

Largest-ever DNA mapping study of the Philippines

March 24 2021, by Elin Bäckström



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Over 50 millennia, at least five major immigration waves have successively populated the Philippines, the most comprehensive survey of genetic variations in the country to date shows. This Uppsala University study, published in the scientific journal *PNAS*, comprises 2.3 million DNA markers from some 1,000 individuals.

"Our findings suggest that instead of farming, climate change may have played a more important role in driving the mass movement of populations in various directions," says Maximilian Larena, researcher at Uppsala University's Department of Organismal Biology and first author of the study.

The Philippines' more than 7,000 islands have always been a link between Southeast Asia, Australia, New Zealand and the Polynesian islands of the Pacific Ocean. For millennia, the archipelago has served as a corridor for migration from one continent to another.

In a new study, a group of researchers from Australia, Taiwan, the Philippines and elsewhere, led by Uppsala University, reveal the huge scale and complexity of the Filipino population's origins, kinship patterns and genetic diversity. By typing 2.3 million DNA markers that are variable in us humans, and then using computational methods, the scientists have investigated the Filipinos' DNA. In doing so, they analyzed these markers from more than 1,000 individuals, representing 115 Filipino cultural groups.

The study shows that over the millennia, at least five major waves of immigration built up the population of the Philippines. Different ethnic groups arrived successively. Negritos, the first Filipinos, were followed by various groups, including those who call themselves the Manobo and Sama.

The last three population waves occurred between 15,000 and 7,000

years ago—a period in which [climate change](#) caused geographical transformations of the region. Sea levels rose, for example. Sunda, until then a large, fertile land mass between Southeast Asia and Oceania, was inundated and the land bridge between Taiwan and southern China was submerged beneath the waters.

"Our study debunks a view that has dominated research on human history: that language, ways of life, culture and people move together as a single unit—a 'Neolithic package', as it's often called. We're able to show that new groups of people migrated to the Philippines more than seven millennia ago, and it was these groups that took the Austronesian languages with them. It wasn't until three thousand years later that agriculture was taken there, probably by related groups. So that happened a long time afterwards," says Professor Mattias Jakobsson, senior author of the study.

More information: Maximilian Larena et al. Multiple migrations to the Philippines during the last 50,000 years, *Proceedings of the National Academy of Sciences* (2021). [DOI: 10.1073/pnas.2026132118](https://doi.org/10.1073/pnas.2026132118)

Provided by Uppsala University

Citation: Largest-ever DNA mapping study of the Philippines (2021, March 24) retrieved 2 May 2024 from <https://phys.org/news/2021-03-largest-ever-dna-philippines.html>

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