



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

University of Wollongong
Research Online

Faculty of Science, Medicine and Health - Papers

Faculty of Science, Medicine and Health

2016

A 700,000-year-old fossil find shows the Hobbits' ancestors were even smaller

Gerrit D. van den Bergh

University of Wollongong, gert@uow.edu.au

Adam R. Brumm

Griffith University, abrumm@uow.edu.au

Publication Details

van den Bergh, G. D. & Brumm, A. R. (2016). A 700,000-year-old fossil find shows the Hobbits' ancestors were even smaller. *The Conversation*, 9 June 1-5.

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library:
research-pubs@uow.edu.au

A 700,000-year-old fossil find shows the Hobbits' ancestors were even smaller

Abstract

It was back in October 2004 when archaeologists first unveiled the partial skeleton of a tiny, small-brained hominin previously unknown to science, now known as *Homo floresiensis*.

Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

Publication Details

van den Bergh, G. D. & Brumm, A. R. (2016). A 700,000-year-old fossil find shows the Hobbits' ancestors were even smaller. *The Conversation*, 9 June 1-5.

THE CONVERSATION

A 700,000-year-old fossil find shows the Hobbits' ancestors were even smaller

June 9, 2016 6.06am AEST

Gerrit (Gert) van den Bergh

Researcher in palaeontology, University of Wollongong

Adam Brumm

Senior Research Fellow, Griffith University

The Conversation's partners

[View partners of The Conversation](#)



Image (left) of the Mata Menge lower jaw fragment (SOA-MM4) superimposed on the *Homo floresiensis* skull (LB1) from Liang Bua, and compared with a modern human skull from the Jomon Period of Japan. Y. Kaifu, Author provided

It was back in October 2004 when archaeologists first unveiled the partial skeleton of a tiny, small-brained hominin previously unknown to science, now known as *Homo floresiensis*.

These "Hobbit"-like creatures first appeared at Liang Bua cave, on the Indonesian island of Flores, about 95,000 years ago. Previously, it was believed they had lived on Flores until quite recently, but new evidence published earlier this year suggests they were extinct by around 50,000 years ago.

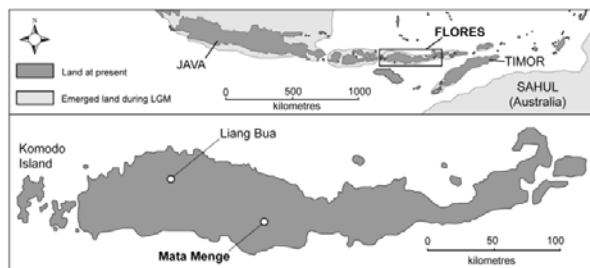
Two hypotheses account for the evolutionary origin of *Homo floresiensis*.

The first is that Hobbits descend from *Homo erectus*, or "Java Man", an archaic Asian hominin roughly similar in stature to us. A small population of *Homo erectus*, it is thought, got marooned on Flores and shrunk in body size.

The second hypothesis is that the ancestor of *Homo floresiensis* was an even more ancient hominin that was pint-sized to begin with. Candidates include *Homo habilis* or an Australopithecine, both known only from the fossil record of Africa.

A challenge

Only months after the first Hobbit bones came to light, our friend and colleague Mike Morwood, co-discoverer of *Homo floresiensis*, set us the great challenge of unravelling the mystery of the Hobbit's beginnings. And to do so, it was crucial to discover the identity of the first hominin colonisers of Flores.



Map of Flores showing the locations of Liang Bua cave (the original 'Hobbit' site) and the open site of Mata Menge in the So'a Basin, where fossils of ancient Hobbit-like creatures have now been found. LGM: Last Glacial Maximum (~22,000-19,000 years ago). Author provided

We were already aware of the existence of ancient sites in the So'a Basin 70km east of Liang Bua. In the 1960s a Dutch priest named Theodor Verhoeven had discovered and excavated several sites with fossils of extinct megafauna and stone tools associated.

In the late 1990s, Mike's work here with two of us (van den Bergh and Kurniawan) showed that hominin tool-makers were present by 840,000 years ago.

The So'a Basin at that time comprised a tropical savannah drained by numerous small stream channels. These grasslands teemed with pygmy *Stegodon* (an extinct Asian elephant), Komodo dragons and rats. Fossils from these species are preserved within rock strata that are exposed by erosion on the present land surface.

The fossil beds accumulated between 1.3 million to 500,000 years ago.

Our small-scale digs in the basin had already unearthed hundreds of fossils of *Stegodon* and other animals, as well as stone artefacts. In all likelihood ancestors of *Homo floresiensis* left these simple tools behind.

Frustratingly, however, we had never found a single bone or tooth from one of the tool-makers. We had to find these fossils.

Some observers thought that such elusive objects would only ever be found by chance, perhaps by local farmers, and probably not within our lifetimes.

The only way to accomplish our objective was to think big.

The big dig

In 2010, using funds from the Australian Research Council and the Geological Agency of Indonesia, we assembled an international team of researchers and recruited more than 120 workers from local villages.



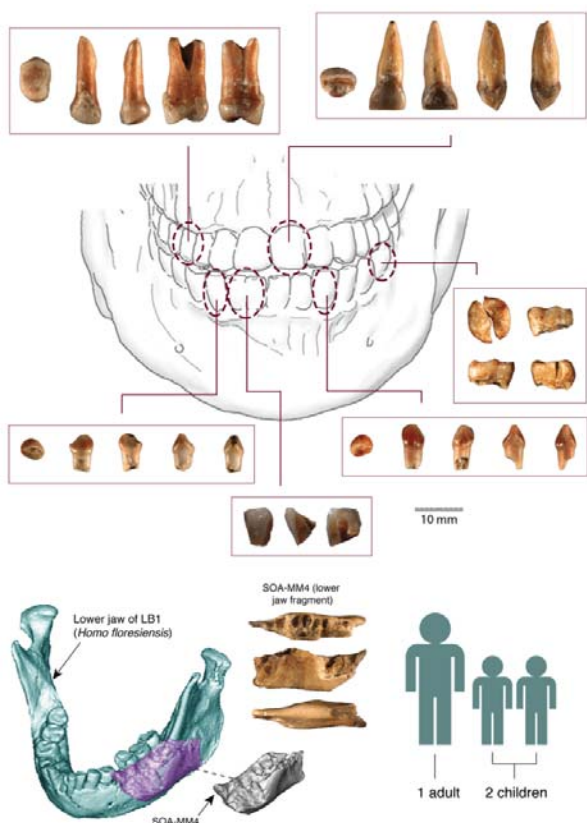
Excavations at Mata Menge exposing the fossil bones of pygmy *Stegodon*, an extinct relative of Asian elephants.

Author provided

At the site of Mata Menge we initiated one of the largest fossil digs ever undertaken in Southeast Asia since Eugene Dubois's famous 1890s dig at Trinil in Java that uncovered the first known fossils of *Homo erectus*.

It took us five years of painstaking excavation in concrete-like sandstone, but on October 8, 2014 – only weeks before the project's end – we finally found what we were looking for.

It was a young Indonesian woman, aspiring palaeontologist and PhD student Mika R Puspaningrum, who first identified it. A tiny hominin molar. More teeth followed, then a skull fragment and a piece of jaw emerged from the hard grey sandstone.



Hominin fossils discovered at Mata Menge, comprising six teeth and a fragment from a lower jaw. The fossils represent the remains of at least three individual hominins (one adult and two young children) and date to around 700,000 years ago. Regarding the jaw fragment from Mata Menge, the lower

jaw of the *Homo floresiensis* skeleton (LB1) from Liang Bua is shown as a size comparison. Photos and micro-CT scan of the fossils are courtesy of Y. Kaifu; the top image was created by S. Hayes, Author provided

The Mata Menge fossils represent the remains of at least three or more hominin individuals, including an adult, and, astoundingly, two young children.

The sandstone containing these fossils was deposited at least 700,000 years ago, which is ten times older than the *Homo floresiensis* skeleton from Liang Bua.

The Mata Menge hominin is much smaller in size than *Homo erectus* from Java, but the teeth and jaw fragment do not resemble any pre-*erectus* hominin species. In fact, their closest affinity is with *Homo floresiensis*.

More Hobbits

No one predicted the ancestor of the Hobbit would itself have looked like a Hobbit.

Although the Mata Menge hominins are remarkably Hobbit-like, the jaw fragment is from an adult that was 21% smaller in size than the tiniest Liang Bua Hobbit.

Homo floresiensis may actually be a bigger version of its ancestor!



Leaders of the Mata Menge dig sitting around the fossil tusk of a pygmy Stegodon. (Top left) Gerrit D 'Gert' van den Bergh, from University of Wollongong, (top right) Iwan Kurniawan, from the Vertebrate Paleontology Laboratory at Bandung's Geology Museum (Indonesia), and (bottom) Adam Brumm, from the Griffith University Research Centre of Human Evolution. Author provided

Importantly, the lower molar from Mata Menge has five cusps instead of four (unlike the Liang Bua Hobbits, in which the fifth cusp is reduced), and most resembles those of *Homo erectus* in shape (but much smaller).

In sum, the Mata Menge fossils suggest that *Homo floresiensis* is indeed a kind of pygmy *Homo erectus*. It now appears that these castaways dwarfed in size soon after making landfall on Flores (or another nearby island, such as Sulawesi).

But Flores is full of surprises.

Until we find more complete hominin remains at Mata Menge, or even older fossil sites, we cannot be certain about the identity of the Hobbit's ancestor and thus how this evolutionary saga began.

Our search for fossils – and funds – continues.

Iwan Kurniawan, curator at the Geology Museum in Bandung, Indonesia, was a contributor to this article.



Archeology

Hobbit

Homo floresiensis



Tweet9



Share



Get newsletter

Donate

If you value The Conversation, please show your support and donate to our annual reader campaign.



Make a donation