

Ancient volcanic eruption not a catalyst for early Homo sapiens cultural innovations, researchers say

July 5 2024

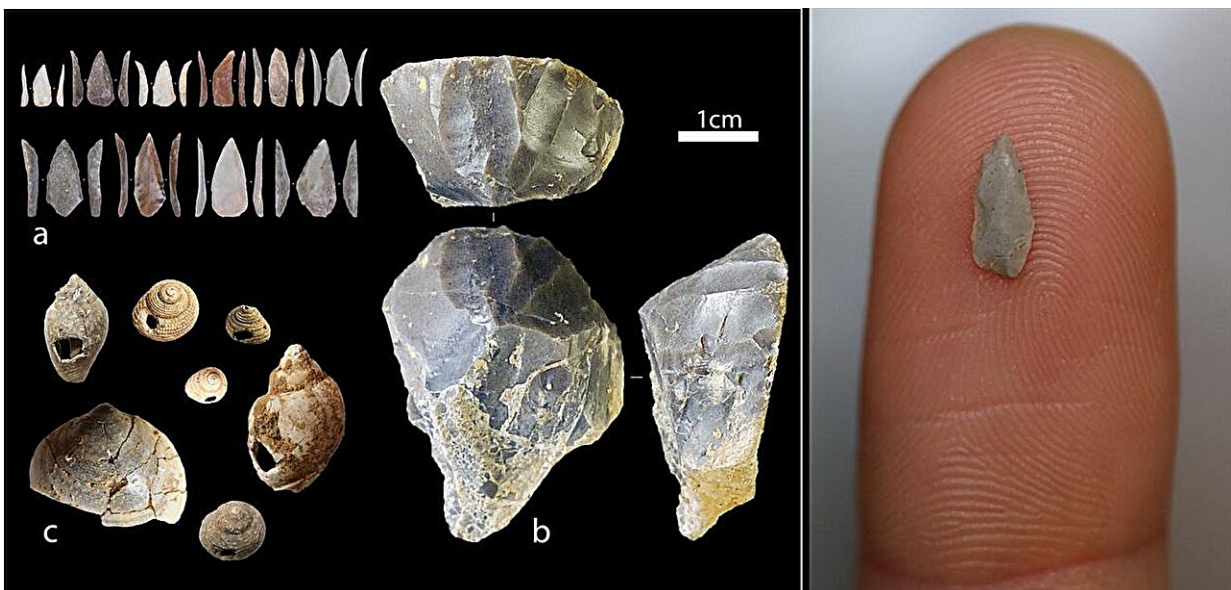


Grotta di Castelcivita. Top: The location of the cave (indicated by a white arrow) at the base of the Alburni massif in the Campania region, southern Italy. Bottom: The excavation trench of the Upper Paleolithic layers. Credit: University of Tübingen

An international team of researchers from the Universities of Tübingen (Dr. Armando Falucchi), Siena, and Bologna analyzed the cultural remains left by groups of early Homo sapiens at Grotta di Castelcivita in southern Italy, dating back to before the major eruption known as the Campanian Ignimbrite.

This explosive event, originating in the still-active Phlegraean Fields about 40,000 years ago, is considered the most powerful volcanic eruption ever recorded in the Mediterranean. Crucially, Grotta di Castelcivita is one of the rare archaeological sites where [volcanic ash](#) has sealed a high-resolution archaeological sequence.

By employing a set of cutting-edge methodologies to meticulously reconstruct the methods used in crafting [stone tools](#)—the most enduring artifacts unearthed in prehistoric excavations—the researchers demonstrated that cultural development at Castelcivita predates both the deposition of the volcanic layers and the sub-contemporaneous cold climate phase known as Heinrich Stadial 4, which lasted for about 2 millennia.



Examples of material culture remains discovered in the uppermost layers of Grotta di Castelcivita, before the definitive sealing of the archaeological sequence by the volcanic eruption. The micro-points (a) were extracted from cores (b) that bear the negatives of these removals. In addition to stone tools, over a hundred marine shells of different species were collected from the Mediterranean shores and perforated for decorative purposes (c). On the right, one of the micro-points is shown on top of a fingertip. Credit: University of Tübingen

The most remarkable cultural innovation recorded at the site is the production of miniaturized stone points from rocks collected near the cave with the most suitable fracture properties. These micro-tools were likely intended to be hafted into multi-component projectile weapons.

This discovery challenges long-held speculations that natural disasters, such as [volcanic eruptions](#) and cooling events, were crucial drivers of major changes in the lifeways of hunter-gatherers throughout human prehistory.

The [study](#), published in *Scientific Reports*, hypothesizes instead that cultural innovations among early Homo sapiens originated from mechanisms of cultural transmission and the establishment of large-scale networks that extended beyond the Alps.

Overall, this research represents a significant step towards understanding how Upper Paleolithic hunter-gatherer societies developed sophisticated strategies to thrive in changing environments.

Grotta di Castelcivita is one of the most important prehistoric deposits in Europe, containing a high-resolution stratigraphic sequence with evidence for the replacement of Neanderthals by early Homo sapiens

groups about 43,000 years ago.

Excavations and [research](#) at this site are conducted with permission from the Italian Ministry of Culture by the Research Unit of Prehistory and Anthropology, Department of Physical Sciences, Earth, and Environment at the University of Siena, under the direction of Adriana Moroni.

More information: Armando Falucci et al, A pre-Campanian Ignimbrite techno-cultural shift in the Aurignacian sequence of Grotta di Castelcivita, southern Italy, *Scientific Reports* (2024). [DOI: 10.1038/s41598-024-59896-6](#)

Provided by University of Tübingen

Citation: Ancient volcanic eruption not a catalyst for early Homo sapiens cultural innovations, researchers say (2024, July 5) retrieved 5 July 2024 from <https://phys.org/news/2024-07-ancient-volcanic-eruption-catalyst-early.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--