

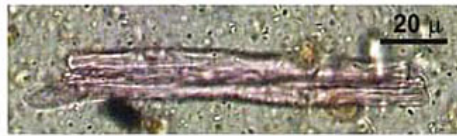
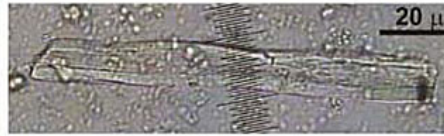
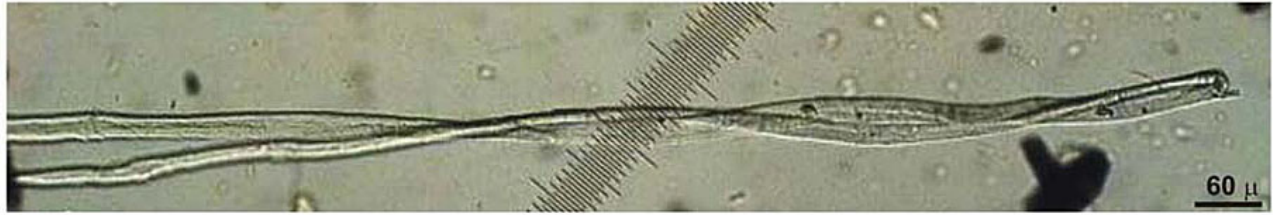
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Oldest-known fibers to be used by humans discovered

Flax fibers could have been used for warmth and mobility; for rope, baskets, or shoes

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Images courtesy of Science/AAAS

A team of archaeologists and paleobiologists has discovered flax fibers in these microscopic soil samples. The flax, which would have been collected from the wild and not farmed, is believed to be more than 34,000 years old, making these fibers the oldest known to have been used by humans.

By Amy Lavoie, FAS Communications

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A team of archaeologists and paleobiologists has discovered flax fibers that are more than 34,000 years old, making them the oldest fibers known to have been used by humans. The fibers, discovered during systematic excavations in a cave in the Republic of Georgia, are described in this week's issue of *Science*.

The flax, which would have been collected from the wild and not farmed, could have been used to make linen and thread, the researchers say. The cloth and thread would then have been used to fashion garments for warmth, sew leather pieces, make cloths, or tie together packs that might have aided the mobility of our ancient ancestors from one camp to another.

The excavation was jointly led by [Ofer Bar-Yosef](#), George Grant MacCurdy and Janet G.B. MacCurdy Professor of Prehistoric Archaeology in the Faculty of Arts and Sciences at Harvard University, with Tengiz Meshveliani from the Georgian State Museum and Anna Belfer-Cohen from Hebrew University. The microscopic research of the soil samples in which numerous flax fibers were discovered was done by Eliso Kvavadze of the Institute of Paleobiology, part of the National Museum of Georgia.

"This was a critical invention for early humans. They might have used this fiber to create parts of clothing, ropes, or baskets — for items that were mainly used for domestic activities," says Bar-Yosef. "We know that this is wild flax that grew in the vicinity of the cave and was exploited intensively or extensively by modern humans."

The items created with these fibers increased early humans' chances of survival and mobility in the harsh conditions of this hilly region. The flax fibers could have been used to sew hides together for clothing and shoes, to create the warmth necessary to endure cold weather. They might have also been used to make packs for carrying essentials, which would have increased and eased mobility, offering a great advantage to a hunter-gatherer society.

Some of the fibers were twisted, indicating they were used to make ropes or strings. Others had been dyed. Early humans used the plants in the area to color the fabric or threads made from the flax.

Today, these fibers are not visible to the eye, because the garments and items sewed together with the flax have long ago disintegrated. Bar-Yosef, Kvavadze, and colleagues discovered the fibers by examining samples of clay retrieved from different layers of the cave under a microscope.

The discovery of such ancient fibers was a surprise to the scientists. Previously, the oldest known were imprints of fibers in small clay objects found in Dolni Vestonice, a famous site in the Czech Republic some 28,000 years old.

The scientists' original goal was to analyze tree pollen samples found inside the cave, part of a study of environmental and temperature fluctuations over the course of thousands of years that would have affected the lives of these early humans. However, while looking for this pollen, Kvavadze, who led the analysis of the pollen, also discovered nonpollen polymorphs — these flax fibers.

Bar-Yosef and his team used radiocarbon dating to date the layers of the cave as they dug the site, revealing the age of the clay samples in which the fibers were found. Flax fibers were also found in the layers that dated to about 21,000 and 13,000 years ago.

Bar-Yosef's team began the excavations of this cave in 1996, and has returned to the site each year to complete this work.

"We were looking to find when the cave was occupied, what was the nature of the occupation by those early hunter-gatherers, where did they go hunting and gathering food, what kind of stone tools they used, what types of bone and antler tools they made and how they used them, whether they made beads and pendants for body decoration, and so on," says Bar-Yosef. "This was a

wonderful surprise, to discover these ancient flax fibers at the end of this excavation project.”

Bar-Yosef and Kvavadze’s co-authors are Belfer-Cohen, Meshveliani, Elizabeth Boaretto of the Weizmann Institute of Science and Bar-Ilan University, Nino Jakeli of the Georgian State Museum, and Zinovi Matskevich of the Department of Anthropology at Harvard.

The research was funded by the [American School of Prehistoric Research at the Peabody Museum](#), Harvard University.

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