FACULTY RESEARCH FUND

Award Date: Fall 2021

Proposal Title: Islands within islands: Correlated genetic structure between mainland and Caribbean populations of common ground-doves and their parasitic lice

Principal Investigator: Andrew Sweet

College of Science and Mathematics

Department of Biological Sciences

ABSTRACT

Oceanic islands are important systems for understanding biodiversity. As organisms move among different islands, they can quickly become genetically distinct and undergo rapid adaptations to their new environments. However, there are still many unanswered questions about the link between island ecology and biodiversity, particularly regarding the coevolution of hosts and their parasites. I am specifically interested in addressing two questions: **1) how does host dispersal (movement among islands and the mainland) affect the biodiversity of their parasites? and 2) do parasites provide information about the direction of historical movements of their hosts among different islands and the mainland?** To this end, I propose to initiate a study focused on the population genetics of common ground-doves and their parasitic lice. The doves are widespread in the Neotropics, including several subspecies on different Caribbean islands. The doves also host two different types of parasitic lice, which are small insects that eat feathers and skin. For my study, I will sequence the genomes of common ground-doves from different mainland and Caribbean populations. I will also obtain genomic data from both types of parasitic lice, which were collected from doves on the mainland (United States, Central America, and South America) and the Bahamas. All dove and louse samples will be obtained from existing biological collections. To address my questions, I will use these genomic data to reconstruct the evolutionary histories and population structure of the doves and their lice. This project will also involve undergraduate students from A-State, who will be instrumental in helping with molecular lab work and bioinformatics. The results from this study will be published in peer-reviewed journals and presented at national scientific conferences. This seed project will also generate preliminary data for larger funding opportunities, specifically through the National Science Foundation's Division of Environmental Biology.