

Anthropologists say fossil was not 'missing link'

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(PhysOrg.com) -- A fossil that was celebrated last year as a possible "missing link" between humans and early primates is actually a forebearer of modern-day lemurs and lorises, according to two papers by scientists at The University of Texas at Austin, Duke University and the University of Chicago.

In an article now available online in the *Journal of Human Evolution*, four scientists present evidence that the 47-million-year-old *Darwinius masillae* is not a haplorhine primate like humans, apes and monkeys, as the 2009 research claimed.

They also note that the article on *Darwinius* published last year in the journal [PLoS ONE](#) ignores two decades of published research showing that similar fossils are actually strepsirrhines, the primate group that includes lemurs and lorises.

"Many lines of evidence indicate that *Darwinius* has nothing at all to do with human evolution," says Chris Kirk, associate professor of anthropology at The University of Texas at Austin. "Every year, scientists describe new fossils that contribute to our understanding of primate evolution. What's amazing about *Darwinius* is, despite the fact that it's nearly complete, it tells us very little that we didn't already know from fossils of closely related species."

His co-authors are anthropologists Blythe Williams and Richard Kay of Duke and evolutionary biologist Callum Ross of the University of

Chicago. Williams, Kay and Kirk also collaborated on a related article about to be published in the [Proceedings of the National Academy of Sciences](#) that reviews the early [fossil record](#) and anatomical features of anthropoids - the primate group that includes monkeys, apes, and humans.

Last spring's much-publicized article on *Darwinius* was released in conjunction with a book, a History Channel documentary, and an exhibit in the American Museum of Natural History. At a news conference attended by New York Mayor Michael Bloomberg, the authors unveiled the nearly complete [fossil](#) of a nine-month-old female primate that had been found at the site of Messel in Germany.

But other anthropologists were immediately skeptical of the conclusions and began writing the responses that are being published this month.

"Just because it's a complete and well-preserved fossil doesn't mean it's going to overthrow all our ideas," says Williams, the lead author.

"There's this enormous body of literature that has built up over the years. The *Darwinius* research completely ignored that body of literature."

That literature centers on the evolution of primates, which include haplorhines (apes, monkeys, humans, tarsiers) and strepsirrhines (lemurs, lorises). The two groups split from each other nearly 70 million years ago.

The fossil group to which *Darwinius* belongs - the adapiforms - have been known since the early 1800s and includes dozens of primate species represented by thousands of fossils recovered in North America, Europe, Asia and Africa. Some adapiforms, like North American Notharctus, are known from nearly complete skeletons like that of *Darwinius*. Most analyses of primate evolution over the past two decades have concluded that adapiforms are strepsirrhines, and not direct ancestors of modern

humans.

The most recent such analysis, published last year in the journal [Nature](#), concluded that *Darwinius* is an early strepsirrhine and a close relative of the 39-million-year-old [primate](#) *Mahgarita stevensi* from West Texas.

Nevertheless, the scientists who last year formally described *Darwinius* concluded that it was an early haplorhine, and even suggested that *Darwinius* and other adapiform fossils "could represent a stem group from which later anthropoid primates evolved."

For example, they note that *Darwinius* has a short snout and a deep jaw - two features that are found in monkeys, apes, and humans.

However, Kirk, Williams and their colleagues point out that short snouts and deep jaws are known to have evolved multiple times among primates, including several times within the lemur/loris lineage. They further argue that *Darwinius* lacks most of the key anatomical features that could demonstrate a close evolutionary relationship with living haplorhines (apes, monkeys, humans, and tarsiers).

For instance, haplorhines have a middle ear with two chambers and a plate of bone that shields the eyes from the chewing muscles.

"There is no evidence that *Darwinius* shared these features with living haplorhines," says Kirk. "And if you can't even make that case, you can forget about *Darwinius* being a close relative of humans or other anthropoids."

More information: Journal paper: [doi:10.1016/j.jhevol.2010.01.003](https://doi.org/10.1016/j.jhevol.2010.01.003)

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