

“Missing link” ancestor reported found

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Courtesy PLoS ONE and World Science staff

Scientists say they have found a 47-million-year-old fossil that is a “missing link” from apes, monkeys and humans to other mammals. Discovered in Messel Pit, Germany, the fossil, designated *Darwinius masillae*, is estimated to be 20 times older than most fossils that explain human evolution.

Known as “Ida,” scientists said the fossil shows characteristics from the very primitive non-human evolutionary line of so-called prosimians—creatures such as lemurs—but is more related to the “anthropoids,” the group that includes monkeys, apes and humans.



Darwinius masillae, new genus and species, from Messel in Germany. (Courtesy J. Franzen, P. Gingerich, J. Habersetzer, J. Hurum, W. Koenigswald, et al.)

At 95 per-cent complete, the fossil offers the most complete understanding of any primate so far discovered from the Eocene era, when modern mammals first appeared, according to the investigators. Their findings are published in the research journal Public Library of Science One.

For the past two years scientists led by Jørn Hurum of the University of Oslo Natural History Museum have secretly analyzed the fossil. “This is the first link to all humans ... truly a fossil that links world heritage,” said Hurum.

The fossil was apparently discovered in 1983 by private collectors who split and eventually sold two parts of the skeleton separately; a lesser part was restored and, in the process, partly fabricated to make it look more complete. Scientists said this part was eventually purchased for a private museum in Wyoming, and then described by one of the authors, who recognized the fabrication.

The more complete part has just come to light, and it now belongs to the Natural History Museum of the University of Oslo in Norway. The new paper describes the study that resulted from finally having access to the complete fossil.

Unlike “Lucy” and other famous primate fossils found in Africa’s Cradle of Mankind, Ida is a European fossil, preserved in Germany’s Messel Pit, the milewide crater and oilrich shale is a significant site for fossils of its time, researchers said. Analysis indicated that the prehistoric primate was a young female. A foot bone called the talus bone links Ida directly to humans, according to the investigators.

The fossil also features the complete soft body outline as well as the gut contents: Ida feasted on fruits, seeds and leaves before she died. X-rays reveal both baby and adult teeth. The scientists estimate Ida’s age at death as around nine months, and she measured about three feet (90 cm) long.

Ida is estimated to have lived 47 million years ago at a critical period in Earth’s history: the Eocene, when the blueprints for modern mammals were being established. Following the extinction of dinosaurs, the early horses, bats, whales and many other creatures including the first primates thrived on a subtropical planet. The Earth was just beginning to take the shape that we know and recognize today – the Himalayas were being formed and modern flora and fauna evolved. Land mam-mals, including primates, lived amid vast jungle.

Ida was found to lack two key anatomical features found in lemurs: a grooming claw on the second digit of the foot, and a fused row of teeth in the middle of her lower jaw known as a tooth-comb. She has nails rather than the claw typical of non-anthropoid primates such as lemurs, and her teeth are similar to those of monkeys. Her forward facing eyes are like ours – which would have enabled her fields of vision to overlap, allowing 3D vision and an ability to judge distance.

The fossil’s hands show a humanlike opposable thumb, researchers said. Like all primates, Ida has five fingers on each hand. Ida would have also had flexible arms, which would have allowed her to use both hands for tasks that cannot be done with one – like grabbing a piece of fruit. Like us, Ida also has quite short arms and legs, according to researchers.

X-rays reveal a broken wrist may have contributed to Ida’s death – her left wrist was healing from a bad fracture, said the scientists. They believe she succumbed to carbon dioxide gas while drinking from the Messel lake: its still waters were often covered by a blanket of the gas due to volcanic forces that formed the lake and which were still active. Hampered by her broken wrist, Ida fell unconscious and sank to the lake bottom, where the unique conditions preserved her for 47 million years.

The findings are to be described in a documentary, “The Link,” to be screened by the History Channel on May 25 at 9pm ET/PT and BBC One in the U.K. May 26 at 9pm BST. It will also be broadcast around the world. An interactive website about Ida has been launched at <http://www.re-vealingthelink.com>.

“This little creature is going to show us our connection with all the rest of the mammals,” said broadcaster and naturalist Sir David Attenborough. “The link they would have said until now is missing ... it is no longer missing.”

“One of the consequences of such notions as "entitlements" is that people who have contributed nothing to society feel that society owes them something, apparently just for being nice enough to grace us with their presence.” -- Thomas Sowell

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