

### Findings about a new species of primate.

This new species is a small-bodied hominin species that is dated to between 95,000 and 17,000 years ago. It displays a surprising combination of cranial features that resemble those of *Homo erectus* and *Homo sapiens*, postcranial features (features of the limb and trunk) that most closely resemble those of species in the genus *Australopithecus*, and a stone tool technology linked to those often associated with *H. sapiens*. If the fossils assigned this species do not represent a population of pathological *H. sapiens*, as some researchers have argued, they represent a new hominin species and suggest *H. sapiens* shared the planet with another species much more recently than previously believed.

The cranial material comprises teeth and mandibles (lower jaws) from multiple individuals and a single, nearly complete skull. The skull and teeth share some derived features (features not found in the common ancestor) shared with *H. erectus* and *H. sapiens*. The face is small, specifically in facial height (a measurement between the brow and the upper teeth) and exhibits reduced prognathism (how far the upper and lower jaws project out from the face) compared to australopith species. The molars (the teeth at the back of the jaw) and canines are also relatively small, similar to the condition found in *H. erectus* and *H. sapiens*. These Indonesian fossils also possess many primitive features similar to earlier hominins. For example, the brain is very small (380 to 420 cubic centimeters) and is more similar to apes and species in the genus *Australopithecus*. The mandibles and premolars (bicuspid teeth), which represent at least 8 partial individuals, share distinctive primitive traits with both *Australopithecus* and *Homo habilis*. The premolars are asymmetrical and elongated with complex tooth roots. The mandibles are relatively robust and large in size; yet lack a chin (central part of the lower jaw that protrudes out from the face, found only in *H. sapiens* mandibles).

Some researchers argue the species remains are those of a diseased individual of our own species and have suggested a number of pathologies that could explain the mosaic of features exhibited by these remains. Pathologies that have been suggested include various forms of microcephaly (a class of genetic disorders in which the head and brain are abnormally small) and growth disorders. Detailed comparisons of the species material, however, seem to provide little support for these hypotheses.

Some researchers have suggested this species represents a dwarfed descendent of Asian *H. erectus* populations. However, there is no evidence for larger-bodied (non-dwarfed) ancestors on the island, making this hypothesis difficult to test.

The stone artifact assemblages found in association with the skeletal remains of are dense and demonstrate continuity in production method and tool type throughout the cave deposits. There are a large number of bifacial (struck on both sides) and radial (struck from the outer edge towards the center) cores (rocks from which pieces [flakes] are chipped to produce tools), similar to the Oldowan stone artifact assemblages in East Africa. More complex tools—e.g., points (sharpened, pointed tools), perforators (tools designed to make holes or incisions), blades (flake that is at least twice as long as it is wide) and microblades (blades less than 10 mm, often components of composite tool technology)—have also been recovered. The combination of primitive, Oldowan-like core technology with more advanced tool assemblages is quite uncommon in the archaeological record and make interpretations of the stone tool assemblages found in association with this species difficult. Some researchers have questioned whether this possible hominin had the cognitive capacity to make the more complex tools, citing its small brain size. However, no clues of *H. sapiens* existence have been found at sites, suggesting that the individuals found were the manufacturers of all of the tools found at this site.

