

Insect DNA offers tiny clues about animals' changing habitats

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The long-term impact of climate change on natural communities of wild animals could be better understood thanks to a new study.

The research will help predict how migration of animals or changes to their habitats associated with climate change could impact on the evolution of relationships between predators and their prey.

Scientists have shed light on how species and their [natural enemies](#) chase each other across continents in a game of cat and mouse lasting for millions of years. They used a technique known as [population genetics](#) to reveal historical information hidden in the DNA of small plant-feeding [insects](#) and their wasp enemies, and to show how closely predators track their prey over long periods of time.

The study, involving University of Edinburgh scientists, reconstructed the evolutionary arms race between the insects and their wasp enemies. The study looked at 31 species, all of which originated in Iran and Turkey, and spread into Europe over the past four million years. The timing of each species' journey was determined by how well it coped with the many ice ages during this period of the Earth's history.

Researchers found that during these [natural cycles](#) of climate change, the plant-feeding insects often outran their predators, moving faster and so escaping attack – often for hundreds of thousands of years. Battles between predators and prey were sometimes interrupted for long periods of time, suspending the arms race between the two groups.

Scientists say relationships between species that evolve closely together can be fragile, leading to biological communities that can be easily disrupted by climate change. However, this research suggests that, at least for these insects, the predator-prey relationships are less fragile and are resistant to disruption. In addition, however, modern environments are much more fragmented than those in the past, making all natural communities more sensitive to change.

The study, carried out in collaboration with the UK Centre for Ecology and Hydrology and the City University New York, was published in *Current Biology* and supported by the Natural Environment Research Council.

Professor Graham Stone of the University of Edinburgh's School of Biological Sciences, who led the study, said: "Insects account for more than half of all animal species found on Earth. Interactions between insects, and between insects and other kinds of organism, fulfil many important biological roles – including crop pollination and pest control. We hope that our study will improve understanding of how interactions between modern species may respond to [climate change](#)."

Provided by University of Edinburgh

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