

Mysterious ancient human crossed Wallace's Line

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Scientists have proposed that the most recently discovered ancient human relatives—the Denisovans—somehow managed to cross one of the world's most prominent marine barriers in Indonesia, and later interbred with modern humans moving through the area on the way to Australia and New Guinea.

Three years ago the genetic analysis of a little finger bone from Denisova cave in the Altai Mountains in northern Asia led to a complete genome sequence of a new line of the human family tree—the Denisovans. Since then, genetic evidence pointing to their hybridisation with modern human populations has been detected, but only in Indigenous populations in Australia, New Guinea and surrounding areas. In contrast, Denisovan DNA appears to be absent or at very low levels in current populations on mainland Asia, even though this is where the fossil was found.

Published today in a *Science* opinion article, scientists Professor Alan Cooper of the University of Adelaide in Australia and Professor Chris Stringer of the Natural History Museum in the UK say that this pattern can be explained if the Denisovans had succeeded in crossing the famous Wallace's Line, one of the world's biggest biogeographic barriers which is formed by a powerful marine current along the east coast of Borneo. Wallace's Line marks the division between European and Asian mammals to the west from marsupial-dominated Australasia to the east.

"In mainland Asia, neither [ancient human](#) specimens, nor geographically

isolated modern Indigenous populations have Denisovan DNA of any note, indicating that there has never been a genetic signal of Denisovan interbreeding in the area," says Professor Cooper, Director of the University of Adelaide's Australian Centre for Ancient DNA. "The only place where such a genetic signal exists appears to be in areas east of Wallace's Line and that is where we think interbreeding took place—even though it means that the Denisovans must have somehow made that marine crossing."

"The recent discovery of another enigmatic ancient human species *Homo floresiensis*, the so-called Hobbits, in Flores, Indonesia, confirms that the diversity of archaic human relatives in this area was much higher than we'd thought," says Professor Stringer, Research Leader in Human Origins, Natural History Museum, in London. "The morphology of the Hobbits shows they are different from the Denisovans, meaning we now have at least two, and potentially more, unexpected groups in the area.

"The conclusions we've drawn are very important for our knowledge of early human evolution and culture. Knowing that the Denisovans spread beyond this significant sea barrier opens up all sorts of questions about the behaviours and capabilities of this group, and how far they could have spread."

"The key questions now are where and when the ancestors of current humans, who were on their way to colonise New Guinea and Australia around 50,000 years ago, met and interacted with the Denisovans," says Professor Cooper.

"Intriguingly, the genetic data suggest that male Denisovans interbred with modern human females, indicating the potential nature of the interactions as small numbers of [modern humans](#) first crossed Wallace's Line and entered Denisovan territory."

More information: "Did the Denisovans Cross Wallace's Line?," by A. Cooper, C.B. Stringer, *Science*, 2013.

Provided by University of Adelaide

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