Going viral: Why Canadian sparrows have changed their tune

Study finds British Columbia birds' dropped-end note of call has spread across country

The white-throated sparrow of North America

AFP | Toronto

Members of a Canadian sparrow species famous for their jaunty signature song are changing their tune, a curious example of a "viral phenomenon" in the animal kingdom, a study showed Thursday.

Bird enthusiasts first recorded the white-throated sparrow's original song, with its distinctive triplet hook, in the 1950s.

Canadians even invented lyrics to accompany the ditty: "Oh my sweet, Ca-na-da, Ca-na-da, Ca-na-da."

But starting from the late 20th century, biologists began noticing that members of the species in western Canada were innovating.

Instead of a triplet, the new song ended in a doublet and a new syncopation pattern. The new ending sounded like "Ca-na, Ca-na, Ca-na."

Over the course of the next two decades, this new cadence became a big hit, moving eastward and conquering Alberta, then Ontario. It began entering Quebec last year.

It's now the dominant version across more than 2,000 miles (3,000 kilometres) of territory, in an extremely rare example of the total replacement of historic bird dialect by another.

Scientist Ken Otter at the University of Northern British Columbia, and his colleague Scott Ramsay from Wilfrid Laurier University, described the dizzying pace of this transformation in the journal Current Biology.

"What we're seeing is like somebody moving from Quebec to Paris, and all the people around them saying, 'Wow, that's a cool accent' and start adopting a Quebec accent," Otter told AFP.

Their work was based on 1,785 recordings between 2000 and 2019, the majority made by them but with contributions from citizen-scientists, who posted the files on specialist sites like xeno-canto.org.

In the western province of Alberta, about half of the recorded songs ended with the triplet in 2004; ten years later, all the males had adopted the doublet.

In 2015, half of western Canada had converted to the doublet version, and by last year, the new song had been well established on the western tip of eastern Quebec province.

At this rate, the historic triplet version may soon exist only in tape recordings.

Geolocator's light stalk center sticking out through the white-throated sparrow's feathers

Bird influencers

The males of the species sing to mark their territory, and their songs all share a common structure. Usually, if a variation appears, it remains regional and doesn't make headway in neighbouring territories.

The study represents the first time scientists have been able to show this kind spread at huge geographic scale, said Otter.

So how did it happen?

Probably in the same way that children return from summer camp humming new tunes: songbirds from different parts of Canada winter in the same parts of the United States, then return to their own homes in spring.

The researchers verified this theory by tagging a few of the birds.

So it was that in the plains of Texas and Kansas, the new song's first adopters from western Canada -- avian influencers, if you will -- popularized the trend among their eastern brethren.

Previous work has shown that young birds can pick up a foreign song after listening to a recording.

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> KEN OTTER

But to truly understand why the males were willing to abandon the old song that had once served them well, the scientists have to rely on theories.

Otter believes it may be because females were more attracted to the new song, so young males rushed to adopt it.

"There seems to be some advantage to adding novel elements into your song that make the song, not necessarily more attractive, but increases people's attention to it," said Otter.

Going back to the human example, it would be akin to "if all the French women in Paris thought that a Quebec accent sounded much more interesting than a Parisian accent, and so everybody starts adopting a Quebec accent."

The hypothesis remains unverified.

Prehistoric ochre mining operation found in submerged Mexican caves

Reuters | Washington

Diver examines an ochre extraction pit in the mine

Researchers diving into dark submerged caves on Mexico's Yucatan Peninsula have found evidence of an ambitious mining operation starting 12,000 years ago and lasting two millennia for red ochre, an earth mineral pigment prized by prehistoric peoples.

More than 100 dives totaling more than 600 hours in Quintana Roo state turned up numerous mining artifacts, the scientists said on Friday. These included ochre extraction pits, digging tools like hammerstones and small piledrivers made of stalagmites, markers that helped the miners navigate the extensive cave network and hearths used to provide light. The caves were not underwater at the time of the mining.

The mining was undertaken as human populations first spread through the region. The caves subsequently were abandoned for millennia before becoming submerged roughly 8,000 years ago amid rising sea levels after the last Ice Age.

Researchers previously had found human skeletons in the caves but had not identified why people were there.

"Across the world, archaeological evidence has shown that humans have been using ochre for hundreds of thousands of years. Even Neanderthals used ochre," said University of Missouri archaeological scientist Brandi MacDonald, lead author of the research published in the journal Science Advances.

Ochre is believed to have offered uses including painting objects and bodies, mortuary practices and perhaps hide tanning.

The dive team explored about 4.3 miles (7 km) of subterranean passages in three separate cave systems, with mining spanning more than a half-mile (900 meters).

"It is pretty electrifying to be the first people to enter into an area that has not seen humans for thousands of years and to see what they left behind," said study co-author Sam Meacham, founder of El Centro Investigador del Sistema Acuífero de Quintana Roo A.C. (CINDAQ) and co-discoverer of the mines.

Monkeys with coronavirus developed short-term immunity

AFP | Washington

Test monkeys infected with the novel coronavirus responsible for the COVID-19 pandemic were protected from reinfection for up to 28 days later, a Chinese study out Thursday in the journal Science said.

While the monkeys displayed initial immunity, it's unclear how long such immunity will last in humans - it will be necessary to wait months, or even years, to know if the millions of people infected at the start of the pandemic are protected from re-infection.

Scientists from Peking Union Medical College performed an experiment on rhesus macaques, often used because of their similarities to humans, to find out if they have a short-term immunity to the virus.

Six rhesus macaques were infected in their trachea with a dose of the SARS-CoV-2 virus. They developed mild to moderate symptoms, and took about two weeks to recover.

Twenty-eight days after the first infection, four of the six monkeys received another dose of virus, but this time, despite a brief rise in temperature, they showed no sign of reinfection, the study authors wrote.

By taking frequent samples the researchers discovered that the peak viral load was reached three days after the monkeys were infected.

The monkeys showed a stronger immune response after the first infection, producing more so-called neutralizing antibodies which may have protected them against short-term reinfection, the scientists wrote.

More experiments are needed to see how long this immune defense remains, the authors said.