Tropical bananaquits lose song quality in the city

September 21 2021

Credit: Leiden University

I think we should go this way. This way! THIS! WAY!! Making yourself heard in a city can be difficult. That is not only the case for humans, but birds seem to be hindered by urban noise as well. Researcher Hans Slabbekoorn of Leiden University already showed that great tits in Leiden communicate differently at noisy crossroads compared to quiet neighborhoods. Now, it has become clear that also tropical bananaquits adjust their songs to frequencies above the city's traffic noise.

After guest lectures in Brazil, Slabbekoorn was approached by Gabrielle

Winandy. "She wanted to investigate if the effect of city sounds on Dutch great tits could be translated to the tropics with her PhD research," Slabbekoorn explains. "That would be unique research and made it interesting." Winandy did the fieldwork in Brazil and then came to Leiden to turn the data into two companion papers at the Institute of Biology Leiden.

Silence and noise

The songbird bananaquit was the star of the research. Winandy made recordings of their song throughout the Brazilian city of Salvador, in both noisy and quiet areas. "And those were scattered within the city," Slabbekoorn explains. "For example, on one side of the building, there was a bustling traffic point, while on the other side there was a peaceful park."

In noisy areas, the sounds of the bananaquits proved to be significantly different. Changes such as raising the frequency made their songs better audible against the low frequencies of the city's background noise, but simultaneously diminished the birds' song quality. The bananaquits sang higher notes, but additionally, their songs were also shorter, more repetitive, and less diverse.

Cry for attention

"As is the case with our great tits, this affects how the bananaquits communicate with their peers," Slabbekoorn notes. "Their song may reach far despite noisy conditions, but the altered songs may have less effect. That means that the bananaquits would have to spend more time defending their territory and spend more energy to attract a partner. Consequently, less time and energy is left to look for food."

Winandy also confirmed that the adjusted song changed their communication, by playing the recorded sounds to other bananaquits. These birds reacted significantly different to the played variation, which proved its functional relevance in the natural context. "This is another clear example of how human noise not only influences what birds sing, but also what they communicate, across the world," Slabbekoorn concludes.

The research was published in *Frontiers in Ecology and Evolution*.

More information: Gabrielle S. M. Winandy et al, Urban Noise Restricts Song Frequency Bandwidth and Syllable Diversity in Bananaquits: Increasing Audibility at the Expense of Signal Quality, *Frontiers in Ecology and Evolution* (2021). DOI: 10.3389/fevo.2021.570420

Gabrielle S. M. Winandy et al, Noise-Related Song Variation Affects Communication: Bananaquits Adjust Vocally to Playback of Elaborate or Simple Songs, *Frontiers in Ecology and Evolution* (2021). DOI: 10.3389/fevo.2020.570431

Provided by Leiden University

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