



Pathology Biology Section – 2009

G93 Consumption of Fly Artifacts After Deposition and Translocation of Bloodstains by *Calliphora vicina* (Diptera: Calliphoridae)

Becca Striman*, 1347 North 37th Street, Lincoln, NE 68503; Amanda Fujikawa, BS, 202 Entomology Hall, University of Nebraska-Lincoln, Lincoln, NE 68583-0816; Larry Barksdale, MA, Lincoln Police Department, 575 South 10th Street, Lincoln, NE 68508; and David O. Carter, PhD, University of Nebraska, Lincoln, Department of Entomology, 202 Plant Industry Building, Lincoln, NE 68583-0816

By attending this presentation, attendees will learn of two newly observed behaviors through which *Calliphora vicina* can alter bloodstain patterns.

This presentation will impact the forensic community by contributing information to the current literature regarding the behavior of *Calliphora vicina* when exposed to blood. Blow fly behavior can alter bloodstain patterns at crime scenes, which can lead to inaccurate crime scene reconstruction.

The purpose of this study was to observe the behavior of *C. vicina* when exposed to an expired bloodstain pattern and their effect on bloodstains on wallpaper, white textured wall, and white laminate floor.

The experiment was conducted using eight microscenes (0.46 m³ wooden boxes) that had two glass walls and a plexiglass ceiling to enable easy observation and documentation. The other surfaces consisted of a textured, white painted wall, a wallpapered wall, and a white laminate floor. A holding cage was attached to each microscene, in which ten flies were placed. Four of the microscenes were control scenes and no flies were placed in their holding cages. The holding cages were designed to allow the flies access to the microscene without human intervention.

Fresh human blood was used within ten minutes of being drawn. In each microscene, approximately three milliliters of blood were poured into a pool in a corner of the microscene. The donor then put three milliliters of blood in his mouth and expired blood into the microscene. The blood was directed towards the interface between the wallpaper and white painted wall. The flies were allowed entry to the microscene for 72 hours and had access to sugar and water.

Flies moved from the holding cage into the microscene within 10 minutes and began feeding on the blood within five hours. All deposited artifacts that were observed were produced from defecation. No artifacts with long tails were made while the flies were exposed to light. Blow flies were observed feeding on fly artifacts, sometimes within seconds of the deposition of the artifact. Some of the artifacts were completely consumed by the flies. During the last half of the experiment, the flies fed on artifacts in equal or greater proportion to the bloodstain pattern. A small drop of blood was translocated by the mouthparts of the flies. The mouthparts were swept across the wall in an arc, beginning at the original source and ending at the new droplet, without leaving a trail of blood. The flies were observed feeding on the bloodstain pattern until the experiment ended.

The consumption of fly artifacts may occur because the artifacts could be easier to digest than pure blood, in the same way that regurgitated blood is easier to digest. However, defecated artifacts are unlikely to be as nutritious as pure blood. Translocated blood droplets may cause additional confusion when analyzing bloodstain patterns, especially if a reliable method is developed to distinguish fly artifacts from human blood. It is unknown how common this behavior is or whether it could significantly alter the overall bloodstain pattern. It is important for crime scene investigators to consider the behavior of blow flies when attempting to reconstruct a crime scene based on bloodstain pattern analysis. However, many more experiments are needed before this subject is thoroughly understood.

Forensic Entomology, Expired Blood, Blow Fly