

Globetrotting black rat genes reveal spread of humans and diseases

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Black rats collected in a single night in a small village in northern Laos. Credit: Angela Frost, University of Queensland, Australia

DNA of the common Black Rat (*Rattus rattus*) has shed light on the ancient spread of rats, people and diseases around the globe.

Studying the mitochondrial DNA of 165 Black Rat specimens from 32 countries around the world, an international team of scientists has identified six distinct lineages in the Black Rat's family tree, each originating from a different part of Asia.

"Black Rats are carriers of many different human diseases, including plague, typhus and leptospirosis," says CSIRO mammal expert Dr Ken Aplin, lead author of the study.

"It has been unclear why certain rodent-borne diseases are more common in some places than others, but our work raises the possibility that the different lineages of Black Rats each carry a different set of diseases, which is something medical science now needs to consider.

"We need to know more about what types of Black Rats are moving around the world and what disease risks each of them might pose."

The six different lineages originated in India, East Asia, the Himalayas, Thailand, the Mekong Delta, and Indonesia.

The Indian lineage spread to the Middle-East around 20,000 years ago, then later to Europe. It reached Africa, the Americas and Australia during the Age of Exploration.

The East Asian lineage moved from Taiwan to Japan, the Philippines, and Indonesia, arriving in Micronesia only 3,500 years ago.

The other four lineages have not become so widespread but they could be set to expand their ranges in the future.

"Our findings also show a good match between the historic spread of each lineage and ancient routes of human migration and trade, but there are a few surprises that raise new questions about human prehistory," Dr Aplin says.

"The genetic evidence points strongly to there being more than one species of black rat, but more work is needed before we can say exactly how many species there are."

The Black Rat is one of the most common of the world's 56 *Rattus* species, and is also known as the house, roof or ship rat. It is found throughout Africa, Asia, Australia, Europe and the Americas.

Dr Aplin will present the results of his team's research at the Archaeological Science Conference in Canberra, Australia on Monday.

Source: CSIRO Australia

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