During epic migrations, great snipes fly at surprising heights by day and lower by night

June 30 2021

A great snipe in flight, with a mountain in the background. Credit: Åke Lindström

Don't let the great snipe's pudginess fool you. A stocky marsh bird with a 20-inch wingspan, great snipes are also speedy marathoners that can

migrate from Sweden to Central Africa in just three days, without even stopping to eat, drink, or sleep. Now, researchers find that the snipes also rise nearly 2,500 meters in elevation at dawn and descend again at dusk each day, perhaps to avoid overheating from daytime solar radiation by climbing to higher, cooler altitudes. The findings appear June 30 in the journal *Current Biology*.

The birds also spent much more time in higher elevations than previously thought: during its migration, one bird flew at nearly 8,700 meters (almost as high as Mount Everest) for five consecutive hours, which may be the highest altitude ever recorded for a tracked migrating bird.

"Anyone who studies animal behavior will often find that there is huge variation between individuals. But these birds almost do the exact same thing," says lead author Åke Lindström, a professor in the biodiversity department at Lund University in Sweden. "In the great snipe's migration pattern, we found a very, very strong diel cycle—higher at day, lower at night. They seem to have found a behavior that's really optimal for them."

The great snipes are no strangers to long flights, flying 6,000 kilometer nonstop from breeding grounds in Sweden to Africa's Sahel region for a monthlong stopover in autumn, traveling 1,500-3,000 kilometers within Africa to their final wintering grounds, and migrating 5,200 kilometers back to Southeast Europe in the spring. But until now, scientists have only been able to get a sneak peek of the birds' journeys.

A snipe sitting with nets being raised in the background. Credit: Åke Lindström

Previous research tracked the birds only when they passed in range of radar, so scientists commonly assumed that the snipes—and many other birds—maintained a steady, favorable cruising altitude to minimize energy loss. But thanks to new technology, scientists can now track birds throughout their entire migration.

In this study, Lindström and his team attached mini data-loggers, weighing only about 1% of the birds' total body mass, to the legs of 14 snipes. The loggers recorded measurements on activity, air pressure, and temperature every hour during their flights.

The researchers found a distinct pattern in all three seasonal migrations. After a night at moderate to high altitudes, the birds ascended to very high altitudes at dawn, stayed at those high altitudes during the day, and descended again in late afternoon or evening to heights similar to the previous night. The snipes typically flew at about 1,600-2,100 meters above sea level at night and 3,900-4,500 meters above sea level during the day.

But why the snipes change their elevation depending on time of day remains an unanswered question. Wind conditions or speed, which are usually the primary factors that influence migration, do not consistently change between day and night. The presence of the sun, however, does—leading to three possible explanations.

A great snipe sitting. Credit: Åke Lindström

First, although flying higher in daylight could help the snipes find landmarks, migratory birds are known to be excellent navigators that don't need to rely on the physical landscape for directions. Higher elevation during the day could also help the snipes escape the range of birds of prey that hunt during the daytime.

But the most likely reason for this daily elevation change comes from the sun's warmth. When flying, the great snipes flap their wings seven beats per second, generating large amounts of body heat. At night when temperatures are cooler, this isn't a problem. But during the daytime, the sun's rays most likely increase their body temperature even more. "When the sun comes up, there is also solar radiation to consider: imagine the difference in temperature when you sit in the shade versus when you sit in the sun," explains Lindström.

Flying more than 2,000 meters higher during the day, where the air is 13 degrees Celsius (55 degrees Fahrenheit) cooler, therefore, might help the birds keep from overheating. But the snipes also ascended farther than the researchers had ever expected. They repeatedly reached heights of over 6,000 meters, and one bird flew at nearly 8,700 meters—only about 150 meters lower than the summit of Mount Everest. Though conditions above 8,000 meters are brutal for humans, the great snipes seemed to have it figured out.

"They are already way ahead of humans in terms of lung capacity and supplying muscles with oxygen," Lindström says. "If you asked the average great snipe how and why they can fly so high, and if they could

answer, they'd probably just be surprised by the question. They wouldn't understand that they have done anything special."

More information: *Current Biology*, Lindstrom et al.: "Extreme altitude changes between night and day during marathon flights of Great Snipes." www.cell.com/current-biology/f … 0960-9822(21)00745-4 , DOI: 10.1016/j.cub.2021.05.047

Provided by Cell Press

Citation: During epic migrations, great snipes fly at surprising heights by day and lower by night (2021, June 30) retrieved 24 April 2024 from https://phys.org/news/2021-06-epic-migrations-great-snipes-heights.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.