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Middle Stone Age human occupation and dispersals in the Messak plateau (SW Libya, central Sahara)

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ABSTRACT

Research conducted since the 1990s in SW Libya has provided wide-ranging data on the Pleistocene archaeology of this vast region, which principally relies on surface scatters of lithic artefacts, a series of soundings and two MSA/Aterian dated sites. The Middle Stone Age of the region is thought to date from roughly MIS 6/5 to approximately 60 ka (the latest dated Aterian occurrence). Its distribution varies from sand seas to mountain ranges, with different states of preservation and archaeological visibility. This paper presents data from the last surveys (2010–2011) carried out on 46 transects across the Messak massif. One component of the research strategy was specifically designed to handle the impressive Pleistocene record through sampling a series of spots placed at fixed distances along predetermined survey strips. Field documentation of the techno-typological traits allowed the creation of a territorial data-set used to infer patterns of raw material exploitation, technological variability and the significance of the principal chrono-cultural markers. Quartzarenite, the most available and used raw material, is a diffusely distributed resource. This should have played a role in patterns of land use and mobility and, ultimately, in the composition of archaeological assemblages, mostly characterised by complete reduction sequences. Variability in the application of the Levallois method highlights widespread adoption of recurrent and lineal schemes. Among the latter, point production is extremely rare. The retouched blanks inventory is dominated by scrapers and notches, whereas more specialised tool classes (i.e., tanged pieces, points, foliates) are less common. The dimensions of a small sample of Aterian artefacts provisionally signal a higher degree of homogeneity among pointed tanged specimens than other types. Despite the overwhelming presence of roughly labelled MSA contexts, these show little evidence of a MSA *stricto sensu* chrono-cultural signature, among which scanty but precise elements are comparable with the sub-Saharan and Nile valley early Middle Stone Age, reinforcing the picture of multiple dispersals across the Sahara and North Africa around MIS 6/5. The evolution of MSA occupation and its cultural trajectories is difficult to assess, while the last phases, represented here by the Aterian, can be framed in hyperarid MIS 4 – after the dates from Acacus – and likely represent the adaptation of residual groups almost confined to mountain environments.

1. Introduction

The Sahara is a dynamic geographic entity and its current conformation – in terms of climate, vegetation, fauna, geology, and human groups – is the result of a complex, incessant mechanism of interrelations, mostly dominated by massive environmental changes. Few places in the world are like the Sahara, which offers such a contrast between present – extreme aridity, scarce or no precipitation, low population density – and past conditions. Although this contrast is particularly striking for the Holocene archaeological record (suffice it to mention the savannah fauna represented in rock art), it also applies to earlier periods of human history.

Despite the interest of the scientific community and the media in issues such as the first human peopling of Africa, the succeeding species of hominins, their trajectories of diffusion towards the Mediterranean, and the first appearance and diffusion of *Homo sapiens*, all occurring over a lengthy chronological time span marked by crucial climatic and environmental changes, little is

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known of Pleistocene contexts in the Sahara, even though this covers almost a third of the surface area of the continent. The reasons for this genuine lacuna are most likely due to several factors, including the difficulty of field research in accessing and working in vast deserts, the delicate and often tormented processes whereby the countries' borders were marked during and after protracted colonisation, the high costs of field work, and the overwhelming emphasis on studies of later Holocene prehistoric civilisations.

Copious amounts of lithic artefacts scattered nearly everywhere in the central Sahara are evidence of lengthy frequentations throughout the Pleistocene by different hominins. The understanding of paleoclimate dynamics should be the basis for a better placing of these phenomena, but evidence for the evolution of central Saharan Pleistocene peopling in relation to significant environmental changes is limited. The idea of the Sahara being arid and inhospitable throughout much of the Pleistocene, with humidity pulsations breaking in, has contributed to the widely held belief – or even prejudice – that the Sahara is a barrier. In this respect, the scarce chronological dating of the main Stone Age complexes has meant that climate and environmental aspects are still trapped by decontextualised notions. A partial correction of this approach has been achieved regarding the issue of the diffusion of *H. sapiens*. Isotopic analysis of fluvial and marine sediments, variations in the dominance of C_3 vs. C_4 plants, the reconstruction of changes in lakeside and fluvial areas, studies of soil and lake samples from several areas of the Sahara (i.e., Petit-Maire, 1982; Cremaschi and di Lernia, 1998a; Armitage et al., 2007; Osborne et al., 2008; Castaneda et al., 2009), are but a few of the many areas of research which suggest that considerable climate changes framed late Mid-Late Pleistocene human dispersals through these geographic ranges.

The recognition of humid phases throughout the Pleistocene in North Africa (i.e., Maley, 2010) puts a more dynamic slant on the environmental picture and the related potential for human occupation. It is not by chance that a recent work has introduced the idea of 'the Saharan corridor' (Osborne et al., 2008), an alternative route to the widely known and extensively studied Nile Valley corridor (Van Peer, 1998). Such elements contribute to demolishing the idea of the Sahara as a barrier and suggest instead that it be fully reconsidered as a practicable and instrumental corridor for the circulation and dispersion of MIS5 modern humans from sub-Saharan ranges to North Africa (Drake et al., 2011).

To tackle these issues, specific field and laboratory research methodologies were designed for the study area, rich in Pleistocene findings and located in a crucial zone of the central Sahara, characterised by the presence of major mountain systems surrounded by sand lowlands. Specifically, this paper presents data from the most recent field seasons carried out in the Messak massif. A regional synthesis of the main Mid-Late Pleistocene paleoenvironmental and archaeological data is followed by a focus on the MSA material identified during the 2010–2011 fieldwork. In particular, an attempt is made to recognise gross patterns of technological variability and of raw material procurement and exploitation, along with the identification and contextualisation of some chrono-cultural markers, which help to improve understanding of the MSA frequentation of the Messak and the study region. This paper takes into consideration only Aterian and generalised MSA contexts characterised by the presence of Levallois artefacts and the absence of hand-axes, in order to base the discussion and results on a well defined, although arbitrary, dataset.

2. Regional setting

The research area is located in SW Fezzan (SW Libya), very close to the borders of Algeria and Niger, approximately 900 km from the Mediterranean coast. It is located between approximately 24°–26°N and 10°–13°E. The area consists of a wide range of diversified physiographic features, comprising mountains, sand seas and large fluvial plains (i.e., Wadi Tanezzuft and Wadi Berjuj). The Acacus and the Messak are elongated massifs delimited by abrupt scarps to the west and north-west, respectively (Cremaschi, 1998). The Acacus is mainly composed of sandstone, and its morphology is deeply dissected by a fossil drainage network. It represents the only district with a diffuse presence of caves and rock-shelters, famous for their rock art and associated Holocene archaeology (i.e., Mori, 1965; Cremaschi and di Lernia, 1998a, 1999; di Lernia, 2001; di Lernia and Zampetti, 2008).

Most of the lowlands surrounding the mountainous areas are covered by the dune-fields of the Erg Titersin, to the west, the Erg Uan Kasa, between Acacus and Messak, and the Edeyen of Murzuq, (Fig. 1). The research discussed here is from Messak, which is cut into Cretaceous sandstone and is a relict of a peneplain dissected by dendritic wadis (Zerboni et al., 2011). It is commonly divided by local people into two main units, the Messak Mellet to the south, and the Messak Settafet to the north. The dominant landscape of the plateau is a vast stone pavement systematically stained by black varnish, which also gives the northern massif its name (Settafet = black) (Cremaschi, 1996). Most of the geomorphologic features are fossil, originated in warm pluvial phases of the Neogene, the Pleistocene interglacials, and the Early Holocene. The main physiographic units correspond to residual surfaces (*hamada* and *serir*) punctuated by endorheic depressions, slope deposits and a complex escarpment (Perego et al., 2011).

3. Background

3.1. Late Mid-Late Pleistocene paleoenvironment

In the Central Sahara, wetter environmental conditions are witnessed by the formation of lakes and fluvial systems during interglacial wet phases. Paleoenvironmental research begun by Petit-Maire in SW Libya in the 1980s in the Wadi Shati revealed extensive lake formations in the Middle and Late Pleistocene (Petit-Maire, 1982). Recent research focused on the lacustrine terraces of the Wadi El-Ajal and in the surrounding of Murzuq has highlighted significant environmental variations, thanks to a series of OSL and U/Th dates of sediments associated with the phase of rising groundwater known as the Megafezzan (Armitage et al., 2007; Drake et al., 2008; Geyh and Thiedig, 2008), pointing to humid conditions in the periods >420, 380–290, 260–205, 140–125 ka (MIS 9, MIS 7, MIS 5). A reduction in the intensity of humid episodes throughout the Pleistocene has also been recognised in the lacustrine deposits of the Al Mahruqah Formation (Geyh and Thiedig, 2008), while evidence for episodic brief humid phases has also been recognised during glacial cycles (Brooks et al., 2005).

In the study area, according to the recent reconstruction of Cremaschi and Zerboni (Zerboni et al., 2011; Cancellieri et al., in press), developed paleosols were subject to aridification in the Middle Pleistocene. For example, a dry phase during MIS 7 is signalled by the dating of pedogenic carbonate concretions from a ferralitic paleosol in the Messak (Cremaschi, 1998; Zerboni et al., 2011). Gravel megabars including rolled hand axes and Levallois artefacts inside the Messak wadis (Cremaschi, 1998) indicate enhanced water activity that most likely occurred during MIS 5. In the Acacus, the dates obtained for the Uan Afuda Pleistocene sequence indicate that the earliest dune formation occurred at the end of MIS 5. The dates on the sand above the upper blocks, which released the MSA/Aterian assemblage (di Lernia, 1999a), were 70,000 ± 9500 BP and 73,500 ± 10,000 BP by TL and 69,000 ± 7000 BP by OSL (Cremaschi et al., 1998; Martini et al.,

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