

## Traffic noise makes mating crickets less picky

February 1 2021



Female cricket (Gryllus bimaculatus) approaching male. Credit: Dr Adam Bent

A new study shows that the mating behaviour of crickets is significantly affected by traffic noise and other man-made sounds—a finding that could have implications for the future success of the species.



The research, published in the journal *Behavioral Ecology*, was carried out at Anglia Ruskin University (ARU), and involved studying the mating choices of female field crickets (Gryllus bimaculatus) under different acoustic conditions.

When a female cricket is nearby, male crickets will perform a courtship song by rubbing their wings together. The song is energetically costly to produce and so contains important information about the male's qualities. Therefore, it would be taken into account by females when making mating decisions.

The researchers paired female crickets with silenced male crickets in ambient <u>noise</u> conditions, artificial <u>white noise</u> conditions, and traffic noise conditions (recorded at a ground level next to the A14 near Cambridge).

Males were then allowed to court the female freely, and an artificial courtship song was played back when the males attempted to sing. Males were either paired with a high-quality courtship song, a low-quality courtship song, or no song at all.

In the control conditions of ambient noise, the females mounted the males much sooner and more frequently when paired with a high-quality courtship song. However, a high-quality courtship song provided no benefit in the white noise and traffic noise conditions, with the researchers finding that courtship duration and mounting frequency were not influenced by the quality or even the presence of a song.

The findings suggest that man-made noise alters how females perceive males when making mate choice decisions. In turn, this could affect individual fitness, as male crickets may attempt to expend more energy to produce an even better courtship song, as well as long-term population viability.



Lead author Dr. Adam Bent, who carried out the study as part of his Ph.D. at Anglia Ruskin University (ARU) in Cambridge, England, said: "In the short-term, we found that males paired with high-quality songs in noisy environments are receiving no benefit over those paired with a lowquality song, or no song at all. As a result, <u>males</u> that produce highquality songs may attempt to expend more energy into their calls to gain an advantage, potentially affecting that individual's survival.

"At the same time, female crickets may choose to mate with a lowerquality male as they are unable to detect differences in mate quality due to the man-made noise, and this may lead to a reduction or complete loss of offspring viability.

"Traffic noise and the crickets' <u>courtship</u> song do not share similar acoustic frequencies, so rather than masking the <u>courtship song</u>, we think the <u>traffic noise</u> serves as a distraction for the female <u>cricket</u>."





Female cricket (Gryllus bimaculatus) mounting male. Credit: Dr Adam Bent

Co-author Dr. Sophie Mowles, Senior Lecturer in Animal and Environmental Biology at Anglia Ruskin University (ARU), said: "Humans are continually changing the characteristics of environments, including through the production of anthropogenic noise.

"As mate choice is a powerful driving force for evolution through sexual selection, disruptions may cause a decline in population viability. And because anthropogenic noise is a very recent evolutionarily selection pressure, it is difficult to predict how species may adapt."

More information: Behavioral Ecology (2020). DOI:



## 10.1093/beheco/araa124

## Provided by Anglia Ruskin University

Citation: Traffic noise makes mating crickets less picky (2021, February 1) retrieved 28 April 2024 from <u>https://phys.org/news/2021-02-traffic-noise-crickets-picky.html</u>

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