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News

Fossil skull fingered as ape–monkey ancestor

Find in Saudi Arabia sheds light on primate lineage.

Lucas Laursen

The rust-coloured plateau above Mecca in Saudi Arabia may soon attract pilgrims of palaeontology. The hills, which overlook the Red Sea, have disgorged the 29–28-million-year-old partial skull fossil of an early primate that possesses features both of apes and monkeys. The skull could help palaeontologists to answer questions about the life of primates in a period that until now has provided few fossils.

When he caught sight of the skull during an expedition in search of ancient whale fossils last year, Iyad Zalmout wondered whether it belonged to a monkey or an ape. "It turns out it's not an ape, it's not a monkey, it's something intermediate," says Zalmout, a palaeontologist at the University of Michigan in Ann Arbor, and an author of a paper published in *Nature* today¹.

The primate, dubbed *Saadanius hijazensis*, shares characteristics with Propliopithecoida, an ancestor of apes and monkeys which existed more than 30 million years ago, as well as with more recent primates found to have lived from 23 million years ago. *Saadanius* lacks the advanced sinuses of the modern apes and monkeys that are collectively called catarrhines, but has a bony ear tube that was not yet fully developed in the Propliopithecoida.

"This fossil is really key because it has that bony tube," says Erik Seiffert, an anatomist at Stony Brook University in New York. Comparison of the tube and other features, such as the teeth and the position of the eye sockets on the partial skull, with those of other primates could help palaeontologists to reconstruct the branches of the catarrhine family tree, between 30 and about 23 million years ago, says Seiffert.

Monkey puzzle

Zalmout and his colleagues say that *Saadanius* could help assess "competing hypotheses" about how the shape of catarrhine skulls changed over time. One argument, made by palaeontologists who use only fossils as evidence of how unknown intermediate species might have looked, is that catarrhines developed long faces early on. Others examine the shape of living species such



Front and side views of the skull of *Saadanius hijazensis*, an early primate that has ape and monkey characteristics.

Zalmout, Is S. et al, *Nature*

as gibbons, which are rounder-faced, for clues, and conclude that the long faces developed later. "This evidence very clearly supports the palaeontological view," says Seiffert.

Eric Delson, a palaeontologist from the Lehman College of the City University of New York, has written papers supporting later development². He warns that relying entirely on fossils is hazardous: Fossils only reflect part of the diversity of a group of animals. The length of a fossil primate face can also be distorted over time by geological pressure, making it hard to learn the true shape of the species from only a few examples.

However, the analyses that Delson and others³ performed in the 1970s and 1980s, mostly of living catarrhines, took place before the discovery of intermediate fossils such as *Victoriapithecus* and *Saadanius*, which Delson says "will spur a number of people to re-think these things and gives us the only piece of solid data for this time period and phylogenetic position".

Delson, Seiffert and Zalmout all agree that they would like to find more *Saadanius* bones to learn more about the ancient primate, including how it moved around the mangrove environment in which it lived. "It would be interesting to know whether these primates were beginning to come down from the trees, and to know something about what they were eating," says Delson.

The *Saadanius* team has estimated the age of the fossil at 29–28 million years old, on the basis of the known ages of other fossils found nearby. The date correlates roughly with their interpretation of its position in the family tree. Yet it "should still be treated as preliminary", says Seiffert, until follow-up studies using palaeomagnetism can confirm the age of the rocks in which the fossil rested.

Zalmout is confident that preservation of the site by Saudi officials, who want to promote fossil tourism, will enable him to answer these questions and others on his return visits. "In my experience, if you find one primate there should be more there. This will be important to see the whole story about fauna in Arabia and Africa."

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