

Bacterial Succession During Decomposition

Proposal

In recent years, forensic biology has changed the field of criminal justice, from the application of entomology to DNA analysis. While these specializations have been standardized, relatively little research has been done to understand the application of microbiology to crime scene investigations. To fill that void, this project investigated the succession of bacterial communities on pig cadavers over 24-hour increments for the course of 7 days. Initially, two pig cadavers were placed in separate cages to decompose under natural conditions. Samples were collected by swabbing the mouths, ears, cheeks, noses, and genitals of pigs, and the swabs were placed in separate paper wrappings to be returned to the laboratory for analysis. Bacteria collected from the various anatomical structures were isolated on nutrient agar and identified using classic microbiological techniques as well as 16S ribosomal RNA (16S rRNA) sequencing. Several different phyla were identified initially (Time 0), including many genera associated with the human microbiome. However, over the course of 7 days, various microbial families and genera increased in numbers while many other microbial communities experienced a numerical decline, suggesting that a pattern may exist during the decomposition process. Such information may have great implications for crime scene investigations, particularly when determining the post mortem interval (PMI).