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14,000 years, 12,000 miles: Ancient Asians made longest human journey in prehistory

Beyond tracing a remarkable migration, the study also challenges long-standing assumptions about global genetic diversity.

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Representative image.

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A pioneering international genomics study has revealed that ancient Asians were responsible for the longest prehistoric migration in human history, spanning over 12,000 miles (20,000 kilometers) from North Asia to the southern tip of South America.

The study is the product of extensive collaboration among 48 scientists from 22 institutions worldwide and is supported by the GenomeAsia100K consortium.

By analyzing DNA from 1,537 individuals across 139 ethnically diverse groups, the team reconstructed migration routes that began in Africa, passed through North Asia, and ended at Tierra del Fuego in Argentina, marking the final frontier of human expansion on Earth.

“Those migrants carried only a subset of the gene pool in their ancestral populations through their long journey. Thus, the reduced genetic diversity also caused a reduced diversity in immune-related genes, which can limit a population’s flexibility to fight various infectious diseases,” explained Kim Hie Lim, one of the study authors.

“This could explain why some Indigenous communities were more susceptible to illnesses or diseases introduced by later immigrants, such as European colonists. Understanding how past dynamics have shaped the genetic structure of today’s current population can yield deeper insights into human genetic resilience.”

A journey across continents

The research team employed high-resolution whole-genome sequencing to track genetic markers passed down through generations. These patterns of shared ancestry revealed not only when populations diverged but also how they adapted to drastically different environments.

The study estimates that early migrants arrived at the northern edge of South America—where present-day Panama borders Colombia—about 14,000 years ago.

These early settlers endured extreme environmental changes, and their successful adaptation across such varied terrains highlights the resilience and ingenuity of early human communities.

“Our findings highlight the extraordinary adaptability of early, diverse indigenous groups who successfully settled in vastly different environments. Using high-resolution whole-genome sequencing technology at SCELSE, we can now uncover the deep history of human migration and the genetic footprints left behind by the early settlers,” said Elena Gusareva, the study’s first author.

Redefining genomic diversity

Beyond tracing a remarkable migration, the study also challenges long-standing assumptions about global genetic diversity.

Stephan Schuster, the study’s senior author of the paper, said: “Our study shows that a greater diversity of human genomes is found in Asian populations, not [European](#) ones, as has long been assumed due to sampling bias in large-scale genome sequencing projects.”

“This reshapes our understanding of historical population movements and lays a stronger foundation for future research into human [evolution](#). Our new insights underscore the importance of increasing the representation of Asian populations in genetic studies, especially as genomics plays a critical role in personalised medicine, public health, and the understanding of human evolution,” [said](#) Schuster.

By understanding how migration, adaptation, and isolation have shaped genetic resilience, scientists can better comprehend modern population health, inform public health policy, and refine personalized medicine strategies.

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Ultimately, this study offers not just a deeper understanding of our shared past but also a critical lens for shaping future scientific and medical progress.

The study has been published in *Science*.

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ABOUT THE AUTHOR

Srishti Gupta Srishti studied English literature at the University of Delhi and has since then realized it's not her cup of tea. She has been an editor in every space and content type imaginable, from children's books to journal articles. She enjoys popular culture, reading contemporary fiction and nonfiction, crafts, and spending time with her cats. With a keen interest in science, Srishti is particularly drawn to beats covering medicine, sustainability, gene studies, and anything biology-related.

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