A multi-proxy research program to evaluate the relationship between Mesolithic occupation patterns and Early Holocene environmental dynamics in the Upper Vinalopó Valley (SE Iberian Peninsula)

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Abstract

Understanding the variable impacts of Early Holocene climatic and environmental changes on Mesolithic communities is often challenged by the paucity of integrated projects analyzing human and climatic systems. In this paper, we present a synthesis of a multi-proxy research program designed to evaluate the relationship between human occupation patterns and Early Holocene environmental dynamics at local scale in the Upper Vinalopó Valley, one of the most arid areas of Iberia. Two open-air Mesolithic sites -Arenal de la Virgen and Casa Corona- placed on aeolian sand deposits have been extensively excavated in the context of the ERC project PALEODEM (Ref.683018). Particularly, the open-air site of Arenal de la Virgen has produced well stratigraphically constrained radiocarbon chronologies of Mesolithic occupations featuring domestic structures and lithic assemblages during the Early to Middle Holocene transition. In addition, a multi-scale research line, including geochronology and high-resolution geoarchaeological techniques, has been developed to (i) study the genesis the formation process of the continental aeolian deposits and its paleoclimatic significance and (ii) analyse the site formation processes of both archaeological sites and structures. Finally, palynological, geochemical and micro-fossil evidence obtained from the investigation of two off-site records -Villena Paleolake and Salines Playa lake- is provided to clarify changes in vegetation cover and the paleohydrological regimen in the area of study. Our results indicate a persistent influence of aridity throughout the Early Holocene in this area with punctuated peaks around the 8.2 kya cal BP affecting vegetation dynamics and lowered hypersaline lake levels. This environmental change is correlated with a significant decrease on the archaeological signal as inferred by the interruption of the Mesolithic occupations at the Arenal de la Virgen site and decline of artefact accumulation rates in Casa Corona.

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