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Acheulean technical behaviors in Aldène cave (Cesseras, Hérault, France)



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ABSTRACT

The cave of Aldène (Cesseras, Hérault, France) is usually known for the preservation of its upper Paleolithic and Mesolithic evidence. However, older occupations are located at the entrance and the collapsed zone of this vast karst network. Unfortunately, companies looking for phosphate had earlier truncated this original filling and only nine Paleolithic stratigraphic outliers (T1 to T9) remained. Repeatedly excavated by the Museum of Prehistoric Anthropology of Monaco, from 1971 until 1998, they mainly registered Acheulean (cf. Tayacian) and Pre-mousterian activities. As interdisciplinary studies and radiometric dating (²³⁰Th/²³⁴U and ESR) were undertaken, it was possible to set up chronostratigraphic and paleoenvironmental contexts, which mostly extend from the end of MIS 13 up to MIS 5.5. The results obtained in the different units also allowed the correlation of remote layers.

Our recent study has focused on technocomplexes with the aim to update the technical behaviors of the Paleolithic knappers that lived along Cesse River, at the entrance of Aldène cave. Petroarchaeology joined to technological and morphofunctional analyses have figured out technical evolution and features, even within the successive lithic Acheulean cultures. The technology and the function of the occupations incited Aldène groups to reorient their economic strategies. They abandoned the available fluvial resources for more siliceous and remote materials (>6 km). Furthermore, percussion and pebble tools associated sometimes with rare bifacial pieces and large flake tools appear to predominate exclusively in the oldest layers (MIS 13–10). In these assemblages, débitage flakes are obtained by Elementary (unipolar or bipolar), SSDA, *semi-tournant* non-laminar and Discoïd (MIS 11) methods. Retouched products consist of scrapers, notched tools and points (Quinson, Tayac, bilateral).

Based on a relative and comparative technological distribution, the first technical transformation emerges in MIS 9. The industries contain more handaxes, rare cleavers and include the premises of the Levallois concept. Thereafter, those technical way and needs will be confirmed (MIS 7–8) with a clear presence of handaxes, increased Levallois products, decrease of percussion and pebble tools, and absence of large flake tools. In layer B, the identification of Levallois blades production and the presence of a Mousterian point reveal the occurrence of Mousterian knappers (MIS 6). The vast archeostratigraphic sequence of Aldène gives us the opportunity to describe the main technical innovations, such as the appearance of Levallois concept throughout the evidence of old structure settlements (fireplaces, slabbed stone pavement).

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1. Introduction

Aldène cave (Cesseras, Hérault, France) is a long karst network extending over four staged levels (Ambert, 1998; Galant and

Holvoët, 2001). This site is usually known for its Aurignacian engravings and for its Mesolithic human footprints (Cathala, 1949, 1953; Breuil, 1952; Glory, 1956; Vialou, 1979; Ambert et al., 2007; Galant et al., 2007) respectively reported in 1927 and 1948 (Guerret, 1927; Cathala, 1949). Nevertheless, older Paleolithic evidence remained at its entrance and in the collapsed hall (Bégouën, 1936). Louis Barral and Suzanne Simone, from the Museum of Prehistoric Anthropology of Monaco, conducted in the cave, with the agreement of the municipality of Cesseras and the invitation of

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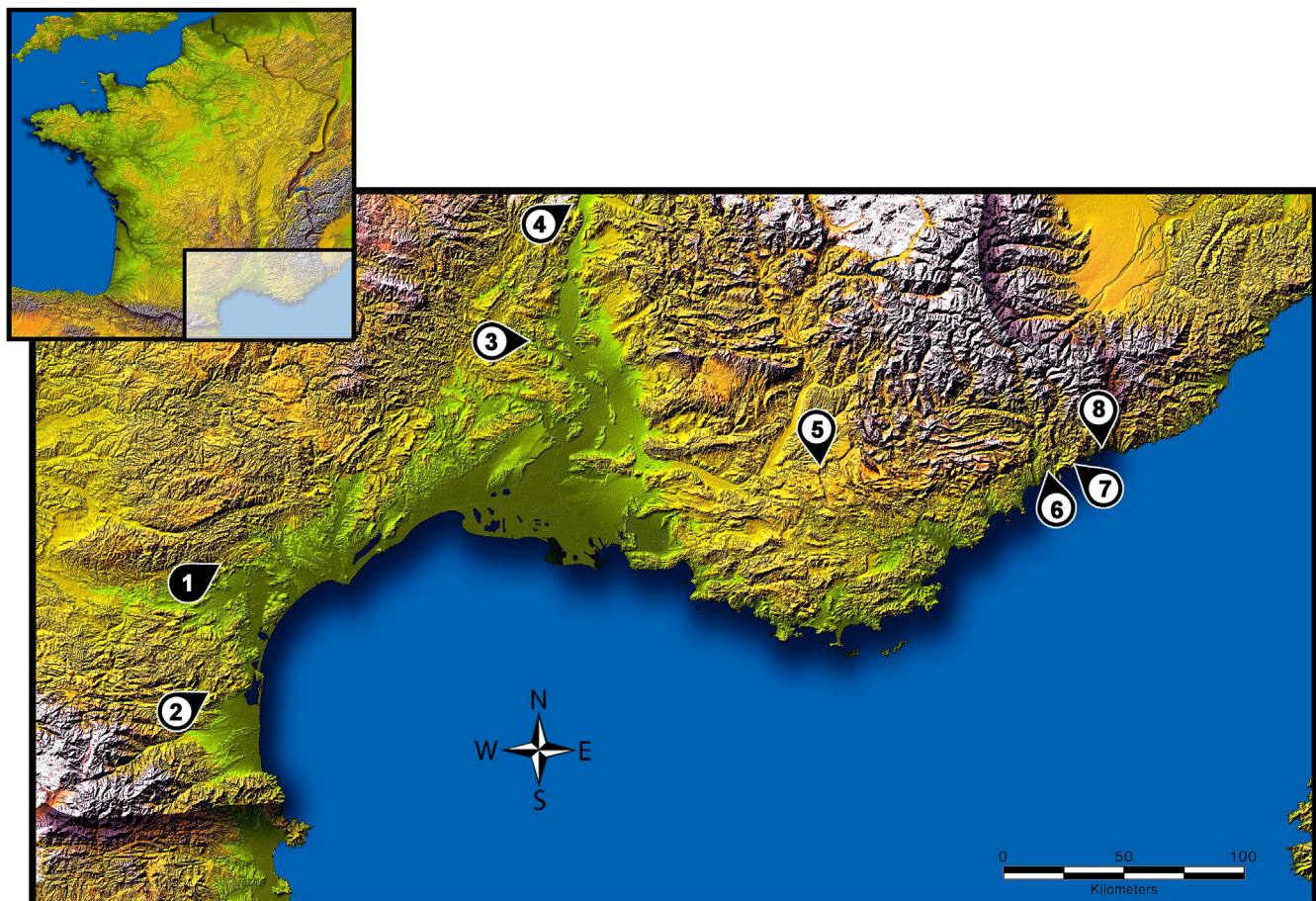
the *Direction des Antiquités du Languedoc-Roussillon*, several excavations between 1971 and 1991 and from 1996 until 1998. Moreover, and despite the intensive industrial work operated between 1888 and 1937 by the Fauzan *Compagnie des guanos-phosphates* (Gauthier, 1894), which largely truncated the original filling, nine stratigraphic outliers (T1 to T9) were unearthed and mainly gave evidence of Acheulean (cf. Tayacian) and Pre-mousterian activities, that extend from MIS 13 to 5e (Barral and Simone, 1972, 1976b; Simone et al., 2002; Simone, 2004). Correlation of the different layers was a huge effort with the complex spatial distribution and the various stratigraphic sequences of the outliers, including gaps, stalagmitic floors, gullying and concretion. Associating systematic analyses throughout sedimentology (Baïssas, 1972, 1975), palynology (Ledru, 1986), paleontology (Bonifay, 1989; Bonifay and Bussière, 1989; Bocherens et al., 1991; Bonifay and Bussière, 1994), microfauna (Chaline, 1973–1974) and numerical dating methods (Hennig, 1982; Simone, 1982; Falguères et al., 1991) by $^{230}\text{Th}/^{234}\text{U}$ and ESR made it possible.

In 2014, a new study aimed to review and specify the economic strategies and the technical objectives of the successive knappers in Aldène. Its long archeostratigraphic sequence from the second half of Middle Pleistocene to the first of Upper Pleistocene affords a rare opportunity to identifying the modifications of technical behaviors of Paleolithic groups through time and within the same territory. Moreover, the location of the cave, against the mountain Noire and

facing the plain of Minervois (Cornet, 1977) and the Mediterranean, is in a corridor of circulation with limited information for the Lower Paleolithic periods. The site allows establishing the link between the plains of the South Roussillon, the Rhône basin, and the incised valleys of Provence. Thus, having characterized and defined the technical behaviors, their breakthroughs and innovations in each technological unit registered in the filling, the data will be compared to the ones of the main sites of southern France along the Mediterranean coast (Fig. 1). They will therefore bring elements of thought and analysis relative to the technical strategies developed by the Old Paleolithic knappers. Are these industries so different according to their raw material, territory and technoeconomic strategies? Are the activities of percussion registered at the basis of the filling and the structuring of space (intentional pavement) isolated cases? Does the Acheulean of Aldène share common mutations with the sites located around the Northern Mediterranean region? What about the domestication of fire, and the apparition of the Levallois concept and its standardization? Are the productions comparable to the eastern assemblages?

2. Regional setting: physical and geological characteristics of Aldène

Aldène, also called Shell or Fauzan cave, is located in the department of Hérault (southern France), in the heart of Minervois



- | | | |
|----------------------|------------------------------------|------------------------------|
| 1 - Aldène | 4 - Payre | 7 - Grotte de l'Observatoire |
| 2 - Caune de l'Arago | 5 - Baume Bonne | 8 - Grotte du Prince |
| 3 - Orgnac 3 | 6 - Terra Amata, Grotte du Lazaret | |

Fig. 1. Location of the main sites mentioned in the text.

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