
Ancient genomes from Iberia reveal regional- and local-scale population dynamics of Mesolithic hunter-gatherers

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Abstract

Recent archaeogenetic studies have revealed that Mesolithic hunter-gatherers in the Iberian Peninsula carried two lines of genetic ancestry, suggesting a chronologically and geographically complex process of population admixture. One of these lineages was previously identified in late Pleistocene individuals dated to 19,000-14,000 BP (Spain, France, Belgium, Germany), associated with the Upper Palaeolithic Magdalenian complex in western Europe. The second lineage, which was predominant in western and central Europe, is defined by post-Last Glacial Maximum (LGM) individuals associated with Azilian, Epipaleolithic and Mesolithic contexts in Spain, France, Italy, Switzerland Luxembourg, and Hungary, dated between 14,000 and 7,000 BP. While in Iberia the late Pleistocene lineage survived during the Mesolithic, throughout western and central Europe it became largely unrepresented, as a post-LGM ancestry became dominant and widespread.

In this study, we investigate the hunter-gatherer populations living in Iberia after the Last Glacial Maximum, c. 9100-7300 cal BP during the Early and the Late Mesolithic. We combine newly generated genome sequences with previously published data from Mesolithic Europe to estimate the extent of population admixture, continuity and isolation across time in different subregions of the Iberian Peninsula. To better resolve the chronology of events leading to the survival of both genetic lineages in Mesolithic Iberia, all newly reported individuals were directly dated.

While previous investigations have focused on broad-scale patterns of genetic diversity in

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Iberia, our data density allows an in-depth study of population dynamics at the regional and local-scales. We integrated genetic and stable isotope data with archaeological evidence to explore sociocultural and micro-regional demographic patterns and its effects on broader population dynamics, by examining local genetic relationships. Archaeological evidence of diverse mortuary practices indicates great sociocultural diversity across Iberia during the Mesolithic, and in some cases suggests that hunter-gatherers were strongly rooted to limited territories. Stable isotope data indicates diversity of subsistence practices among neighbouring hunter-gatherer groups, further supporting the population clustering pattern. We investigate how these groups are genetically related by analysing intra- and inter- site kinship, levels of inbreeding and genetic diversity.

Our study provides insight into the role of Iberia as a glacial refugium by further exploring the events that lead to the observed genetic patterns in this region during the Mesolithic. Our approach focuses not only on adding geographical and chronological resolution to supra-regional processes, but also on understanding local-scale dynamics of the last hunter-gatherers in Iberia.

Keywords: Ancient DNA, Stable Isotopes, Mortuary practices, Iberian Peninsula, Early Mesolithic, Late Mesolithic