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## Lice tell mankind's story

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A new study of the phylogeny of human head and body lice provides evidence that *Homo sapiens* once made direct physical contact with a more archaic lineage. The findings, published in [PLoS Biology](#) this week, show how humans' evolutionary past can be pieced together by understanding what happened to our [closely co-adapted parasites](#), say the authors (*PLoS Biology* 2004, **2**:e340).

Modern humans - *Homo sapiens* - are generally thought to have passed through a tight population genetic "bottleneck" somewhere between 10,000 and 20,000 years ago. Parasites such as lice tend to be highly species specific, so by unravelling their evolutionary history it's possible to see past the bottleneck, according to the Florida Museum of Natural History's [David Reed](#), lead author of the paper.

"The addition of parasite data to studies of primate and human evolutionary history is similar to having multiple camera angles recording an event," Reed told us. "We aim to create a better picture of human evolutionary history by studying lice, which might tell us something that human genetic studies alone either have not or cannot."

Humans today play host to two separate genetic lineages of head and body lice. Although both occupy the same ecological niche, their most recent common ancestor lived over a million years ago, the study reports. One lineage has a global distribution, whereas the other appears to be limited to the New World.

Reed and his colleagues present evidence that the New World lineage originally co-evolved with [Homo erectus](#), but switched hosts to *Homo sapiens* around 25,000 years ago. The switch took place in Asia, the authors suggest, before the colonization of North America across the Bering Straits. The effective isolation of New World human populations until only a few hundred years ago allowed this second louse lineage to persist.

Todd Disotell, of New York University's Department of Anthropology, was impressed by the study. "When I read this paper I was both intrigued and excited by Reed et al.'s findings," he said.

"I think that the conclusion that there was contact [in Asia] between remnant *Homo erectus* populations and modern *Homo sapiens* is correct, but the exact nature of that contact will be a continuing controversy," said Disotell. Physical contact certainly took place for the transmission of lice to be possible, but this doesn't necessarily equate to genetic transmission, or even sexual intercourse, between the two human groups, he told us.

Mark Stoneking, at the Max Planck Institute for Evolutionary Anthropology, Germany, told us that he has serious reservations about the way these data have been interpreted. "The provocative suggestion that modern humans had direct contact with *Homo erectus* rests on the estimated coalescence time for the two lice mtDNA lineages," he said. "But coalescence time is largely a function of population size - the bigger the population, the older the most recent common ancestor." This means that if the researchers had used a larger figure for their estimate of the louse population size, they would have arrived at an older date for the point where the two lineages split, Stoneking said.

Stoneking, who was not involved in the study, also questioned some of the other conclusions. "When Reed's data are combined with other published results, the argument for contact between *Homo sapiens* and *Homo erectus* in Asia falls apart," he said.

"For example, if the coalescence time of 1.2 million years for human lice mtDNA reflects either a larger population size for lice or is simply a chance result due to the large variance associated with such estimates, it's possible that human lice have the same evolutionary history as modern humans," Stoneking said. "In that case, there need never have been transfer of lice from archaic to modern humans."

However, Reed said he is confident that the *Homo erectus* louse hitched a ride to the New World on *Homo sapiens*. "We're not sure just yet whether modern humans crossed the Bering Straits with one or both types of lice," he said. "But because it's still here in large numbers, my bet is that it arrived without competition from the louse that modern humans should have had."

## References

1. *PLoS Biology*, [<http://www.plosbiology.org>]
2. Blackman S: The hirsute, the hairless, and the human *The Scientist*, 17:64, November 3, 2003., [[http://www.the-scientist.com/yr2003/nov/close\\_031103.html](http://www.the-scientist.com/yr2003/nov/close_031103.html)]
3. David L. Reed, [<http://www.flmnh.ufl.edu/natsci/mammalogy/mammalogy.htm>]
4. Number of ancestral human species: a molecular perspective