearly demonstrate that loss of the



Fig. 4. Blades documented at Avenc de St. Antoni (1) and Cova de la Guineu (2–3). They were used for reaping (1 and 2) and to scrape hide (3) (Mangado et al., 2016).

edge as practically only the central facet of the blades is left (Fig. 3: 1). On some of these blades, the distal parts and occasionally the proximal part were also retouched. The removal of both ends and the reduction of their volume were able to obtain straighter blades. This was probably related to their hafting, as straight edges meant that it was not necessary to alter the groove in the haft with each new piece that was inserted.

Alternatively, some blades were modified by flat covering retouch. This much more careful retouching usually aimed to make a pointed shape, so that the blades look like ‘daggers’. Two of the most representative examples were found in the Dolmen of Cabana Arqueta and Cova de l’Avi (Gibaja et al., 2009; Daura et al., 2015).

Use-wear analysis of this group of blades reveals that most of them were used. The most common uses were related to reaping and the processing of cereals (Figs. 3 and 4). Not all the blades used to cut cereals display the same characteristics. Some blades with well-developed micropolish and few signs of abrasion (striation and pecking) must have been used for many hours, cutting stems in their middle or top. In

contrast, others are badly abraded from reaping near the ground or possibly cutting stems on the ground to chop them into a certain size or remove spikes and roots (Clemente and Gibaja, 1998).

While working with cereals is the task most often identified, in the dolmens of Mas Bousarenys, Llobinar, Cabana Arqueta and Pericot and in the Avenc de Sant Antoni we have occasionally detected blades employed in other activities, such as working with hides, butchery and tasks with an indeterminate substance. These tools had sometimes been reused and are difficult to interpret because the discrimination of different uses depends on factors such as the type of substance worked, the sequence of the working activities performed and the intensity of use. Some pieces are recycled and used for various activities. This is observed in several sickles at different sites as: Mas Bousarenys, Cabana Arqueta, Vinya del Rei or Minferri.

Many of the blades were used on both edges. When the first edge became rounded and lost effectivity, it was resharpened until it was exhausted and then the other edge was brought into use. In this case, the different development of cereal polish inside the scars shows that the blades had been resharpened several times.

Therefore, the reuse of blades in different activities and the utilisation of both edges and their continual resharpening indicate the clear interest in using the full potential of the blades. They were implements with a long life that even acquired symbolic significance when they were left as grave goods. This has also been seen in the long blades found at European funerary sites (Plisson et al., 2002).

It has not always been easy to determine the way in which these long blades were hafted because of the effect of alterations, the degree of development of the traces and the loss of part of the edges through the continual resharpening. Thus, although some of them might have been used without a handle or held with some protective material (for instance, a piece of leather), most of the implements used for reaping display micropolish distributed homogeneously along their edges. This shows that they must have been fixed parallel to the haft of a sickle. This hafting system is interesting, not only because of the way of fixing blades of that size but because at domestic sites in the north-east of the Iberian Peninsula other types of sickles were in use. These were made with small flakes or fragmented blades that were hafted obliquely and of which only one edge was used. Some of these sickles have been documented at such sites as Roques del Sarró, Mas d’en Boixos and Minferri (Alonso, 1999; Alonso et al., 2000; Marín, 2018). Due to the limited number of radiocarbon dates available from funerary contexts, making comparisons between sites becomes challenging. Nevertheless, it can be observed that sites featuring the presence of long blades, such as Cova de la Guineu or Cova de l’Avi, appear to be contemporaneous with domestic contexts (refer to Table 1).

3.2. Arrowheads

Arrowheads are the other characteristic lithic artefact found at mortuary sites. Normally made from various types of flint, they appear in different sizes and shapes. Here we shall consider the arrows found at the sites of Costa de Can Martorell (Dosrius, Barcelona), París Street (Cerdanyola del Vallès, Barcelona), the megalith of Collet del Sàlzer (Odèn, Lleida) and La Balma de la Sargantana.

At Costa de Can Martorell, an artificial hypogeum where some 195–205 burials were documented, the lithic assemblage included 68 arrowheads (Palomo and Gibaja, 2002). Of these, 80% displayed some type of fracture in one or several places, and furthermore 25% were totally unusable. These arrowheads were impossible to repair because of the breakages at their tip and in the barbs and/or tang. It was proposed that at least some of these arrows reached the site lodged in the bodies of the deceased as the consequence of an act of violence. Therefore they cannot be regarded as grave goods (Fig. 5).

A series of 36 burials were documented in the París Street hypogeum. Many of these inhumations were found in Level 12, together with eight arrowheads and abundant beads made from tusk shells (Gibaja et al.,



Fig. 5. Arrowheads from the hypogeum at Can Martorell.

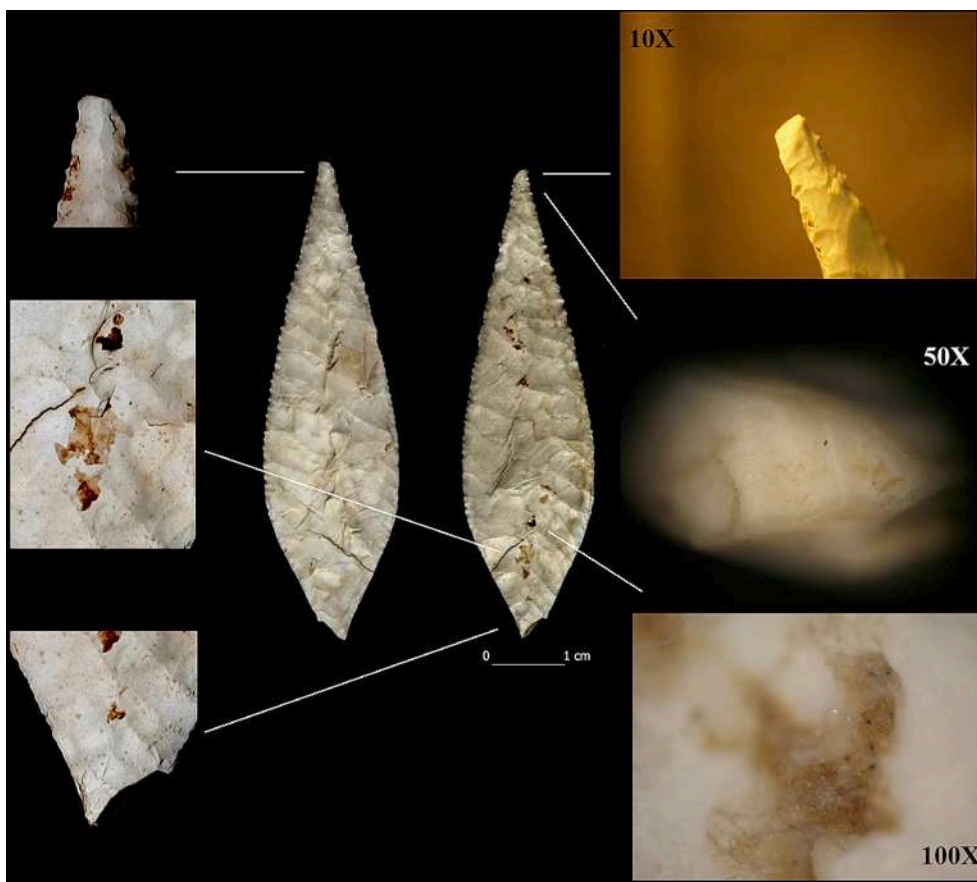


Fig. 6. Arrowhead found in Collet del Sàltzer megalith.

2006). This case is very different from the previous one because only one arrow displayed possible impact fractures in its tip and tang. No macroscopic breakages were seen on the others, and therefore they had probably been left as grave goods while still unused; if they had been used they had not lost effectivity and were in perfect condition.

The Collet del Sàltzer megalith is a structure with a rectangular

chamber formed by three large stones. A few teeth of three children and two excellent arrowheads were found inside it (Castany et al., 2006). Although the arrowheads displayed possible impact fractures in their tips and/or proximal zones, their state of preservation was exceptional and they had most likely been selected to form part of the grave goods (Fig. 6).

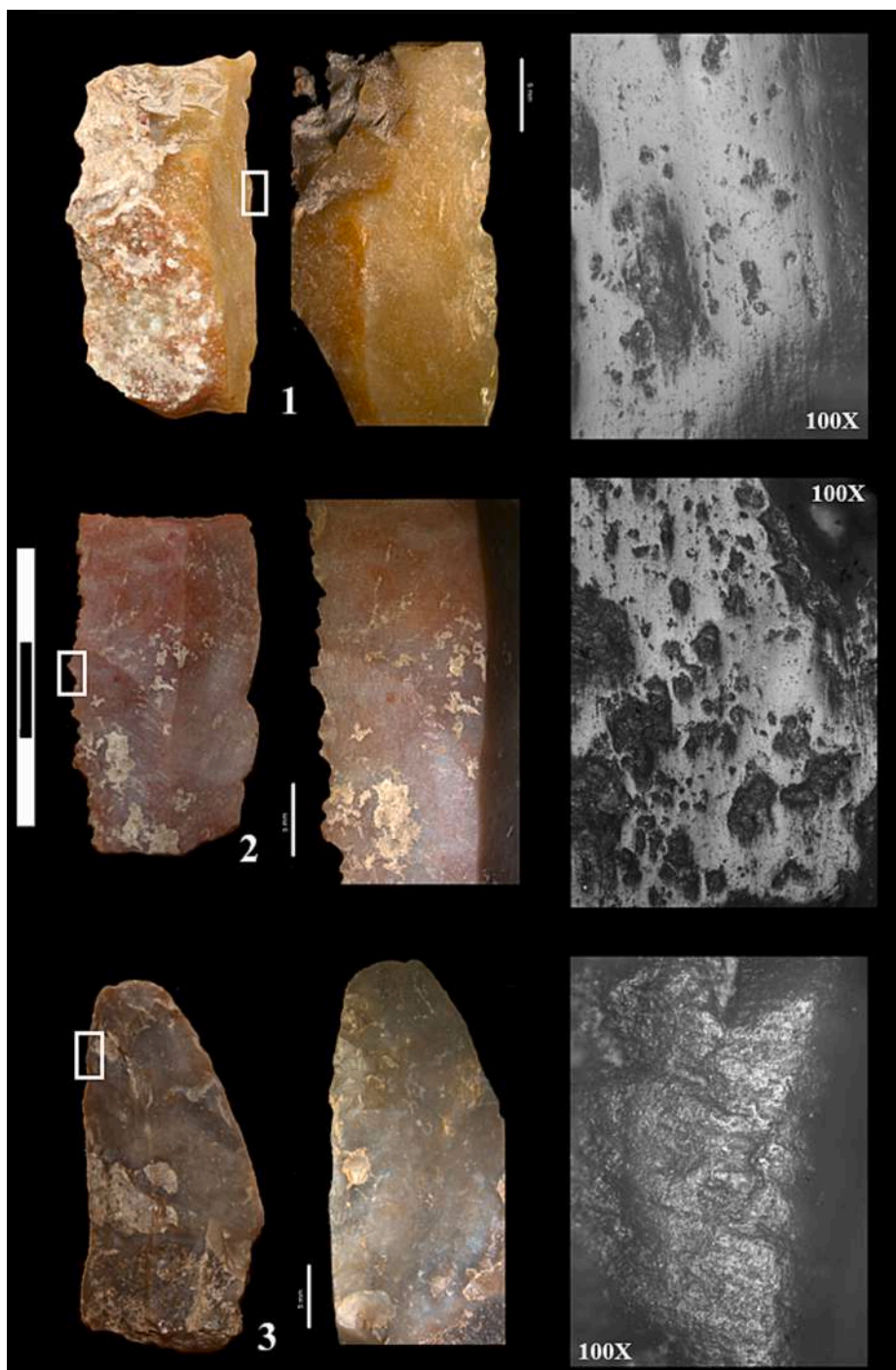


Fig. 7. Implements from Minferri used for reaping (1 and 2) and to scrape a mineral substance (3).

Finally, La Balma de la Sargantana is a small rock-shelter divided into three compartments with stone slabs. Remains of 50 individuals of different age and sex were found, accompanied by six arrowheads none of which displayed clear impact fractures (Petit, 2001). Only small breakages that were not diagnostic were identified in their distal zones. These arrowheads must have been made expressly to be deposited with the deceased or selected from the available arrowheads that were still usable.

3.3. Artefacts found at domestic sites

Studies on chipped lithic implements found in domestic contexts:

settlements, silos and waste pits, are much less common. They are generally quite expedient tools, more often made from flakes than blades, generally using local raw materials. Long blades, which are so characteristic of burial sites, are not only very scarce but appear in the form of small fragments. They are never complete or only slightly broken. However, this section will consider important settlements with large lithic assemblages, like Minferri, Mas d'en Boixos o Serra del Mas Bonet (Alonso, 1999; Rosillo et al., 2012; Marín, 2018), and sites with few structures and archaeological remains, as at Les Roques del Sarró and Vapor Gorina (Alonso et al., 2000; Roig et al., 2008).

It is to be hoped that future traceological studies will examine the implements found in this type of context in order to obtain a full and

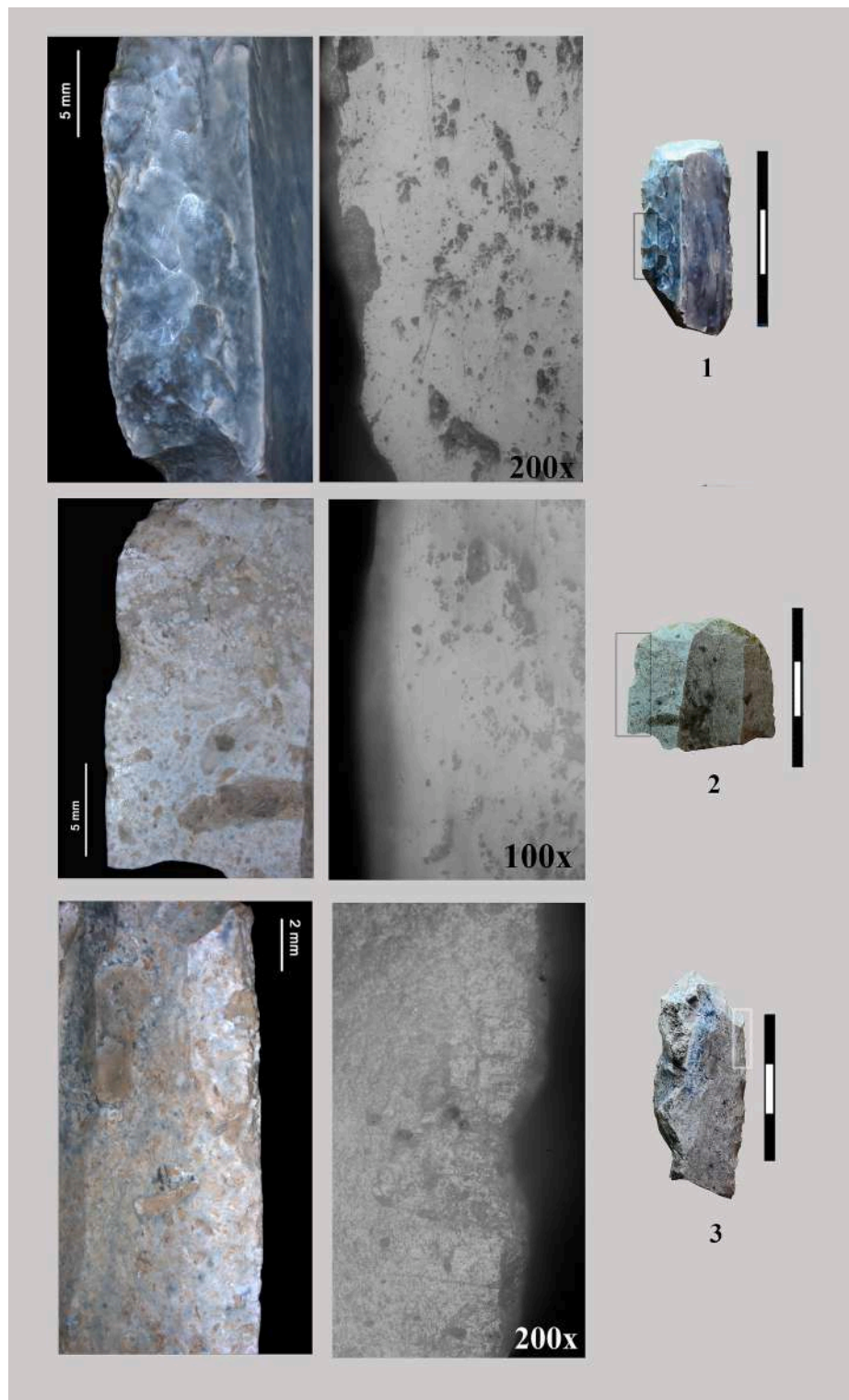


Fig. 8. Fragmented blades from Serra del Mas Bonet used for reaping (1 and 2) and to scrape an abrasive material (hide or mineral) (3).

precise idea of the characteristics of these tools in relation to the tasks in which they were used. Nonetheless, it seems that at most sites, lithic implements were used in such activities as reaping cereals, butchery, hide-working and wood-working.

Thus, many of the blades made from local flint as well as the long blades in exogenous materials were used mostly in sickles for harvesting. These sickles appear to have been broken before their use and used as short elements. This is seen in the tools from the settlements of Minferri,

la Serra del Mas Bonet and Mas d'en Boixos (Figs. 7 and 8).

4. Conclusions

Use-wear analysis of lithic implements from mortuary and domestic sites in the north-east of the Iberian Peninsula have enabled an understanding of the function of the tools found in that region. In the case of the burial sites, the implements consist mainly of long blades and

arrowheads, whereas in the domestic contexts the assemblages are characterised by flakes and a few fragmented blades. It has been observed that:

- Many of the blades selected to be deposited as grave goods were used initially in domestic activities. These were usually blades that were complete or still of considerable size. Most of them had been used for reaping and processing cereals, although other tasks, like cutting meat, hide-working and activities involving minerals, are occasionally identified. This differs from the situation at some mortuary sites in other parts of the Iberian Peninsula, such as Tholos de Montelirio (Sevilla) and Cueva de la Pastora (Valencia), where most of the long blades had not been used. They must have been made intentionally to furnish the burials (García et al., 2014; García et al., 2016).

- The fact that long blades primarily exhibit traces associated with grain harvesting is a highly interesting data. This suggests that cereal harvesting was the main purpose for these long blades, and subsequent uses should be mainly regarded as reutilization. The use of long blades for harvesting grain represents a novelty and innovation compared to the toolkits employed in the Early, Middle, and Late Neolithic periods for the same activity (Gibaja, 2002). In fact, in the preceding millennia, the toolkit for grain collection was dominated by other types of sickles, either of the curved type with serrated edge (such as La Marmotta, Mazzucco et al., 2022), or the “L”-shaped sickles with straight cutting edge (such as La Draga and Costamar, Ibáñez-Estévez et al., 2017; Mazzucco et al., 2020). These and other similar types of composite sickles did not disappear or get entirely replaced by long blades but, in fact, continue to be prevalent in domestic contexts. Therefore, long blades not only represent an element of status or a funerary offering, but also an innovation within the agricultural toolkit. However, their use was likely restricted to certain individuals or groups and did not replace other types of harvesting tools.

- Some blades, and above all many arrowheads, do not display use-wear or only alterations caused by a minor undeterminable action. They are still in perfect condition and therefore at least some of them were made expressly to be left as grave goods. This has also been noted in a recent publication of the funerary remains found in Cova de l'Arbonès (Pradell de la Teixeta, Tarragona) (Soriano et al., 2022).

- The hypogeum of Costa de Can Martorell is a special case because it seems that some of the arrowheads were lodged in the bodies of victims of an act of violence. This circumstance has been detected at other mortuary sites in northern Iberia where, not only many arrowheads were found with impact fractures or broken through the barbs and/or tang, but also some individuals were discovered with arrowheads in their bodies. The most representative cases are the sites of Longar, Aizibita and Charracadía (Navarre) and San Juan Ante Portam Latinam (Álava) (Armendariz and Irigaray, 1995; Beguiristain, 1996; Vegas, 1999; Laborda, 2016).

- The tools found at funerary sites are quite different from the toolkits documented in domestic contexts. In the latter, most artefacts were made from flakes or small blades usually made from local raw materials procured near the settlements. This has been documented at Roques del Sarró, Mas d'en Boixos, Serra del Mas Bonet and Minferri. Fragments of long blades, made from allochthonous flint varieties only appear very occasionally. Naturally, at domestic sites the different types of flint tools were used for an array of tasks, like reaping cereals, butchery, and hide and wood-working (the presence of projectiles is unusual). This diversity of tools made on flakes and blades of varied quality and used for a wide range of activities has recently also been documented at the large settlement of Humanejos in Madrid (López, 2022).

It is therefore clear that, in the case of long blades and arrowheads, these were not exclusively functional artefacts, as in certain circumstances they were imbued with an important symbolic value as funerary offerings. Bearing in mind that they were made with exogenous flint and required demanding technical skills to knap them, it is obvious that they must have been valuable objects for those communities. Nonetheless, many of the blades enjoyed an active ‘life’ before being deposited in the

graves. Indeed, most of the specimens that have been analysed were used in multiple activities linked to the acquisition and processing of different animal and plant matters. Some of them were resharpened so often that they lost their edge and effectiveness.

These large blades and some of the arrowheads were found in dolmens and hypogea that were built with a large investment in time and labour. The scientific community supposes that only a part of population was buried in them because the number of individuals that are documented does not represent the population as a whole. If that is the case, we may assume that those mortuary structures, as well as some caves, were used to inter a few individuals who also were able to access those large blades and arrowheads. Those artefacts made from exogenous flint would have been acquired through the consolidated exchange networks that functioned between different communities. If that hypothesis is correct, then the existence of social differences in those communities must be considered, because all the evidence points to only a few people enjoying the privilege of being buried in complex funerary structures furnished with valuable goods.

In this way, the study of lithic implements deposited as grave goods and those found in domestic sites allows an approach to aspects of economic, social and symbolic organisation at that time. The artefact types possess elements in common with specimens found in many parts of Europe, which increases their interest as they may represent a similar model of behaviour that extended over a wide area during several millennia (Plisson et al., 2002; Guilbeau, 2010; Skakun et al., 2017; Vaquer 2021).

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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