Ancient Anthropoid Origins Discovered In Africa

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The fossil teeth and jawbones of two new species of tiny monkey-like creatures that lived 37 million years ago have been sifted from ancient sediments in the Egyptian desert, researchers have reported.

They said their findings firmly establish that the common ancestor of living anthropoids -- including monkeys, apes and humans -- arose in Africa and that the group had already begun branching into many species by that time. Also, they said, one of the creatures appears to have been nocturnal, the first example of a nocturnal early anthropoid.

The researchers published their discovery of the two new species -- named Biretia fayumensis and Biretia megalopsis -- in an article in the October 14, 2005, issue of the journal Science.

The researchers discovered the fossils over the course of the last few years at a site called Birket Qarun Locality 2 (BQ-2) about 60 miles southwest of Cairo in the Fayum desert. BQ-2 has only been systematically excavated for about four years, said Seiffert, in contrast to a much younger Fayum site, called L-41, which has been explored for the last 22 years by Simons and his colleagues.

"BQ-2 and surrounding localities have tremendous potential, which is exciting because they are so much older than other Fayum sites," said Seiffert. "There will certainly be much more information about early anthropoid evolution coming out of BQ-2 over the next few years."

The sediments at BQ-2 lie nearly 750 feet below those of L-41 and were dated at around 37 million years old by measuring telltale variations in magnetic fields in the sediments due to ancient fluctuations in the earth's magnetic fields. According to Simons, other anthropoids exist at BQ-2 and will soon be described,

The latest fossils of the new species consist of tiny teeth and jaws, whose shapes yield critical clues about the species whose mouths they once occupied. For example, a tooth root from the species Biretia megalopsis is truncated, indicating that it had to make room for the larger eyesocket of a nocturnal animal.

"These finds seem to indicate that Biretia megalopsis must have had very large eyes, and so was likely nocturnal," said Seiffert. "This has never been documented in an early anthropoid. The simplest explanation is that Biretia's nocturnality represents an evolutionary reversal from a diurnal ancestor, but that conclusion is based solely on the probable pattern of relationships. If down the road we find out that our phylogeny was wrong, Biretia could end up being very significant for our understanding of the origin of anthropoid activity patterns."

According to Simons, analyses of the teeth of the two species clearly place them as members of a group called parapithecoids, known as "stem" anthropoids because they constitute the species of early creatures from which the subsequent "crown" anthropoid line arose.

"The finding of these parapithecoids from such an ancient time confirms that crown anthropoids -- a group including all modern anthropoids -- have their earliest known beginnings in Africa," said Simons. "They show that findings by other researchers of isolated examples of possible higher primate fossils in Asia do not constitute evidence of an ancestral crown anthropoid lineage there."

According to Seiffert, the latest findings help fill in the gap between later anthropoids and the oldest undisputed anthropoid, called Algeripithecus, found in Algeria, which lived around 45 million years ago. That species had been characterized by only a few teeth, which precluded significant insight into the species, said Seiffert.

Seiffert also noted that previously, the only evidence for anthropoids at 37 million years ago in Africa was a single tooth, attributed to a species called Biretia piveteaui. What's more, the latest discoveries of the two species suggest that a 57-million-year-old African primate called Altiatlasius from Morocco might even be the earliest anthropoid ancestor.

First author on the paper was Erik Seiffert of the University of Oxford and Oxford University Museum of Natural History. Other co-authors were Elwyn Simons and Prithijit Chatrath of Duke University, William Clyde of the University of New Hampshire, James Rossie of Stony Brook University, Yousry Attia of the Egyptian Geological Museum, Thomas Bown of Erathem-Vanir Geological in Boulder, Colo., and Mark Mathison of Iowa State University. The research was supported by the National Science Foundation and the Leakey Foundation. Field work in Egypt was facilitated by the Egyptian Mineral Resources Authority and the Egyptian Geological Museum.