Our ancestors may have left Africa hundreds of thousands of years earlier than thought

By Ann Gibbons Jul. 11, 2018.

More than 2 million years ago, our ancestors were already world travelers, trekking all the way from Africa to Asia, according to stone tools found on a cliff face in north-central China. The age of the tools suggests that the forebears of modern humans left Africa at least 250,000 years earlier than thought; it also supports a minority view that a key human ancestor, *Homo erectus*, may have originated in Asia, not in Africa.

Until now, the oldest evidence of human ancestors outside of Africa was in Dmanisi, Georgia. Here, fossils of short people thought to be early *H. erectus* date back to about 1.85 million years—just after the species appears in Africa. The oldest evidence of early human activity in China and Indonesia has been fossils and stone tools that date to 1.5 million to 1.7 million years ago, including a skullcap of *H. erectus* from a site just 4 kilometers south of the newly dated tools. This trail of stones and bones has suggested that after the earliest members of our own genus *Homo* appeared about 2.8 million years ago in Ethiopia, they didn't leave until 2 million years ago or so—and made it to eastern Asia even later.

Now, evidence from the site of Shangchen, in the Loess Plateau approximately 1200 kilometers southwest of Beijing, is shaking up that view. On the steep cliff faces of a gully at Shangchen, a Chinese team unearthed 96 stone points, flakes, and cores that were probably used to carve up animal bones or to smash them open for marrow. Antelope, deer, and pig bones were found with the tools.

The same team, led by geologist Zhaoyu Zhu of the Guangzhou Institute of Geochemistry at the Chinese Academy of Sciences, spent years nailing down dates for the layers of sediments in which the tools were embedded. The sediments at Shangchen lack volcanic minerals, which provide the gold standard for radiometric dating methods and are plentiful in Africa. Instead, the researchers used paleomagnetic dating—which detects known reversals in Earth's magnetic field that are recorded in ancient rock—and found that the stone tools range in age from 1.6 million to 2.1 million years ago.

This indicates hominins—the family that includes humans and our ancestors—got out of Africa at least a quarter of a million years earlier than thought, and occupied Shangchen on and off for more than 850,000 years, the team reports today in *Nature*.

“The dates are convincing,” says geochronologist Andrew Roberts of the Australian National University in Canberra, who was not part of the team. Geoarchaeologist Reid Ferring of the University of North Texas in Denton, who dated the Dmanisi site, says the paper makes a “good case for occupations older than Dmanisi.”

Another key finding is that the new dates show that “already before 2 million years, hominins were able to cope with a range of environmental conditions,” says archaeologist Wil Roebroeks of Leiden University in the Netherlands, who is not a member of the team. During the long span of occupations at Shangchen, which is about the same latitude as Kabul, the climate fluctuated from warm and wet to cold and dry. “They must have been freezing their buns off,” adds paleoanthropologist Rick Potts of the Smithsonian Institution’s National Museum of Natural History in Washington, D.C.

The early dates suggest hominins were already remarkably adaptable by 2.1 million years ago—even though they had not yet evolved the even bigger brains, long legs, or more advanced tools like hand axes seen in later humans. Although the identity of these early globetrotters is unknown, the new dates raise the possibility that *H. erectus* wasn’t the first hominin to leave Africa. Chinese and Georgian scholars have long argued that a more primitive species of hominin got out of Africa and gave rise to *H. erectus* in Asia. And now, these early tools show hominins were in China far before *H. erectus* appeared in Africa—and early enough for a new species to evolve. In fact, “*H. erectus* may have evolved in Eurasia and migrated to Africa,” Ferring says.

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