Evidence of fire use at ancient campsite in Israel

June 14 2022, by Bob Yirka

Stone tools from Evron Quarry, Israel. Credit: Filipe Natalio and Zane Stepka

A team of researchers affiliated with several institutions in Israel and one in Canada has found evidence of fire use by early hominins (during the Lower Paleolithic) at an ancient camp site in Israel. In their paper

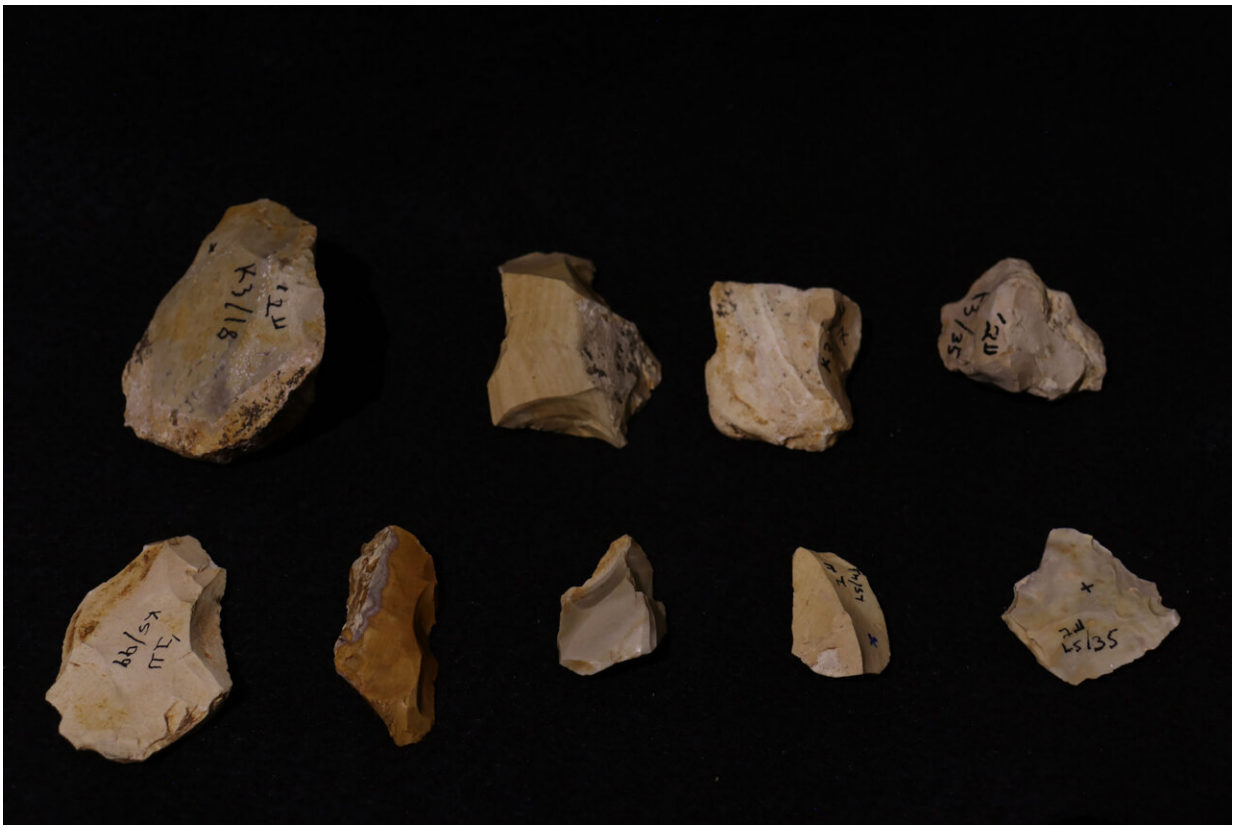
published in *Proceedings of the National Academy of Sciences*, the group describes using an AI application to test for flint tool exposure to temperatures associated with fire.

The general consensus among scientists is that fire use by early humans goes back as far as 1.5 million years and is believed to have been opportunistic—those early humans did not start fires, but took advantage of those that came about naturally due to lightning strikes. It is believed that humans did not learn to start and control fire until approximately 150,000 years ago. In this new effort, the researchers suspected that million-year-old artifacts found at a campsite at Evron Quarry in Israel might have been subjected to fire but they had no direct evidence. To address that problem they turned to artificial intelligence.

The AI app used by the team was based on machine learning—it was taught to recognize fire exposure to flint tools created and used by ancient people. Once it had learned to detect minute traces of fire damage, the researchers used it to test the flint tools found at the site in Israel.

The AI app found that the flint tools had been exposed to temperatures of at least 400 degrees Celsius, strongly suggesting that they had been exposed to fire. Emboldened by the finding, the researchers then used other techniques to test bone fragments also found at the site—they showed the bones had also been exposed to temperatures indicating fire. The researchers suggest the clustering of the tools and bones hints at the possibility that early humans at the site had been controlling the fire they were using.

The researchers conclude by suggesting the AI app could be used to test for fire use at other early human sites.



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More information: Zane Stepka et al, Hidden signatures of early fire at Evron Quarry (1.0 to 0.8 Mya), *Proceedings of the National Academy of Sciences* (2022). DOI: 10.1073/pnas.2123439119