

Migrating moths and songbirds travel at similar rates

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A study published today (09 March) in *Proceedings of the Royal Society B* by researchers at Rothamsted Research (an institute of the Biotechnology and Biological Sciences Research Council), and the universities of Lund (Sweden), Greenwich and York, reports the surprising finding that night-flying moths are able to match their songbird counterparts for travel speed and direction during their annual migrations but they use quite different strategies to do so - information that adds to our understanding of the lifestyle of such insects, which are important for maintaining biodiversity and food security.

This new international study of moth migration over the UK, and songbird migration over Sweden shows that songbirds (mainly Willow Warblers) and [moths](#) (Silver Y moths) have very similar migration speeds – between 30 km and 65 km per hour – and both travel approximately northwards in the spring and southwards in the autumn.

Dr Jason Chapman, Rothamsted Research, one of the lead authors on the paper said "Songbirds such as warblers and thrushes are able to fly unassisted about four times faster than migratory moths, which might appear to be largely at the mercy of the winds. So we had assumed that songbirds would travel much faster over the same distance. It was a great surprise when we found out the degree of overlap between the travel speeds - the mean values are almost identical, which is really remarkable."

The discovery gives fresh insight into exactly how moths are able to

travel in their billions from summer breeding grounds in the UK and elsewhere in northern Europe to their winter quarters in the Mediterranean region and sub-Saharan Africa, thousands of kilometres away. This is important information in the context of declining moth populations and a critical need for pollinating insects to ensure maximum yields of food crops in the face of a potential [food security](#) crisis – the more we understand about the lifecycle and lifestyle of these insects, the better we can understand and mitigate the challenges they face for survival.

The team used specially-designed radars to track the travel speeds and directions of many thousands of individual Silver Y moths and songbirds on their night-time spring and autumn migrations.

The similarity in speed results from contrasting strategies: moths fly only when tailwinds are favourable, so gaining the maximum degree of wind assistance; whereas birds fly on winds from a variety of directions, and consequently receive less assistance. Our findings therefore demonstrate that moths and songbirds have evolved very different behavioural solutions to the challenge of moving great distances in a seasonally-beneficial direction in a short period of time.

Professor Jane Hill, who led the team at the University of York, said: "We know that many animals migrate north in spring to take advantage of summer breeding conditions in northern Europe, before returning south in winter. Given the huge differences in size and flight ability between moths and birds, we were surprised that by taking advantage of suitable winds, moths can travel so quickly.

"Migrant insects are tending to become more abundant in northern Europe, whereas many species of migrant songbirds are undergoing serious declines. These contrasting fortunes might be partly explained by the highly efficient [migration](#) strategies employed by insects that we

demonstrate in this new study."

Professor Douglas Kell, Chief Executive, BBSRC said "Insects play a number of very important roles, including the pollination of food crops and other plants. They can also be a problem, causing damage to plants that can lead to yield losses. The more we can understand about [insects](#) - how they live, reproduce, find food, become prey for other animals, and more – the better we can tackle some of the problems they both cause and alleviate."

Provided by Biotechnology and Biological Sciences Research Council

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