Public Abstract

First Name:Alfred

Middle Name:Thomas

Last Name:Leak

Adviser's First Name:Richard

Adviser's Last Name:Houseman

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:SP 2010

Department:Plant, Insect and Microbial Sciences

Degree:PhD

Title:COMPARING MOSQUITO COMMUNITIES OF VARIOUS PATCH-MATRIX LANDSCAPE COMBINATIONS IN CENTRAL MISSOURI, WITH IMPLICATIONS FOR DEVELOPING MODELS TO FORECAST ABUNDANCES OF IMPORTANT MOSQUITO TAXA

It is well understood that mosquitoes represent one of the most consequential arthropod vectors of disease in humans and animals. The importance of the pathogens that can be transmitted by these insects is difficult to overstate. Even in the absence of vector status, their presence and abundance in a wide variety of landscapes utilized by man can lead to annoyance, apprehension, and abandonment of planned activities. It is for these reasons that surveys of the numbers and types of mosquitoes present in given areas at a given time are undertaken.

Disease vector population densities, combined with their relationship to landscape characters, will clearly affect the proliferation of arboviruses to humans present in these landscapes. Modeling produced from mosquito abundance and environmental factor data has been used to create disease outbreak early warning systems.

Advanced mapping techniques (e.g., GPS, land cover surveys) allow for the characterization of specific locations with regard to landscape, ecological matrix, and the presence of patches of different land cover types within matrices. Thus, coupling biological sampling for mosquito vectors of disease with certain environmental conditions within different landscape configurations may help approximate a model for predicting the risk of encountering these disease vectors.

Therefore, the goals of the research described in this dissertation were 1) to describe the mosquito fauna of the various patch-matrix landscape combinations common in five central Missouri counties; 2) to evaluate the temporal occurrence of these mosquito taxa; 3) to assess relationships between regional weather factors and the occurrence and abundance of the mosquito fauna; and 4) to categorize the risk of encountering mosquito vectors of disease based on patch-matrix landscape configurations, temporal mosquito abundance and diversity, and weather data.