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Archaeogenetics reveals unknown migration in the South Pacific

Only some 3500 years ago people began to colonize the South Pacific archipelagos of Oceania. An international team of researchers including scientists from the Max Planck Institute for the Science of Human History in Jena now analyzed for the first time, the genomes of the first settlers who lived on the island chains Tonga and Vanuatu 3100-2500 years ago. The results, published today in Nature contradict common assumptions about the colonization of the region and point to another large and previously unknown migration wave from Melanesia.

A group of people set out from the Solomon Island chain in the southwestern edge of the Pacific Ocean and steered their outrigger canoes toward the horizon more than 3,500 years ago. These people and their descendants were to be the first to cross more than 350 kilometer stretches of open sea into a region known as Remote Oceania. It was the last great movement of humans to unoccupied but habitable lands.

Now a scientific team led by researchers at Harvard Medical School, University College Dublin, and the Max Planck Institute for the Science of Human History in Jena for the first time have analyzed DNA from people who lived in Tonga and Vanuatu between 2,500 and 3,100 years ago, and were among the first people to live on these islands.

"This is the first genome-wide data on prehistoric humans from the hot tropics, and was made possible by improved methods for preparing skeletal remains" says Dr. Ron Pinhasi at University College Dublin, a senior author of the study. "DNA gets degraded very quickly in tropical climates, however we found that in the very dense inner ear bone, called the petrous bone, DNA is well preserved even under such adverse environmental conditions for thousands of years," says Cosimo Posth, doctoral student at the Max Planck Institute for the Science of Human History in Jena.

Genetic evidence overturn established colonization model

The result of genetic analysis was a big surprise for the research team: the ancient individuals carried no trace of ancestry from people who settled Papua New Guinea more than 40,000 years ago, in contrast to all present-day Pacific islanders who derive at least one-quarter of their ancestry from Papuans. Instead, the early islanders resemble genetically people who live in China and Taiwan. This means - contrary to previous assumptions - that the Remote Oceanian pioneers swept past the archipelago that surrounds New Guinea without much mating with local people.

"A major and not previously recognized migration must have spread the Papuan ancestry that is found everywhere in the Pacific today" says Dr. David Reich, a senior author at Harvard Medical School and at the Howard Hughes Medical Institute.

"The unexpected results about Oceanian history highlight the power of ancient DNA to overthrow established models of the human past", says Johannes Krause, Director at the Max Planck Institute for the Science of Human History in Jena.

“A particularly striking finding is the different ancestry observed on the X-chromosome, which is inherited mainly from females” says lead author Dr. Pontus Skoglund of Harvard Medical School and Stockholm University. “This reveals that the vast majority of the ancestry from these open water pioneers that survives today is derived from females, showing how DNA information can provide insights into cultural processes in ancient societies”.

Publikation:

Pontus Skoglund, Cosimo Posth, Kendra Sirak, Matthew Spriggs, Frederique Valentin, Stuart Bedford, Geoffrey A. Clark, Christian Reepmeyer, Fiona Petchey, Daniel Fernandes, Qiaomei Fu, Eadaoin Harney, Mark Lipson, Swapan Mallick, Mario Novak, Nadin Rohland, Kristin Stewardson, Syafiq Abdullah, Murray P. Cox, Françoise R. Friedlaender, Jonathan S. Friedlaender, Toomas Kivisild, George Koki, Pradiptajati Kusuma, D. Andrew Merriwether, Francois-X. Ricaut, Joseph T. S. Wee, Nick Patterson, Johannes Krause, Ron Pinhasi, and David Reich. Ancient genomics and the peopling of the Southwest Pacific. Nature, published online, <http://dx.doi.org/10.1038/nature19844>

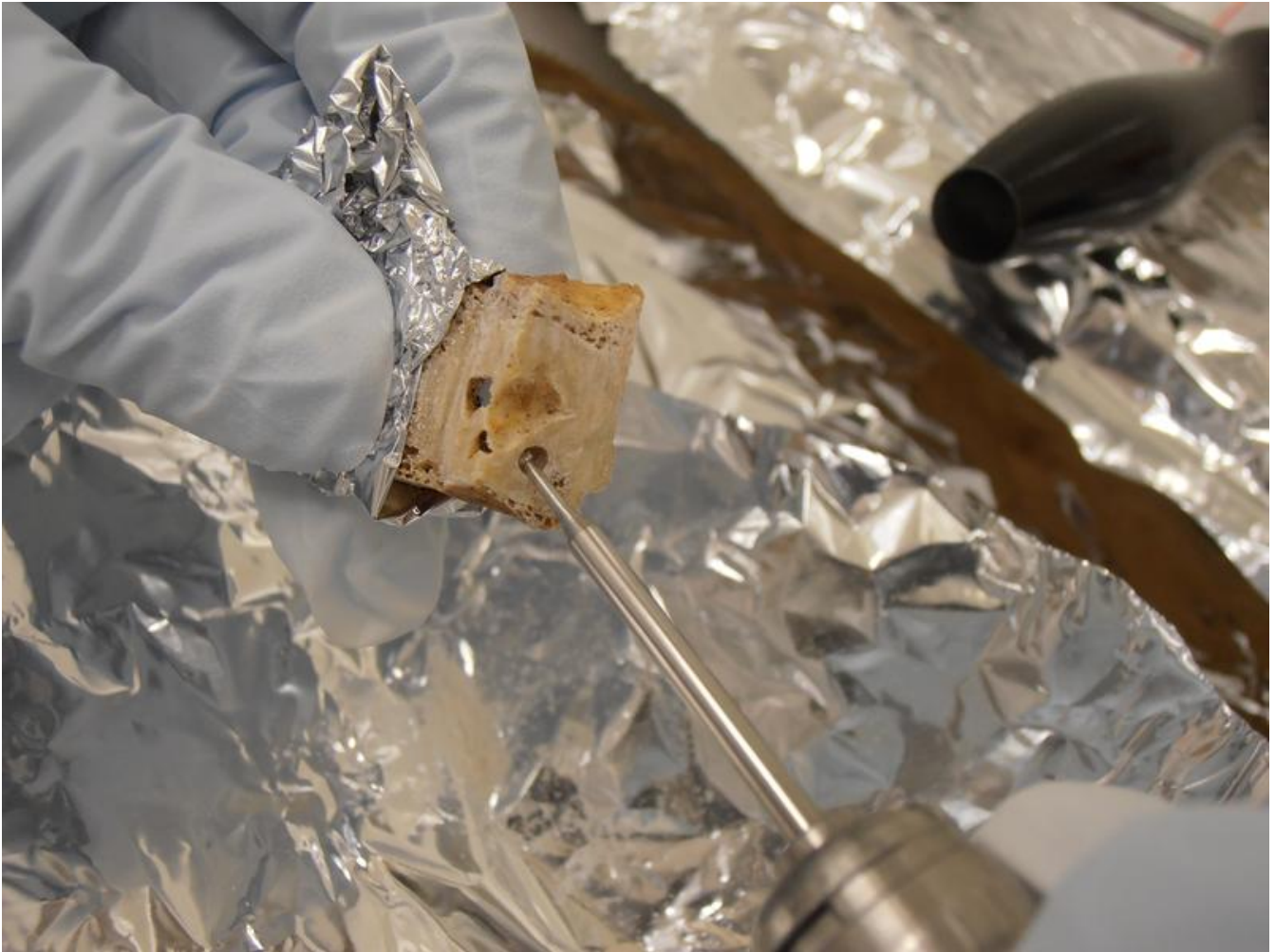
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The peopling of the the South Pacific archipelagos of Oceania was the last great movement of humans to unoccupied but habitable lands.
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Sampling a petrus bone - in this very dense inner ear bone DNA is well preserved even under adverse environmental conditions
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