How variation in body size correlates with en-route migration performance in a long-distance migratory songbird?

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Researchers relate migration performance to body and wing size in migratory songbirds. The original article "The influence of morphological variation on migration performance in a trans-hemispheric migratory songbird" is available to read and download fully in open access on De Gruyter Online.

Every spring and fall, migratory songbirds around the world make epic journeys from their breeding to their wintering grounds. Ornithologists have long known that not all birds travel at the same speed during the treks, as some individuals tend to stay longer at stopover sites than others. The reason for the varying stopover lengths has usually been attributed to differences in feeding rates. Now, a team of Canadian researchers from the University of Manitoba has determined there is another, very surprising, reason why some birds stay longer at stopover sites than others. In an article, just published in Animal Migration, they conclude that, apparently, it is the physical structure of the birds that determines their performance.

The researchers, led by Lawrence Lam from the University of Manitoba, studied the migrations of individual Purple Martins - small songbirds related to swallows, known for colonial-nesting in Martin houses and hollowed-out gourds. They placed tiny tracking devices (light-level geolocators) on 120 martins from 10 different breeding sites across North America and then recaptured them after the birds had completed

their migration. The devices not only provide information on where the birds go during their northward and southward journeys, but they also tell, how long they stay at stopover sites on route.

Eager to determine if body or wing size played role in the migratory rates of the martins, the scientists collected detailed measurements of each bird before they released it. They then compared the birds' individual body measurements against the number and duration of their stopover periods during the fall and spring migrations. Their analyses demonstrated that larger-bodied birds tend to stay longer at stopover sites during fall migration, but during spring the larger birds actually have shorter and fewer stopovers. In other words, the individual variation in stopover length is influenced by the size of the bird, and by the size of its wings.

"As far back as the late 1800's, researchers noticed that migratory birds differed in size and shape than non-migratory birds, and they suggested that these features may be beneficial to migrants" comments Dr. Melissa Bowlin of the University of Michigan-Dearborn, who also utilizes tracking technologies in her research of migratory flight performance. Now we know "that smaller-bodied birds were able to migrate faster in autumn," she adds. "While this is just a first step, analyses such as these should allow us to tease apart the effects (if any) of some of the morphological variables that have been associated with migration for so many years."

It is yet unclear, if these findings apply to other long-distance migrants, but the current results already pave the way for future investigations on the linkages between physical characteristics and migration performance. The authors recommend that, when studying the migration ecology of long-distance migratory birds, researchers should include information regarding how foraging ability and other factors may impact migratory performance.

"A lot of researchers are now using geolocators to track bird migrants," says Andy Davis, Editor-in-Chief of Animal Migration, "but this study is the first to combine migration tracking information with individual flight characteristics, and it shows these things are related."

More information: The influence of morphological variation on migration performance in a trans-hemispheric migratory songbird; Animal Migration; DOI: 10.1515/ami-2015-0005

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