

Ancient teeth raise new questions about the origins of modern man

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Teeth found at a site near Rosh Haain in Israel are providing new information about who the earlier occupants of this region were as well as their potential evolutionary relationships with later fossils from this same region, says Binghamton University anthropologist Rolf Quam. Credit: Rolf Quam

Eight small teeth found in a cave near Rosh Haain, central Israel, are raising big questions about the earliest existence of humans and where we may have originated, says Binghamton University anthropologist Rolf Quam. Part of a team of international researchers led by Dr. Israel Hershovitz of Tel Aviv University, Quam and his colleagues have been examining the dental discovery and recently published their joint findings in the *American Journal of Physical Anthropology*.

Excavated at Qesem cave, a pre-historic site that was uncovered in 2000, the size and shape of the teeth are very similar to those of modern man, Homo sapiens, which have been found at other sites in Israel, such as Oafzeh and Skhul - but they're a lot older than any previously discovered remains.

"The Qesem teeth come from a time period between 200,000 - 400,000 years ago when human remains from the Middle East are very scarce," Quam said. "We have numerous remains

of Neandertals and Homo sapiens from more recent times, that is around 60,000 - 150,000 years ago, but fossils from earlier time periods are rare. So these teeth are providing us with some new information about who the earlier occupants of this region were as well as their potential [evolutionary relationships](#) with the later fossils from this same region."

The teeth also present new evidence as to where modern man might have originated. Currently, anthropologists believe that modern humans and Neandertals shared a [common ancestor](#) who lived in Africa over 700,000 years ago. Some of the descendants of this common ancestor migrated to Europe and developed into Neandertals. Another group stayed in Africa and evolved into Homo sapiens, who later migrated out of the continent. If the remains from Qesem can be linked directly to the Homo sapiens species, it could mean that [modern man](#) either originated in what is now Israel or may have migrated from Africa far earlier than is presently accepted.

But according to Quam, the verdict is still out as to what species is represented by these eight teeth, which poses somewhat of a challenge for any kind of positive identification.

"While a few of the teeth come from the same individual, most of them are isolated specimens," Quam said. "We know for sure that we're dealing with six individuals of differing ages. Two of the teeth are actually deciduous or 'milk' teeth, which means that these individuals were young children. But the problem is that all the teeth are separate so it's been really hard to determine which species we're dealing with."

According to Quam, rather than rely on individual features, anthropologists use a combination of characteristics to get an accurate reading on species type. For instance, Neandertal teeth have relatively large incisors and very distinctive molars and premolars whereas Homo sapiens teeth are

smaller with incisors that are straighter along the 'lip' side of the face. Sometimes the differences are subtle but it's these small changes that make having a number of teeth from the same individual that much more important.

But even though Quam and the team of researchers don't know for sure exactly who the teeth belong to, these dental 'records' are still telling them a lot about the past.



Lower premolars and canine teeth found at the Qesem cave site in Israel are raising new questions about the origins of modern man. If linked directly to *Homo sapiens*, it could mean that modern man either originated in what is now Israel or may have migrated from Africa far earlier than is presently accepted, says Binghamton University anthropologist Rolf Quam. Credit: Rolf Quam

"[Teeth](#) are evolutionarily very conservative structures," Quam said. "And so any differences in their features can provide us with all sorts of interesting information about an individual. It can tell us what they ate, what their growth and development patterns looked like as well as what their general health was like during their lifetime. They can also tell us about the evolutionary relationships between species, all of which adds to our knowledge of who we are and where we came from."

Excavation continues at the Qesem site under the direction of Professor Avi Gopher and Dr. Ran Barkai of Tel Aviv University. The archaeological material already recovered includes abundant stone tools and animal remains, all of which are providing researchers with a very informative 'picture' of daily life and hunting practices of the site's former inhabitants.

"This is a very exciting time for archeological discovery," Quam said. "Our hope is that the continuing excavation at the site will result in the discover of more complex remains which would help us pinpoint exactly which species we are dealing with."

Quam continues to be in touch with the on-site archeologists and hopes to collaborate in the project when and if more complete human remains are recovered.

Provided by Binghamton University

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