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PROJECT

Cricket Scores: Singers and Listeners (A Tinbergian Synthesis of Cricket and Katydid Acoustic Communication)

Crickets and katydids are among the oldest terrestrial insects to have evolved acoustic communication for mate-finding. They show a bewildering diversity of signals and mate-finding strategies, across and within species and communities. My work tries to understand why signals are structured the way they are, when and where animals signal, and what drives these decisions. Equally important are decisions that receivers make based on these signals, on whom to approach or avoid, when, how, and whether to search for mates. I have examined these questions using a variety of approaches, from understanding the physics and physiology of signalling to the influence of immediate ecological context and evolutionary history. I have also examined the fitness consequences of these decisions. The empirical data have yielded many unexpected results, challenging some common assumptions in the area of animal communication. In this project, I would like to synthesise these findings on signalling and decision-making in the form of a book placed in the wider perspective of the field of animal communication. I believe that there is necessity at this point for a deeper reflection on the entrenched assumptions and approaches to the study of animal communication, how these limit our understanding, and how we may move forward. This is of particular significance when trying to understand anthropogenic impacts on animal communication. This book will also examine more broadly the historical trajectory of animal behaviour research and how anthropomorphism and human perception may have biased this trajectory.

Recommended Reading

Jain, Manjari, Swati Diwakar, Jimmy Bahuleyan, Rittik Deb, and Rohini Balakrishnan (2014). “A Rain Forest Dusk Chorus: Cacophony or Sounds of Silence?” Evolutionary Ecology 28: 1–22. https://doi.org/10.1007/s10682-013-9658-7.

Raghuram, Hanumanthan, Rittik Deb, Diptarup Nandi, and Rohini Balakrishnan (2015). “Silent Katydid Females Are at Higher Risk of Bat Predation than Acoustically Signalling Katydid Males.” Proceedings of the Royal Society B 282: 20142319. https://doi.org/10.1098/rspb.2014.2319.

Deb, Rittik, Sambita Modak, and Rohini Balakrishnan (2020). “Baffling: A Condition-Dependent Alternative Mate Attraction Strategy Using Self-Made Tools in Tree Crickets.” Proceedings of the Royal Society B 287: 20202229. https://doi.org/10.1098/rspb.2020.2229.

COLLOQUIUM, 03.12.2025

Cricket Songs: Singers and Listeners

Crickets are singing insects and the first known terrestrial animals to communicate using sounds. Male crickets sing to attract females of their species as potential mates. Females are silent but hear, recognize, and navigate towards male songs from a distance. In addition to females of their species, cricket songs have attracted the attention of eavesdropping predators, as well as humans. Humans have engaged with crickets over centuries in a cultural context and, more recently, with them as subjects of scientific inquiry. I will summarize my preliminary findings and thoughts on human-cricket interactions in the cultural context and then move on to a couple of scientific case studies from my work on the how and why of acoustic communication in crickets. I will describe my findings on the relative predation risk of singing males versus silent, searching females in the broader context of examining what determines the roles that males and females assume during mate-finding. In the second case study, I will discuss how crickets communicate effectively in noisy environments and the role that senders, receivers, and the messages themselves play in achieving clear, unambiguous communication. I will end with some illustrative examples of how crickets, with their small brains, solve complex computational problems and exhibit sophisticated behaviours commonly associated with larger vertebrates.

PUBLICATIONS FROM THE FELLOW LIBRARY

Balakrishnan, Rohini (London,2025)

Acoustic monitoring for tropical insect conservation

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=193962049X

Balakrishnan, Rohini (Berlin,2023)

Is flying riskier for female katydids than for males?

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1939613345

Balakrishnan, Rohini (London,2023)

Multimodal duetting in karydids under bat predation risk : a winning strategy for both sexes

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1939610273

Balakrishnan, Rohini (Lausanne,2022)

Ecological constraints on sexual selection in a human-modified landscape

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1939587069

Balakrishnan, Rohini (Cambridge,2021)

Acoustically eavesdropping bat predators take longer to capture katydid prey signalling in aggregation

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1939609291

Balakrishnan, Rohini (London,2020)

Baffling : a condition-dependent alternative mate attraction strategy using self-made tools in tree crickets

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=193132123X

Balakrishnan, Rohini (Basel,2017)

Tree crickets optimize the acoustics of baffles to exaggerate their mate-attraction signal

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=104079534X

Balakrishnan, Rohini (Berlin,2015)

Ecology of acoustic signalling and the problem of masking interference in insects

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1939615976

Balakrishnan, Rohini (Cambridge,2015)

A novel acoustic-vibration multimodal duet

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1939584868

Balakrishnan, Rohini (Oxford,2014)

The opportunity for sampling: the ecological context of female mate choice

https://kxp.k10plus.de/DB=9.663/PPNSET?PPN=1939624282