

Fossils Hint at Long-Sought Ancestor of Weirdest Human Species

700,000-year-old remains from Indonesia could elucidate the murky origins of the “hobbits” in our family tree

[Kate Wong](#) June 9, 2016



Skull of an anatomically modern human (*right*) dwarfs the *H. floresiensis* skull from the site of Liang Bua on Flores (*left*). The area highlighted in blue shows the area of jaw anatomy preserved in the new jaw fossil from Mata Menge. Credit: Kinez Riza

It is often said that every family has that one weird relative. Among the species that make up the human family, that relative is surely [Homo floresiensis](#). Nicknamed the [hobbit](#), this creature stood just over a meter

tall with short legs, big feet and a tiny brain the size of a grapefruit—all primitive traits associated with human ancestors from millions of years ago. Yet *H. floresiensis* lived on the island of Flores in Indonesia as recently as 60,000 years ago, by which point human species with modern body and brain proportions—including *Homo sapiens* and Neandertals—were well established elsewhere in the world.

How did the Flores hobbits come to have their out-of-time features? Scientists have been [puzzling over this question](#) ever since the bizarre remains, found in a cave called Liang Bua in western Flores, were unveiled in 2004. Now new finds have emerged from another site on the island. Their discoverers say these fossils, which date to 700,000 years ago, illuminate the hobbits' mysterious origin. But other researchers are not so sure.



Homo floresiensis is a mini human species that lived on the island of Flores in Indonesia as recently as 60,000 years ago. Reconstruction by Atelier Elisabeth Daynes.

Credit: Kinez Riza

To date, paleoanthropologists have focused mainly on two competing hypotheses about how *H. floresiensis* evolved. The first holds that it descended from *Homo erectus*, a taller, larger-brained species that was the first member of the human family to spread out of Africa into other parts of the world. In this scenario the diminutive body and brain of *H. floresiensis* evolved after its ancestor reached Flores, as adaptations to the limited food available on the island. Such dwarfing is well known in other large mammal species that colonize islands, including members of the elephant family, but had never before been documented in humans.

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The second explanation posits that *H.*

floresiensis descended from a more primitive ancestor that itself had a small body and brain, possibly *Homo habilis* or a member of the genus *Australopithecus*. In this scenario, *H. floresiensis* would have already been small when it arrived on Flores, retaining those primitive features—as well as others found in the arm, wrist, hand and foot—from its direct ancestor. But ancestors that primitive have never been discovered outside of Africa.

A third scenario, advanced by a small but vocal minority, is that the remains do not represent a distinct species at all but instead belong to *H. sapiens* individuals who had some kind of developmental disorder.

The absence of any human fossils from Flores that are older than the Liang Bua remains has hampered efforts to test these hypotheses—until now. In a pair of papers published in the June 9 *Nature*, Gerrit van den Bergh and Adam Brumm of the University of Wollongong in Australia and their colleagues announced their discovery of a collection of human fossils from a site in central Flores called Mata Menge that date to 700,000 years ago. The researchers have provisionally assigned the fossils—a piece of a small lower jaw and six small isolated teeth from at least three individuals—to *H. floresiensis* and suggest that they represent the direct ancestor of the Liang Bua hobbits.



Researchers have recovered a piece of lower jaw (above) and several teeth from the site of Mata Menge on Flores. The remains date to 700,000 years ago and are as small as those of the much younger *H. floresiensis* remains found at the site of Liang Bua. *Credit: Kinez Riza*

Analysis of the new jaw and teeth showed that they are similar in size and shape to their counterparts from Liang Bua, albeit less specialized in several respects, which is what one would expect to see in an ancestral hobbit. The authors note that other evidence from Mata Menge and Liang Bua support this close connection between the two groups: The simple stone tools at both sites are remarkably similar, too. The team also compared the Mata Menge jaw and teeth with those of other human species, including *Australopithecus* and *H. habilis*, and concluded that on the whole their find was more derived than those species, with features that call to mind *H. erectus*. Thus, they argue, their results support the hypothesis that *H. floresiensis* is a dwarfed descendant of *H. erectus* rather than a scion of a more primitive human ancestor.

The Mata Menge remains hint that this dwarfing occurred surprisingly quickly. The oldest known evidence of humans on Flores—a collection of stone tools from a site called Wolo Sege—date to around a million years ago. No human remains have turned up in association with those ancient tools, but if they were made by the big ancestor of the tiny Mata Menge people that lived 700,000 years ago, then the hobbits' small body size may have evolved within perhaps just 300,000 years. That rapid diminution stands in sharp contrast to an evolutionary trend seen in other human fossils from the Pleistocene epoch, which spanned the time from around 2.6 million to 11,600 years ago. "Human body and brain size increased in the Pleistocene, but Flores shows that it was not unidirectional," Van den Bergh said during a press teleconference on June 6.

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Animal fossils found at the site show that the Mata Menge humans lived in a savannalike habitat with grasslands and fresh water nearby. Rodents, crocodiles, elephant relatives called stegodonts, Komodo dragons and an array of birds shared their world. Whether the pint-size people might have eaten any of these creatures is unknown; their stone tools would have enabled butchery, but the researchers did not find cut marks on any of the animal bones.

Paleoanthropologists not involved in the new discovery call the finds exciting and important. "They have made a very strong case" for a link between the Mata Menge fossils and the remains from Liang Bua, comments Fred Grine of Stony Brook University, S.U.N.Y., an expert on early human teeth. He notes that the small size of the new specimens would be enough to suggest such a relationship; the shape similarities strengthen the claim. Grine shares the team's view that the remains support the notion that *H. floresiensis* is a dwarfed descendant of *H. erectus*. He adds that the new fossils kill the notion that the hobbits were

merely diseased *H. sapiens* individuals. It is “difficult to argue this with another substantially older site now preserving the same type of material,” he explains.



Molar and incisor teeth are among the Mata Menge finds. *Credit: Kinez Riza*

But other experts have reservations about the team’s claims. Shara Bailey of New York University, who also specializes in fossil human teeth, says that nothing about the Mata Menge specimens ties them to *H. floresiensis* from Liang Bua apart from possibly the small size of the lower jaw. The shape characteristics of the Mata Menge teeth do not demonstrate a link, she contends, although they do not preclude such a link either. Bailey adds that the discovery of a lower third premolar (P3 in the parlance of anatomists) at Mata Menge could help settle the matter, because that tooth has a very distinctive shape in *H. floresiensis* from Liang Bua. “If they found a lower P3 that closely resembled the P3 of [Liang Bua], then I would be convinced,” she says.



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Adam van Arsdale of Wellesley College, who specializes in fossil human jaws, expresses similar doubts about the argument that the Mata Menge remains represent the direct ancestor of the Liang Bua hobbits. "I am skeptical that the morphology of the specimens they have is sufficient to truly exclude specific relationships between the Mata Menge material and other Pleistocene [human] lineages," he says. That is, the new finds are not diagnostic enough to rule out alternative possibilities for where they belong in the human family tree.

More definitive fossils may come. "The search is ongoing," Brumm remarked in the press teleconference. He and his colleagues are now excavating sediments at Mata Menge dating to 900,000 years ago as well as other, earlier sites in the Soa Basin region of Flores. Topping his wish list: "legs and arms, wrists and feet, which are where the really curious features of *floresiensis* appear."

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