

Abstract

Birdsong is one of the most fascinating communication tools in the animal kingdom, whether it is used for attracting a mate or in territory defense. In my dissertation, I present evidence that we can successfully study the role of birdsong in territorial behaviour, its seasonal variability, and ultimately its role in evolutionary processes thanks to modern bioacoustic and ecoacoustic approaches.

By combining the bioacoustic approach with molecular analyses, I demonstrate that in the model system of two closely related passerine species, the heterospecific song convergence in their secondary contact zone is based on cultural transmission, and not on interspecific hybridisation and/or gene introgression.

My dissertation further extends into the tropical zone, which is generally characterized by less pronounced environmental seasonality compared to the temperate zone. The study of potential seasonality in singing activity and the proportion of vocalizing species in this zone therefore requires year-round monitoring, which is possible thanks to the quite recent development of automated recording units (ARU). First, we confirmed that using ARU provides very similar estimates of community composition, species richness, and abundance to traditional field methods (point counts) in the specific conditions of a tropical forest environment.

This allowed me to further study the seasonality in vocal activity patterns of bird species community in the lowland rainforest of Mount Cameroon. I provide interesting evidence that the singing activity and number of species varies significantly in line with the seasonality of rainfall throughout the year and that species turnover in singing activity is highest during the transition periods between the dry and rainy seasons.

My dissertation provides one of the first evidence of year-round distinct seasonality patterns in bird vocal activity in the Afrotropics. I conclude that relatively low-cost, non-invasive, and objective bioacoustic approaches and monitoring are effective in ecological and evolutionary research on bird species in both temperate and tropical ecosystems.