

Study supports theory that dragonflies migrate across the Indian Ocean

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Credit: Johanna Hedlund

Can dragonflies migrate thousands of miles across the Indian Ocean, from India via the Maldives to Africa, and back again? An international research team led by Lund University in Sweden has used models and simulations to find out if the hypothesis could be true.

In 2009, marine biologist Charles Anderson put forward a hypothesis after observing globe skimmer dragonflies (*Pantala flavescens*) on the Maldives, that had flown in from what he assumed was India. When they flew off again, it was towards East Africa. Now, 12 years later, a group of researchers decided to investigate his claim.

Globe skimmer dragonflies are too small to be fitted with transmitters. Instead, the researchers examined its physiological aspects and calculated how long a globe skimmer dragonfly could stay airborne using the energy that can be stored in its body. In addition, the researchers used meteorological [wind](#) models to determine if there are winds that can facilitate the [migration](#) in both directions.

"Our study shows that this migration from India to East Africa is actually possible. However, the globe skimmer dragonfly can't manage it using only the fat it can store in its body. It also requires favorable winds and these are present during certain periods of the year," says Johanna Hedlund, a biology researcher at Lund University.

According to the simulated migration experiments using wind models, about 15 percent of the dragonflies could manage the migration from India to Africa in the spring. In the autumn, 40 percent could make the same journey in the opposite direction.

Johanna Hedlund and her colleagues consider it impressive that dragonflies can do this at all. Even more impressive is the fact that the globe skimmer dragonfly migration across the Indian Ocean is the longest in the [animal kingdom](#) in relation to an animal's size.

"We have got a lot closer to solving the mystery of how a tiny dragonfly, which only weighs 300 milligrams, can cross 2,000 kilometers of open sea," says Johanna Hedlund.

Other animals also rely on favorable wind conditions when they migrate. Two examples are the amur falcon and the Jacobin cuckoo, which also fly across the Indian Ocean. The researchers behind the study in question warn that [climate change](#) may affect the chances of these birds and the globe skimmer [dragonfly](#) in the future. There is a risk that wind patterns will change when the [water surface](#) gets warmer.

The researchers consider that the study is important in several ways. It creates an understanding of the distances that one of the animal kingdom's smallest migrants can cover, it increases knowledge about how migratory animals can spread diseases, and it also contributes to ecosystem services at widespread locations around the world.

More information: Johanna S. U. Hedlund et al, Unraveling the World's Longest Non-stop Migration: The Indian Ocean Crossing of the Globe Skimmer Dragonfly, *Frontiers in Ecology and Evolution* (2021). [DOI: 10.3389/fevo.2021.698128](https://doi.org/10.3389/fevo.2021.698128)

Provided by Lund University

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