

WIU CENTENNIAL HONORS COLLEGE
Thomas E. Helm Undergraduate Research Day 2023

Abstract

Poster

Major: Biochemistry

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**Creating a Standard of Comparison for Nymph and Larval Tick Identification Utilizing
Glutaraldehyde Fixation and Scanning Electron Microscopy**

Katie Kanaan

During the first week of August for the past 10 years, Sherman traps were set at various transects at Kibbe wildlife station in order to capture *Peromyscus leucopus*, or the white-footed mouse. The mice were subsequently dissected for ectoparasite and endoparasite collection and statistical analysis. Ticks of larval and nymph life stages are found on mice, and there are four different species found in the area: *Amblyomma americanum*, *Dermacentor variabilis*, *Ixodes scapularis*, and *Rhipicephalus sanguineus*. However, there is no set standard of comparison for identifying the ticks that are found. It is hypothesized that, by imaging known reference species and life stages of ticks via a scanning electron microscope, the ectoparasites that were collected can be compared to the reference images and identified for analysis of species and life stage prevalence. To prepare the reference species for scanning electron microscopy, each sample went through a 10-hour chemical procedure in order to fixate them. During this procedure, the cell walls were fortified and fixated, and all volatile materials were removed. This was done to prevent collapse of the samples during the pressure change and to prevent the volatile materials from bursting through the cell walls. The samples were then sputter coated and imaged at specified magnifications to create the standard of comparison.