Early Middle Palaeolithic occupations at Ventalaperra cave (Cantabrian Region, Northern Iberian Peninsula)

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Abstract:

The Middle Paleolithic assemblage from Ventalaperra level III, excavated in 1931 by Aranzadi and Barandiarán, was initially interpreted as being Aurignacian, and then as a Late Middle Paleolithic assemblage. Recent excavations at the site undertaken by Ruiz Idarraga and d'Errico have confirmed the Middle Paleolithic attribution, and have additionally produced data on subsistence strategies and environmental conditions. The results obtained from the technological analysis made on level III’s assemblage suggest that its characteristics fit with an Early Middle Paleolithic attribution. The extensive use of local raw materials, the absence of ramified productions, and the use of centripetal (Levallois and Discoid) and SSDA flaking systems, link this assemblage with sites like Arlanpe and Lezetxiki VI which have been dated to the end of the Middle Pleistocene, or nearby sites such as Abrigo Rojo, still under study. This reveals a behavioral pattern for Early Middle Palaeolithic populations in the eastern Cantabrian Region characterized by an extensive use of the landscape, high mobility, short occupations and a high dependence on local resources to assure subsistence and technological provisioning.

Keywords: Late Middle Pleistocene; Early Middle Paleolithic; lithic technology; mobility; Neanderthal; behavior

1. Introduction

Research on Middle Palaeolithic occupations in eastern Cantabria has expanded over the past several years thanks to new excavation projects and revision of classic sites. 25 years ago the Middle Palaeolithic presence in this region, with the exception of Lezetxiki’s levels VI and VII, was restricted to the Upper Pleistocene (Baldeón 1990). The difficulties in applying numeric dating techniques and the insufficient background available for indirect chronological interpretation, spoke in favour of a conservative interpretation of the Middle Palaeolithic chronology in the region. The publication of new sequences with Early Middle Palaeolithic (EMP) occupations, such as that of Arlanpe cave (Rios-Garaizar et al. 2015), and the review of already-known sites such as Lezetxiki (Álvarez Alonso & Arrizabalaga 2012), have shown that human presence in the region by the end of the Middle Pleistocene was greater than previously thought (Montes 2003). Nevertheless the majority of sites in this
region are still related to the later phases of the Middle Palaeolithic, representing a key region to understand Neanderthal extinction (Higham et al. 2014; Rios-Garaizar 2012a).

The lithic assemblage of Ventalaperra cave’s level III, excavated by J. M. Barandiarán and T. Aranzadi in 1931, was initially attributed to the Aurignacian (Barandiarán 1958) and later to the Late Middle Palaeolithic (LMP) (Baldeón 1987; 1990), although no clear evidence sustained these attributions. More recent studies tend to link level III occupations with the Mousterian (Arrizabalaga 1995; 2005). A preliminary study of this assemblage aimed to characterize the eastern Cantabrian LMP in the region, but some elements revealed important differences with these techno-complexes. This study, alongside data published from recent excavations carried out between 2001 and 2004 by Ruiz-Idarraga and d’Errico (2002; 2003; 2004; 2005), will offer elements for discussion on the chronology and cultural attribution of these occupations, and will aim to explain the technological organization strategies implemented by Neanderthal groups occupying the site.

2. Site description

The cave of Ventalaperra (also known as Venta de la Perra or Venta Laperra) is located in a limestone gorge crossed by the Carranza River, a tributary of the Ason River. The landscape surrounding the cave is characterized by many biotopes such as the coastal plains, flat and open valleys, and mountainous areas, very abundant around the cave. From the site it was also easy to access the Ason Valley, which was a major communication axis during the whole of the Palaeolithic, communicating the coastal plains with the Meseta through the Los Tornos mountain pass (918 m a.s.l.). The Carranza Valley also allowed easy communication with the eastern valleys of Agüera and Barbadun through the La Escrita mountain pass (430 m a.s.l.) (Figure 1).

Several sites with Middle Palaeolithic industries are found within the Ason Valley and along this river’s tributaries. In the western part of the Valley, at the cave of Cofresnedo, a single level linked to Mousterian occupations has been identified (Ruiz Cobo & Smith 2003). Further east, El Mirón cave has a single Mousterian level (lv. 130) in the deep sondage excavated in the Vestibule Rear zone, which has been dated to 41,280±1120 uncal. BP (GX-27112). This level, however, yielded very few materials, among them two flaked denticulates (Straus & González Morales 2003). Close to El Mirón one finds the Abrigo Rojo or Abrigo de los Abandejos rock shelter, where a rich lithic and faunal assemblages were recovered on the surface and in a small test trench opened up in 2006 by M.R. González Morales (personal communication with González Morales in 2015). The characteristics of the lithic assemblage recovered at this site, studied by us in 2010, suggest an Early Middle Palaeolithic (EMP) attribution. In the same valley, the Arco A, B and C caves have yielded lithic assemblages attributed to the Middle Palaeolithic. At Arco A the remains of a Middle Palaeolithic layer were discovered during the works of enclosure of the cave (Muñoz Fernández 2005); at Arco B a similar level was also identified. At both sites and in Arco C many lithic materials have been recovered from the surface of the cave, among them several cleavers (González Sáinz & San Miguel Llamosas 2001). Additionally, at Cueva Chiquita some Middle Palaeolithic materials were also recovered on the surface (Muñoz Fernández 2005), but, as is the case for the Arco A-C caves, no clear attribution to the LMP is possible. At Polvorín cave the presence of a possible Middle Palaeolithic occupation and a possible Neanderthal deciduous premolar has been mentioned in recent reports (Ruiz Idarraga & d’Errico 2007).

The Ventalaperra cave mouth (20 x 10 m) opens up on a limestone cliff at 180 m a.s.l. (60 m above the bottom of the valley), facing SW (UTM 30, ETRS89 x:468310 y:4789031 z:168). The entrance chamber, where the archaeological excavations took place and rock art was found, is quite small (15 x 10 m maximum). Following this chamber the cave extends for
a further hundred meters, although no archaeological evidence has been found in the internal galleries.

The rock art was discovered in 1904 by L. Sierra, who also collected some surface materials, including Upper Palaeolithic remains and ceramics (Alcalde del Río et al. 1912: 1-8). In 1931 J.M. Barandiarán and T. Aranzadi excavated the cave. The excavation was carried out on an approximately 6 m² surface, which was originally divided into four sectors (A-D) approximately 1x1.5 m each (Figure 2).

The depth of the materials were recorded and four levels identified: a superficial level (Level I) with recent prehistoric material, including lithics, fauna and ceramics; Level II (between 20-35 cm below the surface), contained bone and lithics, including a backed point fragment; Level III (between 35-45 cm below the surface), with lithics and faunal remains; and finally another level situated around -70 cm with flint and ‘ophite' pieces of a Mousterian aspect (Barandiarán 1958). In a later publication (Barandiarán 1978) this stratigraphy was reinterpreted, and additionally the initial sectors were converted into a normal excavation grid (Figure 2). The materials were grouped into two levels, an initial level with loose earth (between 0 and 22 cm below the surface), which included faunal remains, lithics, a polished stone axe and ceramics, attributed to the end of Neolithic (Barandiarán 1978: 129); and a second level composed of reddish and hardened sediments (between 35-70 cm below the surface) with faunal and lithic remains, attributed to the Aurignacian (Barandiarán 1978: 129). The review carried out by A. Baldeón (1990) identified three different levels (I - Superficial (possibly), II and III) and the lower level was interpreted as being Typical.

Figure 2. Plan of the 1931 excavation. Left: the original published in 1958 (Barandiarán 1958) including the excavated sectors and the position of the decorated panels. Right: the variation published in 1978 (Barandiarán 1978). Below: Synthetic stratigraphy obtained in the recent excavations (modified from Murelaga et al. 2007).
Mousterian containing some blade types closer to the Aurignacian. For this reason, the level was tentatively dated to the Würm III (Baldeón 1990). Recent excavations at Ventalaperra undertaken by R. Ruiz-Idarraga and F. d'Errico, between 2001 and 2004, were conducted beside Barandiarán and Aranzadi’s opened section. The stratigraphy defined by Barandiarán was roughly confirmed by the new data, and more layers below level III (level 4 in the new excavations), all of them sterile, were excavated. The descriptions offered by R. Ruiz-Idarraga and F. d'Errico (2002; 2003; 2004; 2005) together with the stratigraphy represented in a recent paper by Murelaga et al. (2007) reveal a superficial level (1), followed by a dark brown, almost sterile level (level 2). Under level 2 a thick and continuous flowstone was excavated (level 3), and below it a reddish and hardened sediment containing lithics and faunal remains was uncovered (level 4). The archaeological assemblage from level 4 is described as a rich archaeological level with abundant faunal remains and a rich lithic assemblage comprising big flakes, many of them made on microquartzite, which allowed this level to be attributed to the Mousterian. Up to now no date is available for level 4, but the flowstone between levels 2 (Upper Palaeolithic) and 4 (Mousterian) was sampled for U-Th and TL dating (Ruiz Idarraga & d'Errico 2002).

A study of the micromammal assemblage reveals temperate and humid environmental conditions during the formation of level 4, which would have been colder than during level 2’s given the appearance of alpine marmot (Marmota marmota) and tundra vole (Microtus oeconomus) in the older level (Murelaga et al. 2007).

The faunal assemblage is clearly dominated by rocky-environment ungulates such as Spanish ibex (Capra pyrenaica), followed by ungulates typically found on plains or in forests such as red deer (Cervus elaphus) and roe deer (Capreolus capreolus). Among the few carnivores recovered from level 4 the presence of brown bear (Ursus arctos) and wolf (Canis lupus) is noteworthy (Castaños 2005). The faunal assemblage represents a diet based mainly on animals present within the cave’s immediate environment.

3. Material and methods

The lithic assemblage from the first excavations at Ventalaperra comprises 202 artefacts. The excavation of Ventalaperra site was made at the beginning of the 20th century, at this time the excavation procedures were very different from current standards, and very probably the collection could bear some biases. Otherwise, in other excavations made by Barandiaran (i.e. Axlor) we have observed a certain underrepresentation of non-flint materials, which appear in bigger quantities in modern excavations (Rios-Garaizar 2012a: 324-326). This could be also the case of Ventalaperra and the relevance of non-flint raw materials may be underestimated.

The material has been recently classed according to its square of provenance and depth, but we must keep in mind that during the excavation no regular grids were used. This has led to some inconsistencies between the labels and the actual grid. For example, some pieces have been labelled as coming from square 17Y, but such a square does not exist. Also, in the drawings made by Barandiarán for the 1978 publication, some pieces are labelled as 17A or 13Z, but these squares were not excavated. Finally, some of the pieces drawn by Barandiarán and labelled as 5Z in the 1978 publication are actually physically labelled as 15Z. It is likely that during the square-assignation process from the original sectors some mistakes were made; it is also likely that the only kind of reliable information is that of the depth below the original surface. Taking this into account, four major assemblages can be identified: pieces found at c. -22 cm (Level I, N=50); pieces found at c. -35 cm (Level II, N=40); pieces found at c. -50 cm (Level III, N=88); and pieces found at c. -70 cm (Level III, N=20). The present study will focus only on the materials from level III (108 remains).
The raw material has been classified according to the major raw material categories, namely flint, mudstone, quartz and quartzite. Flint varieties have been classified following A. Tarriño (2006) and J. Rissetto’s (2008) flint-type definitions. For some flint types, such as La Cadena flint-type, personal observations have been used (Rios-Garaizar 2004: 85). Mudstone has been defined using information derived from previous observations at other sites such as Arlanpe (Rios-Garaizar 2013) and those made by others (Rissetto 2005). The same is true for quartz and quartzite. Raw materials have been grouped into ultra-local (<1 km), local (<10 km) and non-local (>10 km) varieties. Raw material relevance has been analysed taking into account the total number of artefacts and their weight.

For the technological analysis different variables have been considered. Blanks were classified following a list based on J. M. Geneste's work (Geneste 1988) adapted to the study of eastern Cantabrian Region Middle and Upper Palaeolithic sites (see, for example, Rios-Garaizar 2012a: 23-36; Rios-Garaizar et al. 2011). Different morphometric data were recorded for each piece (dimensions, knapping angles, previous scar direction, cortical surfaces, etc.), and for every retouched edge (dimensions, delineation, angle, type of retouch, etc.). No use-wear analysis was carried out, although morpho-functional inferences have been recorded (position of the potential edges, etc.).

4. Results

Level III has yielded 108 lithic artefacts, most of them flakes, outrepassé flakes and cortical flakes. Other elements such as cores and resharpening flakes are less abundant (Table 1). Formal retouched tools are quite abundant (19.4%), being side-scrapers the most represented tool type (Table 2).

Table 1. Technological composition of Ventalaperra's level III (depth between -45 and -70 cm), Barandiarán and Aranzadi’s collection.

<table>
<thead>
<tr>
<th>Limestone</th>
<th>Quartzite</th>
<th>Quartz</th>
<th>Mudstone</th>
<th>Flint</th>
<th>Urgonian Flint</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
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<tr>
<td>Flake Core</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Cortical Flake</td>
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<td>1</td>
<td>4</td>
<td>3</td>
<td>7</td>
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<td>3</td>
<td>10</td>
<td>7</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Overshot flake</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>Blade</td>
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<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resharpening flake</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bifacial resharpening flake</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Splint</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Fragments and debris &lt;10 mm</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>9</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Used or flaked pebble</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td>Total</td>
<td>1</td>
<td>12</td>
<td>4</td>
<td>15</td>
<td>35</td>
<td>41</td>
</tr>
<tr>
<td>Weight (g)</td>
<td>121.4</td>
<td>93.5</td>
<td>60.3</td>
<td>511.1</td>
<td>156</td>
<td>308.5</td>
</tr>
</tbody>
</table>
Table 2. Typological composition of Ventalaperra’s level III (depth between -45 and -70 cm), Barandiarán and Aranzadi’s collection.

<table>
<thead>
<tr>
<th></th>
<th>Quartzite</th>
<th>Quartz</th>
<th>Urgonian Flint</th>
<th>Flint</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side-scraper</td>
<td></td>
<td></td>
<td>3</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Denticulated side-scraper</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Denticulate</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Retouched flake</td>
<td></td>
<td>1</td>
<td></td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>12</td>
<td>21</td>
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<tr>
<td>% retouched</td>
<td>25</td>
<td>50</td>
<td>9.8</td>
<td>34.3</td>
<td>19.4</td>
</tr>
</tbody>
</table>

Raw material composition in level III (-45 to -70 cm depths) is characterized by a great variability, with local raw materials (<10 km) representing the most abundant kind (Figure 3 and Figure 4).

Among the local raw materials, the Lower Cretaceous 'Urgonian' flint is the most abundant. This flint is nowadays found in the limestones of La Cadena (Carranza), where the cave itself is located (Rios-Garaizar 2004: 85), so it can be considered as ultra-local. This flint is of medium-quality because it presents numerous natural cracks and impurities (Figure 5 E-F), which makes knapping quite unpredictable; nevertheless with this kind of flint it is always possible to obtain suitable fragments with useful edges. The mudstone is a local raw material. This fine-grained and partially-silicified material is good for knapping and produces medium-quality edges. It was obtained as pebbles from secondary deposits in river banks. Lower Cretaceous geological strata bearing mudstone nodules have been cut by the Carranza River 1 km downstream, so this material was probably quite easily accessible. Good- and medium-quality quartzite is present in low quantities in the nearby riverbanks. Also, exploitable quartz beds are present around the site (Rissetto 2005).

Beside these local and ultra-local raw materials, every level produced a variable amount of non-local raw materials, with Upper Cretaceous flint representing the most abundant type.
Two main varieties are present. Flysch flint is nowadays present on the western coast of the Biscay region, 37 km away from Ventalaperra in a NE direction, but it is likely that other closer (20-30 km) outcrops were present between Santoña and Plentzia. This is a high-quality flint characterized by the presence of abundant bioclasts, especially sponge spiculae (Figure 5 A-B). The presence of neo-cortical surfaces with marine abrasion indicates that this flint was picked up from secondary deposits. The other variety is a blue-white coloured translucent flint, with irregular colour zones and abraded neo-cortical surfaces. This flint is characterized by the presence of idiomorphic dolomite rhombs and chalcedony geodes (Figure 5 C-D). The most probable source for this flint variety is the Eocene external marine platform outcrop from Virgen del Mar, near Santander (Tarriño et al. 2015), 50 km away NW. Nevertheless similar flint has been described in Langre (35 km NW) and near Ojo Guareña (25 km S) (Rissetto 2008).

![ Figure 4. Relationship between raw material compositions taking into account number of artefacts and weight. ]

When considering the weight of the transported raw material, the importance of non-Urgonian flint decreases considerably, whereas that of mudstone is far more important (Figure 4). This is also due to the bigger size of the artefacts made on mudstone, including two large cores.

There are also differences in the management of the different raw materials. Fragments of raw Urgonian flint were picked up from the limestone. The morphology of these fragments was roughly parallelepiped, with many natural cracks. This makes it almost impossible to use a production strategy other than an opportunistic one. These natural fragments are shattered and the resultant fragments are sorted, some of them regular enough to define regular edges by retouch or to use as core on flakes to produce small flakes. One small core found at a -70 cm depth had produced a single flake, the same as another core found at -55 or -45 cm depth. Another core is a plaquette from which quadrangular flakes have been obtained through
bipolar percussion. Finally, there is a fragmented core from -55 or -45 cm depth with a cortical surface preserved on one side, a faceted platform and a flat flaking surface which has been centripetally exploited (Figure 6.1). At this same depth, a single pseudo-Levallois point made on good-quality Urgonian flint was also found (Figure 6.2). Only four retouched tools made on this raw material come from this level. One is a denticulated side-scaper (Figure 6.4), two others are side-scaper fragments, and the final one is a Quina-like side-scaper made on the ventral surface (Figure 6.3). Finally, the presence of resharpening flakes also accounts for the occasional transformation of suitable fragments and flakes into side-scrapers. The abundance of trimming flakes, fragments, opportunistic cores and by-products suggests that the Urgonian flint reduction sequence took place entirely at the cave.

![Figure 5. Microscopic and macroscopic textures of different flint types from Ventalaperra’s level III: A-B: Flysch flint; C-D: Translucent flint; E-F: Urgonian flint.](image)
The mudstone assemblage is characterized by the presence of big cortical flakes, flat-convex centripetal cores and the products obtained from these cores. The two cores present two different exploitation surfaces. One is rather flat and shows a recurrent centripetal...
exploitation (Figure 7.1). The other is convex, almost pyramidal in one case, having been used in flake production and platform preparation (Figure 7.2). The direction of the extractions on the flat surface is centripetal, oriented towards the centre of the core, and the obtained flakes are quadrangular (final flakes: 39x36 mm). In both cases, the angle between both surfaces is relatively acute (60-70°). The mudstone flakes can be divided into two groups. One is composed of big, partially-cortical flakes, with flat platforms, asymmetric sections, acute edges showing macro-wear traces and some retouch on the distal part used to facilitate handling (Figure 8.1-3). The other group is composed of non-cortical flakes, with prepared platforms (dihedral and asymmetrically dihedral platforms) and centripetal negatives, which correspond to the production obtained from the aforementioned cores (Figure 8.5-7). A single, wide flake, with a very high detachment angle and angular platform seems to be a by-product of bifacial shaping (Figure 8.4). Unlike the Urgonian flint reduction sequence, the composition of the mudstone assemblage suggests that production took place away from the cave, and that the functional raw products and already-exploitable cores were transported back to the site from a nearby locality.

Figure 7. Mudstone flat-convex centripetal cores. Ventalaperra level III.

The quartzite assemblage is mainly composed of two different varieties, one fine-grained and the other more coarse-grained. The only cortical flake found presents a neocortical eroded surface (Figure 6.5). The majority of the blanks made on this raw material are flakes and fragments of flakes. Two of them have prepared platforms (faceted and dihedral) and the
organization of the previous extractions is centripetal. Two pieces have been transformed into denticulates (Figure 6.6-7), and another into a denticulate side-scraper (Figure 6.5).

Quartz was scarcely used, in the -70 cm depth assemblage there is a small bipolar percussion flake core and a big cortical flake, extracted by bipolar percussion, which also presents some thick retouches (Figure 6.8). In the -45 to -55 cm depth assemblage there are two more flakes, with one cortical flake transformed into a denticulate side-scraper.

The non- Urgonian flint (Flysch and Translucent flint) assemblage has a different composition. The most represented category is that of simple flakes, follow by outrepassé flakes and resharpening flakes. 25% of these flakes are retouched. Most of the outrepassé flakes overtake a cortical flank (Figure 9.1-2, 9.7, 9.9), showing that most of the cores were not entirely prepared, which is, on the other hand, a common characteristic in most Levallois
cores recovered in flint workshops around Kurtzia (see, for example, Rios-Garaizar et al. 2010). Regular flakes and outrepassé flakes usually have flat platforms, but some of them display typical faceted platforms (Figure 9.3, 9.5, 9.6). Previous negatives show that knapping sequences followed a centripetal system. The proportion of retouched tools, mostly side-scrapers, some of them quite thick (Figure 9.1-4), and the presence of resharpening flakes, one of them retouched (Figure 9.10), account for a specific management of non-Urgonian flint tools based on the transport of already-made tools as part of a personal toolkit. Other retouched tools are less invested, showing partially retouched edges (Figure 9.5, 9.9), simple denticulate edges (Figure 9.6), or bifacially-denticulated edges (Figure 9.7, 9.10).

Figure 9. Non-Urgonian flint artefacts. 1-3 déjeté side-scrapers; 4: lateral side-scaper; 5: piece with retouch on ventral surface; 6: denticulate; 7, 10: bifacial denticulates, no. 10 made on a resharpening flake; 8: blade; 9: retouched flake.
Metric comparisons are partially biased by the fact that very small flakes and fragments (<10 mm) were not originally collected by Barandiaran (Figure 10). Despite this, the analysis of the non-broken flaked products shows that the Urgonian and non-Urgonian flint products are very similar, with quadrangular flakes with tight dimensions around 27x24 mm, whereas bigger and slightly elongated products were obtained from mudstone (Table 3, Figure 10).

Table 3. Metric values (L: Length, W: Width, T: Thickness) of different raw materials (U: Urgonian flint; F: Non-Urgonian flint; M: Mudstone; Q: Quartzite).

<table>
<thead>
<tr>
<th></th>
<th>L-U</th>
<th>L-F</th>
<th>L-M</th>
<th>L-Q</th>
<th>W-U</th>
<th>W-F</th>
<th>W-M</th>
<th>W-Q</th>
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<td>11</td>
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<td>7.75</td>
<td>10.76</td>
<td>2.34</td>
<td>2.17</td>
<td>4.28</td>
<td>3.81</td>
<td>1.17</td>
<td>0.78</td>
<td>1.06</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Figure 10. Metric analysis of non-broken flaked products from Ventalaperra’s level III. Abbreviations: U - Urgonian, F - flint, M - mudstone, Q - quartzite.
Considering only the non-Urgonian flint assemblage, there are clear metric differences between the retouched products (N=10, mean: 31x34x10 mm) and the non-retouched ones (N=16; mean: 18.5x23x6 mm), some of them corresponding to resharpening flakes.

5. Discussion

The specific lithic provisioning strategies developed by the Neanderthal groups at Ventalaperra cave give insights about landscape use, the function of the site and the technical development of these groups. The possible biases introduced by the excavation methodology don't modify substantially the obtained results as the only probable effect would be an increase of the non-flint assemblage. The use of ultra-local raw materials in a rather opportunistic way seems to reflect an adaptation to the low quality of the Urgonian flint which, nevertheless, was used to produce some useful tools like raw flakes or side-scrapers. Local raw materials, basically mudstone, are treated differently. Although mudstone was obtained close to the site, the initial phases of the reduction sequence were probably carried out away from the cave, and only some big cortical flakes, cores that were still useful and raw flakes were transported to the cave. Non-local raw materials, especially flint, show that these Neanderthal groups were moving across an extensive territory that roughly occupied all of the coastal plains from Santander to Bilbao (roughly 80 lineal km). The presence of more distant flint has been noted, but further analyses are needed to demonstrate its origin. During these displacements the group were carrying some already-made, curated tools with them, as well as some raw flakes. Given these characteristic we can differentiate, following S. Kuhn's (1995) criteria, an opportunistic provisioning strategy (Urgonian flint), a provisioning place strategy (mudstone) and a provisioning individual strategy (non-local flint). This technology-provisioning system seems to fit well with an ephemeral activity area where some intense activities are carried out by a group which is moving, intermediated after, to another locality.

Technological procedures are dominated by complex flaking systems except for most of the Urgonian-flint production. Non-local flint seems to have been produced following a recurrent centripetal Levallois method with some particularities, basically the maintenance of cortical flanks. Moreover, outrepassé flakes with asymmetric sections and cortical backs seem to have been purposefully selected, alongside regular flakes, to configure the mobile toolkit used by the group in their displacements. Local raw materials, in this case mudstone, was exploited following a recurrent centripetal method with features that are linked to the Levallois (the presence of a flat exploitation surface) and Discoid methods (an acute angle of intersection between both surfaces, convex surface also used for production, not only and specifically for platform preparation, and the relative abundance of asymmetrically dihedral platforms). Beside this exploitation, there are big partially-cortical flakes, with asymmetric sections, unidirectional negatives and flat platforms that seem to be closer to the 'orange slice', SSDA or Quina methods.

This technology provisioning system contrasts with the behaviours observed at eastern Cantabrian Late Middle Palaeolithic assemblages. For example, in Axlor's upper levels (F-B VI-III) tool needs were fulfilled with imported tools and blanks which are especially designed to serve as second-generation cores following a ramified Quina system (Rios-Garaizar 2012a; 2005; Rios-Garaizar et al. 2015). In Axlor's lower levels (N-M, VIII-VII) and at Amalda there is a more intense dependence on local raw materials, mudstone and tobaceous mudstone, which, in both cases, is combined with imported flint and in situ flake production from second generation cores following, in this case, a ramified Levallois system (González Urquijo et al. 2006; Rios-Garaizar 2010; 2012a; Rios-Garaizar et al. 2015). Recent observations made on the Late Middle Palaeolithic assemblages from El Cuco rock shelter suggest a similar technological organization (personal observation by the author). The absence of ramified
productions at Ventalaperra contrasts with these assemblages; also, the use of ultra-local, poor quality, raw materials has not been noted at Axlor or Amalda, except for the production of more massive tools.

When compared to the Early Middle Palaeolithic (EMP) assemblages from Arlanpe cave (Rios-Garaizar 2013; Rios-Garaizar et al. 2015), or the EMP levels at Lezetxiki (Álvarez Alonso & Arrizabalaga 2012) similar characteristics are noted. For example, at both sites a centripetal recurrent production of mudstone flakes is observed. At Arlanpe the use of the SSDA method to produce asymmetric mudstone flakes has also been attested. Finally, at both sites the import of already-made flint flakes, usually retouched and produced by Levallois methods, has been documented, also suggesting a wide exploitation of the landscape, high mobility and short and intense occupations of the caves (Rios-Garaizar et al. 2015). In the EMP levels, as is the case at Ventalaperra, the presence of ramified productions is occasional. In Axlor level R and Morin level 18 ramified production has been described (Lazuén & González-Urquijo 2015) supposedly related to an EMP level, but there is no evidence to sustain a chronology between the Middle and Upper Pleistocene for none of these levels. Axlor level R is attributed to late Middle Pleistocene because its position below level N, which has not been dated. Same can be said for Morin 18, up to now this level has not been directly dated, and the chronological estimation for Morin 17 situates it at Würm II (Baena et al. 2004). Moreover, given the actual description of both assemblages (high percentages of flint use, ramified productions), they are very different from what has been observed in the region’s key EMP sequences (Lezetxiki VI and VII, Arlanpe SQ1-3, Castillo 24-26) (Álvarez-Alonso 2014; Rios-Garaizar et al. 2015), and they fit perfectly with the variability of LMP industries, so there is no chronological nor technological evidence to interpret these assemblages as being EMP.

EMP industries similar to the Eastern Cantabrian sites have been defined at Late Middle Pleistocene sites located at neighbouring regions as the Duero Bassin (Sánchez Yustos & Díez Martín 2015), SW France (Turq et al. 2010) or central Cantabrian Region (Álvarez-Alonso 2014). These assemblages are characterized by the development of non-specialized complex systems of flake production which is the main characteristic of western European EMP (Baena et al. 2014; Moncel et al. 2011; Picin et al. 2013; Turq et al. 2010). Other aspects as the relevance in EMP assemblages of ramified strategies have not been thoroughly explored, but as we have shown at least for the eastern Cantabrian Region there is a clear difference regarding this technological behaviour between EMP and LMP. Same can be said for raw-material provisioning. It has been noted that Neanderthal populations relied mostly on local raw materials (Turq et al. 2013). This is also the case in central and western Cantabrian Region, where lithic provisioning systems relies mostly on local raw materials (Garcia Garriga et al. 2012, Sarabia 1995). But, looking at a closer scale, we also observe a clear difference between EMP and LMP provisioning strategies in the eastern Cantabrian Region (Arrizabalaga 2011; Rios-Garaizar 2012a).

Therefore, it seems that the reliance on local raw materials for in situ productions, the lesser importance of ramified productions and the combined use of Levallois-like technologies with other production strategies, are characteristic of this region’s EMP. This interpretation fits well with the characteristics observed in Ventalaperra’s level III. Additional evidence for such an attribution can be found in the Abrigo Rojo rock shelter, a nearby site most probably dating back to the end of the Middle Pleistocene (González-Morales personal communication), where a similar industry with plan-convex centripetal mudstone cores, intensive use of Urgonian flint, some imported non-local flint flakes and tools and almost no ramified productions has been identified (personal observation by the author). Also the subsistence practices that can be inferred from the faunal assemblage corresponding to level
published by P. Castaños (2005) suggest a high dependence on local resources, especially from rocky-environment ungulates, which, given the location of the cave, were surely very abundant in the surroundings. A similar subsistence strategy has been documented at the Late Middle Pleistocene site of Arlanpe (Arceredillo-Alonso et al. 2013; Rios-Garaizar et al. 2015) and in the Upper Pleistocene site of Amalda (Altuna 1990; Rios-Garaizar 2012b). In Lezetxiki VI and VII’s Middle Pleistocene levels, and in the Upper Pleistocene sites of Axlor and Arrillor, the faunal assemblages show clear selective patterns that are less reliant on local fauna (Rios-Garaizar & García-Moreno 2015).

Similarly, the stratigraphic position of level III (level 4 in the new excavations), under a thick flowstone above which Upper Pleistocene industries are placed, can also provide additional evidence when estimating the chronology of this deposit. Few sites in the Cantabrian record present Middle Palaeolithic occupations below thick flowstones, among them Lezetxiki II, Arlanpe, Covalejos and Castillo, and at all of these the dates obtained from these flowstones are always older than 89,000 BP (Castaños et al. 2011; Rink et al. 1997; Rios-Garaizar et al. 2015; Sanguino & Montes Barquín 2005). Recent work on karst evolution in the eastern Cantabrian Region suggest that major flowstone formation episodes occurred during MIS9, MIS5-6 and the Holocene, being Urtiaga II the only cave with a flowstone dated to MIS4-2 (Aranburu et al. 2015).

Taking into account these data we can quite confidently interpret Ventalaperra level III’s (4) archaeological assemblage as representing short Early Middle Palaeolithic occupations that took place roughly at the end of the Middle Pleistocene. Thus, to the best of our knowledge, there is no evidence to state that this level can be attributed to the Late Middle Palaeolithic, let alone the Aurignacian.

6. Conclusions

Research on human presence during the Late Middle Pleistocene in the eastern Cantabrian Region has significantly advanced in the past several years, thanks to the publication of new sequences such as Arlanpe, and to the review of already-known sites such as Lezetxiki. This specific period is greatly relevant to our understanding of the complex cultural changes that took place between the Lower and Middle Palaeolithic (Monnier 2006; Santonja et al. 2014), and is also important for our understanding of Neanderthal cultural evolution. The review of Ventalaperra level III’s lithic assemblage has provided elements to suggest an Early Middle Palaeolithic attribution and a Late Middle Pleistocene chronology for these occupations. The interpretation of the lithic provisioning system at Ventalaperra reinforces previous interpretations derived from the study of Arlanpe and Lezetxiki’s material. Early Middle Palaeolithic Neanderthal groups used the landscape in a similar way: high mobility and wide territories (>60 km) are inferred from raw material provenance studies and the way in which these non-local raw materials were introduced at the sites. The occupations at these sites are short and rather intense, and the technological needs, which varied from one site to site, were fulfilled using imported tools and local raw materials, and subsistence is based mainly on local resources. This reveals a behavioural pattern for Early Middle Palaeolithic populations in the eastern Cantabrian Region characterized by an extensive use of landscape, high mobility, short occupations and high dependence on local resources to assure subsistence and technological provisioning, which is different to the regional Late Middle Palaeolithic behavioural pattern where more complex provisioning strategies can be observed.
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