The aim of this research is to study the mammalian decomposition rates in the presence of fungi native to the New Jersey Pine Barrens. This research is significant because it provides information regarding fungal interactions within decomposition in areas of acidic soil. Because biological processes are different depending on location and environmental factors, this provides a basis for New Jersey and the eastern side of the United States regarding fungal interaction and how it can affect total body score (TBS) interpretation which affects postmortem interval (PMI) calculations. The specific research questions of this study are: How does fungal species interact in mammalian decomposition? Does the presence of these fungi accelerate the decomposition process? How does decomposition compare between burial in a soil matrix and surface deposition? And does a soil matrix accelerate or inhibit decomposition? It is hypothesized that in the presence of fungi the mammalian specimens will decompose at an accelerated rate compared to a sterile soil matrix and compared to surface deposition.

Soil derived from the New Jersey Pine Barrens was used for this study as was fungal species specific to this environment. As cited in various scientific articles, the main area of fungal focus during decomposition is ammonia metabolizing fungi and/or keratinase metabolizing fungi [1, 2]. For this study, keratinase metabolizing fungi that can be found in the New Jersey Pine Barrens was chosen, in particular: Fusarium oxysporum, Trichoderma viride, and Chrysosporium keratinophilum [3,4,5]. The soil used for the study was dug up from a wooded area in Winslow Township, New Jersey. The soil consisted of soil horizons O, A, and B mixed together to simulate the burying of a body. The mammalian specimens chosen for the study were mice. In particular, thirty mice were chosen and split into five categories and given a subject number: negative control one, negative control two, positive control, specimen species one, specimen species two, and specimen species three. Negative control one were mice left unburied to simulate surface deposition. Negative control two were mice in sterilized soil. Positive control were mice in unsterilized soil. Specimen species one were mice in Fusarium oxysporum inoculated soil. Specimen species two were mice in Trichoderma viride inoculated soil. And specimen species three were mice in Chrysosporium Keratinophilum inoculated soil. Decomposition of the mice was documented on days 0, 3, 6, 9, 13, 20, and 30. Documentation includes the weight of each subject number to track loss of mass, the soil pH, and TBS. Results of the study showed that the fungi did have an impact on the decomposition process.

This research will greatly benefit the forensic community by allowing crime scene investigators to have more available methods for detecting bodies and pathologists to determine time of death. Research such as this has been sought out throughout the forensic and mycology fields. Authors such as M. Tibbett and D.O. Carter have stated in their book Soil analysis in forensic taphonomy: “We hope mycologists and forensic scientists will collaborate to take the concept of forensic mycology forward into an accomplished and effective forensic science tool.” [1]