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Bois-de-Riquet (Lézignan-la-Cèbe, Hérault): A late Early Pleistocene archeological occurrence in southern France



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ABSTRACT

The Bois-de-Riquet archeological site (Lézignan-la-Cèbe, Hérault, France) provides significant paleontological and archeological data about the first occupations of Western Europe. Although only partially excavated, the site has already yielded an exceptionally rich paleontological assemblage as well as some stone artefacts. The archeostratigraphical unit "US2" is enclosed within a basalt flowstone radiometrically dated to 1.57 Ma. The sedimentary infill has preserved large and small mammal fossils, as well as coprolites. Biochronological interpretations suggest an age of around 1.3–1.1 Ma for the accumulation. A few basalt artefacts were exhumed alongside the fossil bones. Interpretation of the lithics has required the elaboration of a strict selection protocol based upon extensive knapping experiments with local basalt. This paper presents results from the interdisciplinary study of the Bois-de-Riquet site in the aim of contextualizing these discoveries. The microstratigraphical analysis of the deposits is presented with recent geological interpretations in order to contribute a better understanding of the main features of this assemblage, and its remarkable preservation within the thermal and textural boundary between a basalt flowstone's base and its entablature.

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1. Introduction

In the early 1990s, evidence for the first hominins outside of Africa at the Dmanisi site (Republic of Georgia) revolutionized ideas about early hominin migratory capacities (1.81 ± 0.03 Ma, *Gabunia*

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et al., 2000, 2002; Vekua et al., 2002; Lordkipanidze et al., 2007; Garcia et al., 2010). One of the major repercussions of this discovery was the discussions it sparked about the timing of first occupations of Western Europe. Relatively few Prehistorians advocated the ‘Old’ or ‘Mature’ Europe hypothesis, wherein hominin groups were thought to have successfully colonized Western Europe by at least around 1 Ma (Lumley, 1971; Peretto, 1983; Lumley et al., 1988; Bosinski, 1992; Rolland, 1992; Carbonell et al., 1995; Aguirre, 2000). This hypothesis was notably supported by findings of flake-core industries collected from the high terraces of a number of important river systems (e.g. Bordes, 1961; Howell, 1966; Collina-Girard, 1978; Tavoso, 1978; Segre et al., 1982; Peretto, 1983). Two major difficulties confronted adherents to this hypothesis; firstly, the lack of precise dating of the river terraces and, secondly, the difficulties involved in demonstrating that some of the more non-standardized industries collected from their surfaces were human-made. At the same time, the ‘New Europe’ or ‘Short Chronology’ theory was made popular, suggesting that Western Europe was not successfully colonized by hominins until well into the Middle Pleistocene; around 0.5 Ma (Roebroeks and Van Kolfschoten, 1994). This timing was significant because it corresponded roughly with the proliferation of cave dwellings and also with the earliest European evidence that hominins had mastered the controlled use of fire (James, 1989; Lumley et al., 2013). According to this hypothesis, the more evolved *Homo erectus* (in Europe, *Homo heidelbergensis* Schoetensack, 1908), with their more complex toolkits, were more apt to achieve successful implantation in this area of the globe. Within a matter of only a quarter of a century, such ideas have been overthrown by spectacular discoveries and renewed interest in flake-core assemblages manufactured by our earliest ancestors. Furthermore, modern technological advancements now assure increased reliability in dating the sites, helping to more precisely contextualize new discoveries and also to re-assess information from already known sites (Table 1).

Western Europe to permanent occupation from the end of the Early Pleistocene and into the Middle Pleistocene is at the centre of current debates (Garcia et al., 2011; Rodríguez et al., 2011; MacDonald et al., 2012; Barsky et al., 2013; Bermúdez de Castro and Martín-Torres, 2013). Only sparse hominin fossils in Europe dating to between 1.4 and 0.78 Ma have been unearthed: *Homo antecessor* at Sierra de Atapuerca Gran Dolina level TD6 (Carbonell et al., 1995, 2005; Bermúdez de Castro et al., 1997) and *Homo* sp. at Sierra de Atapuerca Sima del Elefante level TE9 (Carbonell et al., 2008; Bermúdez de Castro et al., 2010, 2011; de Lombera-Hermida et al., 2015) and Barranco León at Orce (Barsky et al., 2010; Toro-Moyano et al., 2010a, 2010b, 2013) (Table 1). Paleoenvironmental reconstructions in the Mediterranean basin for this timeframe suggest a mild, relatively humid climate and patchy landscape (Agustí et al., 2009; Blain et al., 2010, 2011). The first human occurrences in Western Europe are correlated with global climatic changes that influenced the evolution and dispersal of mammalian communities leading to the Villafranchian–Galerian faunal turnover (e.g. Kahlke et al., 2011; Magri and Palombo, 2013). Global site distribution suggests relatively advanced migratory capacities for these first human groups. For example, the evidence from Cromer Forest Beds at Happisburgh 3, above 50° N, confirms that humans had reached Great Britain as early as 0.95–0.7 Ma (Parfitt et al., 2010).

Some sites have yielded a reduced lithic sample (for example, Pirro Nord and Sima del Elefante: Arzarello et al., 2007, 2009; Carbonell et al., 2008; de Lombera-Hermida et al., 2015). Oldowan lithic assemblages are sometimes documented alongside hominin remains: *Homo* sp. in level TE9 of Sima del Elefante (Carbonell et al., 2008; Bermúdez de Castro et al., 2010, 2011; de Lombera-Hermida et al., 2015), Barranco León (Toro et al., 2013) and *Homo antecessor* in Gran Dolina’s level TD6 (Carbonell et al., 1995, 2005; Bermúdez de Castro et al., 1997; Ollé et al., 2013). Other sites have also provided evidence for an early human presence in Europe, by way of bones bearing cut marks ascribed to the use of sharp stone edges and/or

Table 1
Earliest Oldowan archeological sites in Western Europe.

Country	Site name	Age (Ma)	Hominins	References
Ukraine	Korolevo level VII	0.95	–	Koulakovska et al., 2010
Bulgaria	Kozarnika Cave	1.6–1.4	–	Sirakov et al., 2010
Great Britain	Happisburgh	0.95–0.7	–	Parfitt et al., 2010
France	Le Vallonnet	0.984–1.07	–	Lumley et al., 1988; Moullé et al., 2006
	Pont-de-Lavaud	>1	–	Despriée et al., 2006
	Bois-de-Riquet	1.3–1.2	–	Crochet et al., 2009; This paper
Italy	Arce, Colle Marino, Fontana Liri (Latium)	>0.78	–	Biddittu, 1984
	Ca’ Belvedere di Montepoggiolo	1	–	Peretto et al., 1998; Gagnepain et al., 1992; Yokoyama et al., 1992; Falguères, 2003; Arzarello and Peretto, 2010
	Pirro Nord	1.7–1.3	–	Gliozzi et al., 1997; Arzarello et al., 2007, 2009; Arzarello and Peretto, 2010
Spain	Atapuerca, Gran Dolina, TD6	>0.8	<i>Homo antecessor</i>	Berger et al., 2008; Bermúdez de Castro et al., 1997; Carbonell et al., 1995, 2005; Parés and Pérez-González, 1999; Falguères et al., 1999, 2001; Rodríguez et al., 2011
	Vallparadís	1.2–0.6	–	Madurell-Malapeira et al., 2010, 2012; Martínez et al., 2010; Duval et al., 2011a
	Atapuerca, Sima del Elefante TE9	1.2	<i>Homo</i> sp.	Bermúdez de Castro et al., 2010, 2011; Rodríguez et al., 2011; Carbonell et al., 2008
	Barranco León	1.4	<i>Homo</i> sp.	Martínez-Navarro et al., 1997; Oms et al., 2000; Toro-Moyano et al., 2010a, 2010b, 2013
	Fuente Nueva 3	1.3	–	

New data is progressively filling out the gaps separating in both space and time the first Western European hominin occurrences from Dmanisi, and it is now widely accepted that hominin groups were established around the Mediterranean Basin by at least 1.2 Ma (Table 1). Whether or not the earliest implantations gave way in

traces of percussion attributed to stone implements (Díez et al., 1999; Echassoux, 2004; Martínez-Navarro et al., 2010; Sirakov et al., 2010; Filoux, 2011; Garcia et al., 2011; Espigares et al., 2013). The earliest European stone assemblages generally comprise flakes and cores knapped by unidirectional or orthogonal strategies and

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