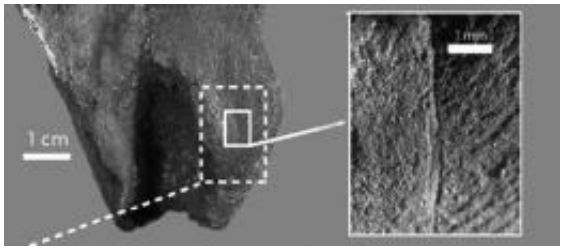
Crocs and fish key to human evolution

1 June 2010



(PhysOrg.com) -- A team of scientists now know what may have helped fuel the evolution of the human brain two million years ago. Archeologists working in Kenya unearthed evidence that our human ancestors ate a wide variety of animals including fish, turtles and even crocodiles. Based on analyses of animal bones and stone tools they excavated, the research team found that our early ancestors incorporated aquatic “brain food” in their diet.

“These aquatic foods are really important sources of the long-chain polyunsaturated fatty acids and docosahexaenoic acid that are so critical to human brain growth,” said co-author and paleoanthropologist Dr. Richmond. “Finding these foods in the diets of our early ancestors suggests they may have helped to lift constraints on brain size and fuel the evolution of a larger brain.”

The discovery of such a diverse animal diet is important because early human brain size increased dramatically after two million years ago. Growing a large brain requires an enormous investment in calories and nutrients and places considerable costs on the mother and developing infant. Anthropologists have long considered meat in the diet as key to the evolution of a larger brain. However, until now, there was no evidence that human ancestors this long ago had incorporated into their diets animal foods, from lakes and rivers, rich in brain nutrients.

A team of scientists from Kenya, the United States, the U.K., Australia and South Africa discovered a 1.95 million year-old site in northwestern Kenya in 2004. Preservation of the excavated site was so remarkable that the team was able to develop a detailed reconstruction of the environment. Over four years, the scientists excavated literally thousands of fossilized bones and stone tools, and were able to determine that at least 10 individual animals, and perhaps many more, were butchered by early humans at this site. Many of these bones showed evidence of cut marks made by early human ancestors as a result of using sharp stone tools to cut meat from the bones or crush long bones to access the fat-rich bone marrow.

“At sites of this age we often consider ourselves lucky if we find any bone associated with stone tools, but here we found everything from small bird bones to hippopotamus leg bones,” said archeologist David Braun of the University of Cape Town in South Africa, who was the lead author on the research.

Gaining access to smaller animals like turtles and fish may have allowed these early humans to increase the protein in their diet without the danger of interacting with dangerous carnivores, such as lions and hyenas. These early humans were relatively small and not well suited to compete with the large carnivores that lived at that time. Stumbling upon brain-fueling food may have been a fortunate side effect of finding foods at lakes and rivers.

The research was funded by the National Science Foundation. The project was directed by Jack Harris of Rutgers University and represents a collaborative effort between National Museums of Kenya and a host of international institutions. Paleontologist Marion Bamford of the University of Witswatersrand in South Africa identified fossilized plant remains that revealed the wet and possibly marshy environment in which these early humans were living. Lead zooarchaeologist Jack McCoy of Rutgers University identified bones of various

animals including turtles, fish, crocodiles and large antelopes that ended up as the meals of these early humans. Dr. Richmond of GW took part in fossil identification and analyzing how the findings were important for human evolution.

The site, known to the archaeologists by the moniker FwJj 20, is located in the northern part of the Koobi Fora research area on the eastern side of Lake Turkana in Marsabit District, Kenya. The presence of overlying layers of volcanic ash helped the team pin down the age of the site. Geologists on the team, Naomi Levin of John Hopkins University and Andrew Herries of the University of New South Wales, Australia, were able to use a combination of techniques to estimate the age of the site as close to 1.95 million years. David Braun and his international team will return to northern Kenya to find more answers to questions about the diets of our earliest ancestors.

The article, “Early hominin diet included diverse terrestrial and aquatic animals 1.95 Ma in East Turkana, Kenya,” will appear in the May 31, 2010, issue of *Proceedings of the National Academy of Sciences* (*PNAS*).

More information: Paper: Braun, D.R., Harris, J.W.K., Levin, N.E., McCoy, J.T., Herries, A.I.R., Bamford, M., Bishop, L., Richmond, B.R., Kibunjia, M., 2010. Early hominin diet included diverse terrestrial and aquatic animals 1.95 Ma ago in East Turkana, Kenya. PNAS.

Provided by George Washington University