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Hemisphere's earliest people lived in Oregon

BY KRISTIN STROMMER
*Museum of Natural and
Culture History*

In 2017, an international team of researchers joined archaeologist Dennis Jenkins at Oregon's Paisley Caves.

Their aim? To re-examine the site's sediment and coprolites, a nice way of saying ancient fecal remains, in hopes of resolving a long-standing debate about when people first arrived in North America.

Results of their study, published last month in "Science Advances," confirm Jenkins' earlier finding that people were living at the site a thousand years before the appearance of the Clovis people, long thought to be the continent's first. That culture was named for the distinctive spear points first discovered near Clovis, N.M.

Paisley Caves is a system of caves in southcentral Oregon. Scientific excavations at the site began in 2002.

Jenkins, a senior archaeologist at the University of Oregon's Museum of Natural and Cultural History, first discovered the coprolites two decades ago. Since then, radiocarbon dating has firmly established their antiquity, with some specimens dating back 14,400 years.

Further examination by University of Copenhagen geneticist Eske Willerslev revealed that the coprolites were human based on the mitochondrial DNA they contain. Still, questions about the coprolites remained, with researchers from Boston to Milan challenging the specimens' human attribution.

"Critics pointed to the fact that DNA can be mobile in sediment," Jenkins said. "So, theoretically, some of the DNA present in the coprolites could have been the result of contamination from



Left: Dennis Jenkins inside Paisley Cave.

Courtesy UO

Below: A BLM archaeologist outside Paisley Five Mile Cave outside the tow of Paisley.

Courtesy BLM

overlying layers."

The new study was a direct response to these questions. It zeroed in on fecal lipids, organic substances such as bile acids and sterols that are far less likely than DNA to move around in sediment and can reliably identify the species of the organism that produced a particular poop.

The study was co-authored by University of Newcastle archaeologists Lisa-Marie Shillito and John Blong along with Jenkins, UO archaeologist Tom Connolly and University of Bristol chemists Helen Whelton and Ian Bull.

The researchers analyzed the lipids found in 21 samples taken from the Paisley Caves coprolites. All 21 had been identified as human through earlier analysis, and all but two had previously been radiocarbon dated. The analysis confirmed that three of six coprolites identified as human by mitochondrial DNA were, in fact, of human origin.

"The study demonstrates that while there probably was some degree of DNA movement from younger human occupations into older sediments, people were indeed living at Paisley Caves as much as 14,200 years ago," Jenkins said.

To further confirm the age of one of the coprolites, the authors also radiocarbon dated a bulrush fiber artifact, likely a fragment of a basket or mat, found in the cave sediment.



"The fragment was dated to roughly 14,000 years before present, giving us a direct radiocarbon age on a pre-Clovis cultural artifact and confirming the stratigraphic integrity of the cave sediment," said Connolly, director of archaeological research at the Museum of Natural and Cultural History and an expert in the fiber artifacts of the northern Great Basin.

Together, the results confirm that the Paisley coprolites are the oldest directly dated human remains in the Western Hemisphere.

The study is an example of how the dialogue of science operates, Connolly said.

"Our understanding is driven forward by skepticism," he said. "When some questioned the attribution of human to the coprolites, DNA studies confirmed the source. When some questioned the accuracy of the DNA findings, scientists pursued novel approaches to confirm them. When multiple studies point to the same result, we gain much greater confidence in our findings."