



### **D35 The Recovery of DNA in Indoor and Outdoor Area Environments**

*Paris F. Favorite, BS\*, 4434 S Loop 289, Lubbock, TX 79414; Kathy L. Sperry, PhD, 4434 S Loop 289, Lubbock, TX 79414; and Cynthia Lopez, MS, 4344 S Loop 289, Lubbock, TX 79414*

---

After attending this presentation, attendees will have an understanding of how scientific techniques such as Polymerase Chain Reaction (PCR) are used in detecting the presence of pig (*Sus scrofa*) mitochondrial DNA collected from intestines of maggots.

This presentation will impact the forensic science community by identifying how environmental factors can influence postmortem changes and affect the presence of DNA on remains. In order to further explore the effects of indoor and outdoor areas, the decomposition and insect colonization of pig carcasses will be observed over a 42-day period in a semi-arid environment located at Research Site located in Lubbock, TX.

The focus of the study is to analyze samples collected from the intestines of early in-star maggots used to identify the presence of pig (*Sus scrofa*) DNA in decomposed remains placed in an open-air environment and in an enclosed environment. This study hypothesizes that the amount of DNA recovered will vary significantly between the two environments.

This study involves two female pigs that are being used as an animal model for human victims, suspects, or third-party suspects for forensic investigations. Deoxyribonucleic acid sequence data will be obtained from the intestines of maggots that feed on pig remains. Deoxyribonucleic acid has become standard in forensic science to analyze biological samples from decomposed remains. In addition, DNA serves as an essential tool for the identification of humans.

Two juvenile female pig carcasses weighing approximately 15kg will be placed at Research Site; one will be placed inside a wooden house and the other will be placed outdoors in a field. Observations and sample collection from the pig carcasses will be conducted daily. Blowfly (*Calliphoridae*) larvae (maggots) will be collected in late summer and the intestines of the insects will be analyzed to determine the amount of DNA present. The characteristics of a semi-arid environment are such that developmental growth of maggots may be impeded, consequently having a possible influence on the amount of DNA recovered. Maggots will be collected and preserved in 15ml falcon tubes filled with 5-10ml of 70% ethanol. All larvae samples collected will be placed in a freezer at 4°C to improve preservation of the DNA in maggots and stored until ready for extraction.

Following DNA extraction, a PCR assay will be used to identify the presence of DNA recovered from the maggot's intestines. This procedure identifies and purifies the DNA recovered from samples and can be used as evidence to solve criminal cases such as homicide, sexual assault, and negligence. Gene sequences will be amplified by PCR, sequenced, and analyzed by capillary electrophoresis. The expected findings of this study may determine that arid environments can affect the amount and recovery of DNA. In addition, the amount of DNA recovered is expected to be higher in an outdoor environment versus indoor environment. Therefore, these results can determine that environmental factors may show differences in decomposition patterns that can influence the recovery of DNA in remains.

---

#### **Arid Environment, Decomposition, Mitochondrial DNA**