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Cussac Cave (Dordogne, France): The role of the rock support in the parietal art distribution, technical choices, and intentional and unintentional marks on the cave walls

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A B S T R A C T

In this article, we present the relationships observed between the properties of the rock support in Cussac Cave and the choices made by the Paleolithic artists: the lithology of the limestone and the speleogenesis of the cave resulted in the creation of the vast rock surfaces on which the artists realized monumental engravings. The cartography of the formation processes in the cave and the petrographic analysis of samples collected from the ground show that following a superficial dissolution of the limestone, the rock became softer, thus facilitating engraving, even with a soft tool. The analyses (X-ray Diffraction, X-ray Fluorescence, Raman Spectrometry) indicate a relative concentration of goethite, responsible for the orangish patina visible on the wall surfaces. When engraved, the lighter material under this patina is exposed in the bottom of the incised lines, creating contrasting colors that contribute to the visibility of the depictions. Finally, the alteration of the limestone created a surface that also facilitated the realization of more tenuous marks, such as finger-tracings, as well as involuntary marks made by resting hands.

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1. Introduction

In the early 20th century, researchers began to recognize the phenomena responsible for wall surface alterations in decorated caves, largely thanks to the work of Henri Breuil in Font de Gaume Cave, Dordogne (Capitan et al., 1910). Later, in Pech-Merle (Lot), Amédée Lemozi was also interested in the morphology of the rock support and its relationship to the parietal art works (Lemozi, 1929). But Michel Lorblanchet would be the first to consider the karstic environment and its evolution as fundamental to understanding parietal art, believing that their study was a necessary first step that could provide insights on the distribution of the depictions and the unfinished nature of some of them (Lorblanchet et al., 1973). Lorblanchet (1993, p.70) also considered the support and its alterations to be a determining factor in the technical choices of the artists (he observed this in his work in Australia as well). For him "the techniques used to realize the parietal depictions were adapted to the alterations of the support. The most perfect example of such an adaptation is the finger-tracing technique, which we find in decorated caves containing both Paleolithic decorations and easily accessible surfaces covered with mondmilch (in 17 decorated caves in Europe) (Lorblanchet, 1992)". Philippe Renault, enlisted by Lorblanchet to study the karstology and micromorphology of cave walls, defined the fundamental questions and interpretive reasoning on this subject (Renault, 1987, 1989), which he applied in his study of the caves of Sainte-Eulalie at Espagnac, Pech-Merle both in Quercy (Lorblanchet et al., 1973, 1979), and Niaux, Pyrenees. More recently, in Lascaux Cave, monitoring of the walls through stereo-photography, macro-photography and cartography revealed the complexity of the calcite alteration processes in some of the decorated sectors (Brunet and

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Vouvé, 1996). Finally, we cannot recount the history of this research without mentioning the work of Norbert Aujoulat, especially in Lascaux Cave, who believed that parietal art must be studied through a global approach including the geomorphological context and its evolution (Aujoulat, 2004). This research approach has been developed most recently and most completely in the study of Chauvet-Pont d'Arc Cave, where analyses of the evolution of the support characteristics sheds light on the artists' choices of decorated sectors and artistic techniques, as well as on the taphonomic processes that have modified the parietal depictions (Kervazo et al., 2010; Ferrier et al., 2012).

From the beginning of the archaeological study of Cussac Cave (Dordogne), we have also considered that the relationships between the parietal art works and their rock supports is fundamental; this particularly significant in Cussac Cave since the it is formed within limestone beds with petrographic features and contrasting surface characteristics that offered supports with varying properties to the Paleolithic artists. Our study is therefore

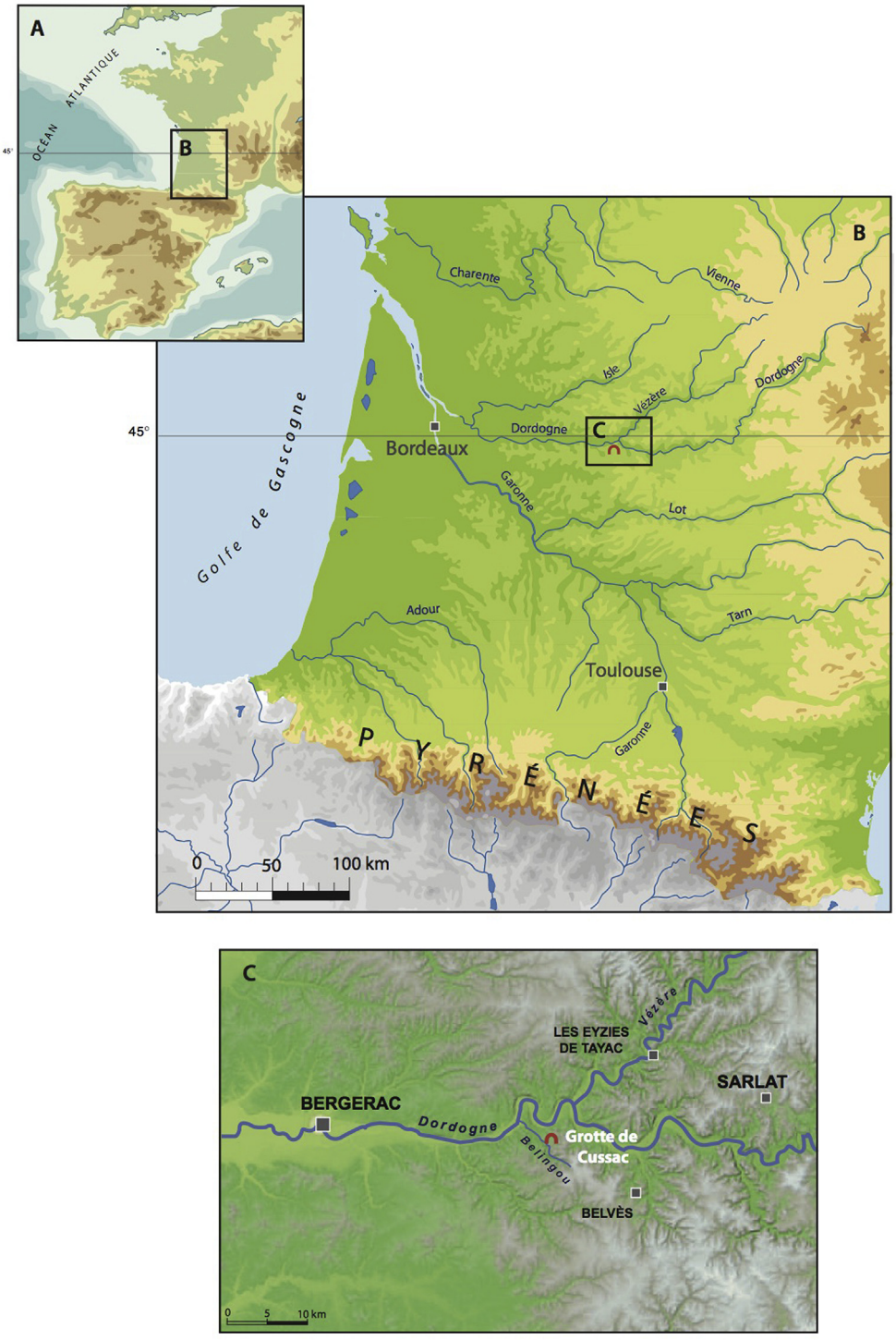

Fig. 1. Location of Cussac cave.