Birds must choose between mating, migrating, study finds

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Two adult male White-ruffed Manakins are shown here perched above their lek at Rara Avis, Costa Rica. Credit: David Vander Plyum

Sex or nice weather. That's the agonizing choice some birds face, according to a new University of Guelph study.

A team led by Guelph researchers discovered that for some male birds traveling to areas with lighter rainfall comes at the cost of attracting a female when they return home.

Alice Boyle, a former U of G post-doc, Prof. Ryan Norris and Prof. Chris Guglielmo, a biologist at the University of Western Ontario,

examined the breeding behaviour of the white-ruffed manakin. This small Costa Rican bird is partially migratory, choosing each year whether to migrate or stay.

During the heavy rainy season some Manakins will migrate to lower elevations where the lighter rainfall makes it easier to forage for food.

The researchers discovered the males that choose to stay behind may gain better breeding sites and are more likely to increase or maintain their standing within the population, making them more attractive to females.

"The manakins are faced with the choice of boosting their chances of survival or boosting their chances of breeding," said Norris, an integrative biology professor. "Most animals migrate because of the cold but in the tropics you see some populations that are partially migratory. These species provide a window into the evolution of migrating and a unique opportunity to examine the costs and benefits of this behaviour."

The study published today in *Biology Letters* is the first to investigate costs and benefits of staying or going in a partially migratory species.

During two breeding seasons, the researchers tagged almost 200 birds to observe their status and mating success. Alpha males in the population often have the most prominent breeding sites and perform the most elaborate aerobatic displays to attract the females.

To learn which birds had migrated or not before the breeding season, the scientists tested samples of their claws. Migrating birds have more heavy hydrogen in their claws. Rain at the lower elevation contains more of these isotopes, which end up in plants and berries eaten by the manakins, said Norris.

"These isotopes of hydrogen then become fixed in their nails," he said. "The problem with studying migration is that it's hard to follow the animals around, but this method allowed us to go back in time to find out what the bird was doing before we captured it."

The researchers found that males that did not migrate had better breeding sites, a higher status and attracted more females than the migrating males.

Choosing to stay or go is likely based on a number of factors, said Boyle.

"Birds that are younger are more likely to migrate because they still have several years of breeding opportunities ahead of them," she said. "It's often the older birds with a higher status that stay not only because there is a sense of urgency to breed but also they know staying will improve their chances of becoming an alpha."

Migrating birds are often in poorer condition and less likely to survive the heavy rains, said Boyle. They also aren't next in line to becoming an alpha so they won't be losing out on the opportunity if they leave, she added.

"These factors can change from year to year which is why we see these birds choose different options each year. They have to decide what makes the most sense for them based on their status and condition."

More information: rsbl.royalsocietypublishing.or … .1098/rsbl.2011.0115

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