

The Curious Case of *Homo floresiensis*: Selection or Pathology

Stone Tools and Fossils on East Indonesian Island

LB1: A Small-Bodied Hominin from Late Pleistocene

Age of a New Hominin

Why the small size?

Homo Sapiens Skeletal Remains

Brain of LB1

Homo floresiensis

Homo floresiensis

- **Nature 1998: Fission-track ages of stone tools and fossils on the east Indonesian island of Flores**
 - o Stone tools from 840,000 years ago found in Flores
 - o Flores was not connected to mainland since early Pliocene
 - o Conclusion: *H. erectus* was a seafarer, who had sailed to the island
- **Nature 2004: A new small-bodied hominin from the Late Pleistocene of Flores, Indonesia**
 - o **LB1**
 - Ancestral Traits
 - Small brain size: 417 cc
 - Brow ridges
 - No chin

- Derived traits
 - Small teeth
 - Narrow nasal opening
 - Short face
 - Nicknamed “the Hobbit”
 - Brain is 1/3 size of modern human brain
 - Only 3 feet tall as an adult
 - Dates to just 60,000 years ago
 - The lower limbs are very short
 - Comparing LB1 to African Pygmy and modern human
 - Upper arm ([humerus](#)) is straight rather than twisted
 - Lower arm ([ulna](#)) is short and straight
- **Letters to Nature 2004: Archaeology and age of a new hominin from Flores in eastern Indonesia**
 - o Fossils are found in sediments with stone tools
 - Many look like Oldowan flake tools
 - Some resemble more sophisticated technology
 - o Sediments also contain evidence of butchered stegodons (dwarf elephants), komodo dragons, bats, giant rats, etc., and fire for potentially cooking meat.
 - o LB6
- **What explains the small size?**
 - o Insular dwarfing (the “island rule”)
- **PNAS 2006: Pygmoid Australomelanesian *Homo sapiens* skeletal remains from Liang Bua, Flores: Population affinities and pathological abnormalities**

- o Some skeptics argued that LB1 was a recent, modern human ancestor of pygmies that still live in the area
- o Others pointed out that the brain size was even smaller than it should be, given the body size
- o Microcephalic dwarfism: a genetic disorder whose victims have small bodies and small brains but sometimes near-normal intelligence
- **The Brain of LB1 *Homo floresiensis***
 - o While the size of the brain is similar to pygmies or microcephalics, the shape of the brain is very different
 - o LB1 is not a pygmy or a Microcephalic modern human based on the shape of the brain
- **Nature 2009: Insular dwarfism in hippos and a model for brain size reduction in *Homo floresiensis***
 - o Brain capacities of an extinct dwarf species of hippo from Madagascar are up to 30% smaller than those of a mainland African ancestor scaled to equivalent body mass
 - o Brain size and body size need not scale linearly during insular dwarfism
 - o The Primitive Wrist of *Homo floresiensis* and its implications for hominin evolution
 - *H. floresiensis* wrist bones resemble those of an Australopith or a modern ape more closely than those of a modern human
- **Nature 2009: The foot of *Homo floresiensis***
 - o The foot looks more like that of a Pliocene australopithecine than a modern human or even *H. erectus*

The origin & spread of *Homo sapiens*

Paradoxical Mix of Features in Neanderthals

Which morphological characteristics mark *H. Sapiens*?

When and Where did *h. sapiens* first appear?