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Researchers analyzed the genomes of 317 Indigenous Oceanian people to reconstruct a history of migration through the vast island region. MARC DOZIER

## Study reveals ‘exciting’ history of humans in Pacific. But critics blast lack of Indigenous input

By [Michael Price](#) | Apr. 14, 2021 , 11:20 AM

It was one of the boldest journeys in human history: People ventured into the open Pacific Ocean in double-hulled canoes, crossing thousands of kilometers to find and settle far-flung lands. Now, a study of the genomes of hundreds of modern Indigenous residents of Oceania provides new insights into the routes those ancient voyagers took—and who they encountered along the way. The findings suggest more mingling among ancient people in the region than many scientists had thought, including four mixing events with the extinct Denisovan lineage. Despite those intriguing results, critics say the authors failed to

meaningfully involve members of the Indigenous communities who provided DNA for the study.

"It's a really exciting paper," says Lisa Matisoo-Smith, an anthropologist at the University of Otago, Dunedin. But she says it is somewhat troubling that the paper, which has no Indigenous authors, does not make clear the extent to which Indigenous communities were engaged. Meaningfully involving such communities "makes our research and our interpretations richer," she says.

Based on archaeological and linguistic data, anthropologists long ago developed a basic model of how humans came to call Oceania and the Pacific Islands home: Hunter-gatherers crossed into Near Oceania—a region including New Guinea, the Bismarck Archipelago, and the Solomon Islands—some 45,000 years ago. About 5000 years ago, farmers from what is now Taiwan headed south into the Philippines. According to this "out of Taiwan" model, they moved past Near Oceania and into Remote Oceania—which includes Micronesia, Vanuatu, and Fiji—bypassing the people already living in the region. A 2016 study of ancient genomes found that these migrants **didn't mix with the populations already living on the islands**, suggesting they moved quickly. These voyagers then began to settle the Polynesian islands farther east about 1000 years ago.

Yet such models oversimplify the story of the islanders and voyagers who settled islands across the South Pacific, adds Keolu Fox, a genome scientist at the University of California, San Diego, and a Native Hawaiian, who wasn't involved with the new work. Most scientists who have developed these models "have never been on a voyaging canoe," he says. "They have no idea ... how [these journeys have] shaped not just our genomes, but our culture and ... connectivity."

In the new study, researchers led by population geneticists Lluís Quintana-Murci at the College of France and Pasteur Institute and Etienne Patin of the Pasteur Institute analyzed DNA from 317 modern—and primarily Indigenous—people representing 20 different Pacific populations. They used data from previously published genomes, which had all been sampled between 1998 and 2018. The authors say they explained the nature of the research to all participants and obtained informed consent from each.

The researchers then sequenced the participants' whole genomes from the banked samples and compared them to genomes from reference databases, including those of modern people in Near Oceania and extinct archaic humans, Neanderthals and Denisovans. By looking at which individuals shared certain point mutations, known as single nucleotide polymorphisms, the researchers pieced together **a rough family tree for the Indigenous populations of the Pacific**. The team also estimated approximately how long it would take for the groups' genomes to diverge in the way they did, suggesting when different peoples would have met or parted ways. In line with previous research, the authors conclude that humans settled Near Oceania about 30,000 to 45,000 years ago, they report today in *Nature*.

The researchers' model then suggests that about 7000 years ago, people from Taiwan embarked on a major expansion through the region. They traveled south, pausing for a couple thousand years, perhaps in the Philippines or Indonesia. Eventually, they continued on to New Guinea and Near Oceania. But counter to the strict "out of Taiwan" model, the researchers found it was a relatively slow journey, with settlers

arriving in the Bismarck and Solomon islands about 3000 years ago, and intermingling with Near Oceanian islanders along the way.

“This ‘out-of-Taiwan’ rejection is a pretty strong finding,” says Cosimo Posth, an archaeogeneticist at the University of Tübingen. “It tells a more complex story” of interaction on the islands.

Quintana-Murci and colleagues also detected four separate introductions of distinct stretches of Denisovan DNA into Oceanic populations. The most recent introduction, among the Philippines’ Agta people, happened about 20,000 to 25,000 years ago. Those results suggest two interesting things about this mysterious human ancestor, Quintana-Murci says: “First, Denisovans may have lived until relatively recently,” he says, “and second, we cannot talk about Denisovans as a homogenous group. Instead, the best we can do is term them ‘Denisova related.’”

In addition, the researchers identified 14 Denisovan-derived genes linked to the functioning of the immune system in modern Pacific populations. These genes may have helped the islanders resist local pathogens, Quintana-Murci says.

As for concerns about lack of Indigenous participation, Quintana-Murci points out that the author list does contain local Taiwanese and Filipino researchers who work closely with Indigenous communities. But norms around sovereignty over genetic data are changing fast. Last week, Princeton University anthropologist Agustín Fuentes and others urged to scientists to push journals and funding agencies to require meaningful community involvement, rather than simple clearance by an ethical review board, at a virtual session of the annual meeting of the American Association of Physical Anthropologists.

For Fox, the paper’s lack of an Indigenous perspective is evident. He says the authors missed an opportunity to learn what kinds of research questions Indigenous communities themselves are interested in. He notes, for example, that the study ignores the introduction of diseases by European colonists, which shaped modern peoples’ genomes; learning more about modern susceptibility to disease could benefit Indigenous communities today. “Why are you talking about Denisovans when you should have been talking about the effects of colonialism on the genome of modern Oceanic populations?” he asks. “Those are the kinds of questions that are empowering for Oceanic communities.”

*With reporting by Dyna Rochmyaningsih.*

**\*Correction, 20 April, 11:20 a.m.:** *This story has been updated to more accurately reflect the views of Lisa Matisoo-Smith.*

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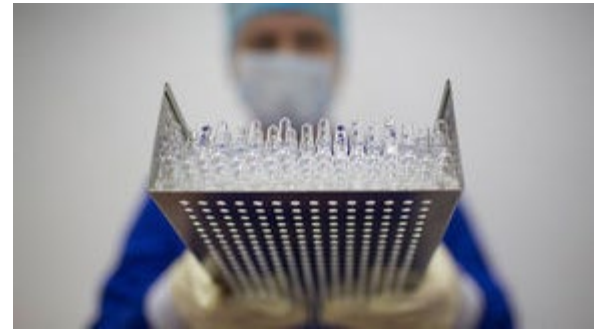
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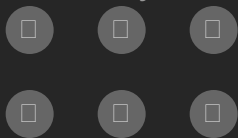
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