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Lithic materials in high fluvial terraces of the central Pyrenean piedmont (Ebro Basin, Spain)



Lourdes Montes ^a, Rafael Domingo ^{a, *}, José Luis Peña-Monné ^b,
María Marta Sampietro-Vattuone ^c, Rafael Rodríguez-Ochoa ^d, Pilar Utrilla ^a

^a Dpto. de Ciencias de la Antigüedad, Universidad de Zaragoza, Spain

^b Dpto. de Geografía y Ordenación del Territorio, Universidad de Zaragoza, Spain

^c Lab. de Gearqueología, Univ Nacional de Tucumán-CONICET, Argentina

^d Dpt. de Medi Ambient i Ciències del Sol, Universitat de Lleida, Spain

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ABSTRACT

Lithic materials from Lower Palaeolithic are scarce in the Ebro Basin. Archaeological surveys carried out in some alluvial terraces on central Pyrenean piedmont have unearthed three new sites with remains of lithic industries related to cobble and core technology and large cutting tools. In the upper terrace levels (T1 and T2) from the Alcanadre and Cinca rivers, some pieces have been recovered on the surfaces: cobble-tools at Las Fitas and bifacial tools at San Quílez. The approximate age of these levels ranges between 780 ka and 1000 ka, established by paleomagnetism and evolutionary stages of calcrete. A cleaver was interbedded into a terrace (T5 level) of a minor tributary of the Cinca River (Olriols), whose age has been established at a regional scale between 178/151 ka. This T5 level is related to one of the cold phases of greater advance of Pyrenean glaciers during MIS 6.

These new findings help us to widen our knowledge of a poorly known period of the human occupation of the middle Iberian basin. The chronological imprecision of most of the lithic materials has been partially overcome by means of geomorphological data, which offers a generic chrono-cultural framework for the people who used them.

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1. Introduction

The Ebro Basin is located in the NE of the Iberian Peninsula. It is a depressed area flanked by the Pyrenees, the Iberian Ranges and the Catalan Coastal Range (Fig. 1). The current climate is continental Mediterranean, with semiarid features and extreme temperatures. The Ebro River drains the basin from NNW to SSE to the Mediterranean Sea, and its most important tributaries come from the Pyrenean ranges.

The discoveries of ancient Palaeolithic tools linked to Quaternary accumulations in the Ebro Basin are infrequent and usually lack stratigraphic context, both isolated finds and more important

lithic assemblages. Far from being exhaustive, we shall note some of the most important references on the topic:

- In the western sector of the Depression stand out the Najerilla valley ensembles (La Rioja), where some important sets of bifacial tools (more than 220 bifaces, trihedral pieces and cleavers) were located (Utrilla, 1985; Utrilla et al., 1986a, 1986b, 1988). There are other minor collections in the surroundings of the Urrúnaga reservoir in the Zadorra basin (Sáenz de Buruaga et al., 1989), as well as in the Pamplona basin (García Gazóla, 1994), the Coscobillo destroyed cave (Barandiarán and Vallespí, 1984), the Urbasa plateau (Barandiarán and Montes, 1992) and the Cidacos terraces (Barandiarán, 1973; Domingo et al., 2000).
- In the central and eastern area, we note some scattered findings in the Jalón valley (Gimeno and Mazo, 1983; Galindo, 1986), in Caspe, next to the Ebro river itself (Mazo and Utrilla, 1992) and several ensembles from Castelló de Plá endorheic depression (Mir and Rovira, 1985), Nerets in the Noguera Pallaresa basin (Rosell et al., 2014), and from the Farfanya and the Femosa

* Corresponding author.

E-mail addresses: lmontes@unizar.es (L. Montes), rdomingo@unizar.es (R. Domingo), jlpena@unizar.es (J.L. Peña-Monné), sampietro@tucbbs.com.ar (M.M. Sampietro-Vattuone), rrodriguez@macs.udl.cat (R. Rodríguez-Ochoa), utrilla@unizar.es (P. Utrilla).



Fig. 1. Location of the study area.

valleys, both in the Segre basin (Mora et al., 1986; Peña-Monné et al., 2005).

In areas bordering the Ebro Basin, there are some noteworthy stratified open air sites, including Torralba and Ambrona in Soria, whose underground drainage goes to the Jalón river (Santonja et al., 2014), Cuesta de la Bajada in Teruel, related to the San Blas terrace cited in the Obermaier's *Hombre Fósil* (1916) (Santonja and Pérez-González, 2014) and several sites in the Catalanian littoral basins, including La Cansaladeta (Vergès and Ollé, 2014), Barranc de la Boella (Vallverdú et al., 2014), Vallparadís (Martínez et al., 2013) and Sant Julià de Ramis and other lithic assemblages in the Ter valley (García et al., 2014; Rodríguez and Sala, 2014). The well-known sites of Atapuerca offer a notable stratified record for almost all the Lower Palaeolithic in the Trinchera cavities: Sima del Elefante, Gran Dolina and Galería (Carbonell et al., 2014).

This article describes some lithic remains found on the higher and middle fluvial terrace levels from the interfluvies Cinca-Alcanadre (Las Fitas) and Cinca-Noguera Ribagorzana (San Quílez and Olriols). Previous studies about geomorphological features of the Quaternary deposits from this region offer a spatial and chronological context for these archaeological materials. The lithic collections from Las Fitas and San Quílez have been located on top of the old terraces, while some materials from Olriols appear imbedded into a terrace level that has an accurate chronological assignment. On the other hand, the central Pyrenean piedmont enjoys one of the best alluvial terraces sequence from Iberia, with relevant chronological information to provide relative ages for lithic materials. Ultimately, this ancient alluvial record provides us a time frame for the first people in this area. A good stratified site from this early period is still to be discovered in the middle Ebro Basin.

2. Methodology

At a regional level, there are some lithic materials from the upper terraces of the Ebro River tributaries, although their exact provenance was dubious. After some recent isolated findings, we have undertaken surveying campaigns in different terrace levels. Experts in archaeology, geomorphology, and soil science have joined their efforts to achieve the most precise contextualization of the recovered lithic materials. We have prepared a synthetic map of the regional Quaternary and detailed transversal sections of the terrace system. Pieces found on top of the Quaternary accumulations (Las Fitas, San Quílez) have been georeferenced; their geomorphological and edaphic contexts have been exhaustively described. For the only tool found in its original stratigraphic

context (Olriols), we drew a detailed profile of the stratigraphic units that form the fluvial accumulation. Taking into account the topographical position of the alluvial levels and its correlation with the established terrace levels for this region, we could link the pieces to their original strata and their contextual chronology. Being aware of the scarcity of our assemblages, their typological features suggest similarities with other Lower/Middle Palaeolithic sites from the region.

3. Quaternary geomorphological and chronological features of the Pyrenean piedmont

The geological bedrock of the Pyrenean central piedmont is composed of continental sediments, mainly sandstones and clays from the Peraltilla Fm (Oligocene) and Sariñena Fm (Miocene) in the limit with the Pyrenean External Sierras (Riba et al., 1983). The Cenozoic bedrock has been deeply incised by the fluvial network during the Quaternary, producing notable accumulations of fluvial sediments caused by the discharge of the Pyrenean rivers, with important sequences of strath terrace levels in stepped disposition. The older levels are now platforms and isolated hills, around 180–190 m above the main fluvial network. At their feet, new cumulative fluvial levels have been formed, occasionally accompanied by lateral pediments.

The main basins of the Pyrenean central section are those of the rivers Gállego, Cinca-Alcanadre and Segre-Noguera Ribagorzana. Lithic materials analysed here are found in the Quaternary formations of the river Cinca and two of its tributaries, the Alcanadre, that forms a wide basin, and the more modest Olriols.

The alluvial accumulations of this central South Pyrenean area have been extensively studied, especially in the domains of geomorphological cartography, terrace system determination, and chronological assignment. Syntheses were published by Mensua and Ibáñez (1977), Bomer (1978), Alberto et al. (1984), Gutiérrez and Peña-Monné (1994), and sub-regional studies focused in the Gállego basin (Benito, 1989), the central piedmont (Rodríguez-Vidal, 1986), the Cinca valley (Sancho, 1991) and the rivers Segre-Noguera Ribagorzana (Peña-Monné, 1983, 1988). These first works organised the information about the evolutionary steps of Quaternary aggradation and degradation and proposed ages around the Pliocene–Quaternary transition for the older levels. This was based on their great height over the current rivers and their disposition as loosely confined watercourses, in the form of wide alluvial fans. Their ultimate assignment to the Quaternary was established in more recent papers, mainly thanks to OSL and paleomagnetic dates.

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