
Vallonnet Cave: an early presence of hominins in Southern Europe

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Résumé

The first "Out of Africa" migrations represent a seminal event in the history of humankind. At the gates of Europe, the first appearance of Hominins is recorded in Georgia, 1.8 million years ago (Ma); however, the picture of migration across the continent remains incomplete. Vallonnet Cave (France) is a Lower Paleolithic prehistoric site with traces of hominin activities including lithic remains and cut-marks on mammal bones. Here, we apply the uranium-lead (U-Pb) methods to two flowstones to date the intervening archaeological levels. The U-Pb data, coupled with paleomagnetic constraints, provide an age range from 1.2 to 1.1 Ma.

The new radiometric U-Pb analyses of the two flowstones (complexes I and IV) combined with paleomagnetism measurements of the deposit infilling provide the first robust chronological framework for the site. The results show the presence of hominin activities in a den for a bivouac at \sim 1.2 Ma, associated with a normal paleomagnetism polarity (Cobb Mountain interval) corresponding to MIS 36, a cold glacial period. This result is consistent with the fact that the archaeological levels (complex III) record a cold climate and is supported by palynological data and faunal taxa. Within the 2s uncertainty on the U-Pb dates (sample PLI-H1), the formation of the Lower flowstone (complex I) and the deposit of the beach (complex II) can be correlated to MIS 37, just before 1.2 Ma during a warm climate.

The results conclusively demonstrate that Vallonnet Cave is one of the oldest European prehistoric sites in France with early hominin occupations associated with an Epivillafranchian fauna. Combined with data from other archaeological sites, the new precise chronology suggests a widespread occupation the Northern Mediterranean to Southwestern Europe at \sim 1.2 Ma.

It thus greatly improves our knowledge of the first dispersals of the *Homo* genus "Out of Africa" during the Early Pleistocene (Calabrian) in this area of Europe. The new chronological framework is contemporaneous with Spanish sites such as La Sima del Elefante (Level TE9c) and with Bois-de-Riquet in France, suggesting a widespread synchronous Hominin activity around the Northern Mediterranean and Southern Europe at \sim 1.2 Ma, followed by a northward colonization at \sim 1.0 Ma. While it remains a challenge to precisely date all archaeological sites with adequate precision, the application of robust radiometric dating techniques to current and future sites will offer further insights and understanding into the routes of Hominin dispersal of Africa in to Europe.

Mots-Clés: Europe, Early occupations, behaviours

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