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### E53 Climate's Influence on Diptera Present on a Carcass

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**Learning Overview:** After attending this presentation, attendees will better understand the role of climate on the presence of flies (Order: Diptera) that would be expected to colonize human remains in southwest Wisconsin.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by revealing the relationship between climate and the presence of flies on remains located in southwest Wisconsin. Entomological information is provided from other studies conducted that have similar climates to southwest Wisconsin for data analysis. Relationships between data collected from the adult and larval flies recovered from pig and rabbit carcasses and the Postmortem Interval (PMI) will be presented.

This study hypothesized that the local climate would affect the Diptera present on a decomposing carcass. A key objective was to identify the taxonomic relationships of flies (Order: Diptera) that colonized the pig and rabbit carcasses. The locations of these flies were documented relative to the proximity to areas of trauma. Postmortem indicators of death (algor, livor, and rigor mortis) were also observed and recorded. A scale was developed to determine the level of fixation for each of the PMI indicators observed.

Animal carcasses were exposed to the local climate conditions recorded between September 2016 and December 2017 (16 months) at the field study station located in Platteville, WI. The animal was placed on a soil-filled wooden box that was placed on top of a cement slab isolated by a chain link kennel fence. This simulated a body dump site on top of soil but was protected from scavenging animals. Temperatures were measured at selected intervals up to 72 hours after death. Fly samples were collected at these intervals and at any time the site was inspected. A chi-square test for independence was used to analyze the various data collected and significant differences indicated by p values <0.05

Results of the study indicated that the climate impacted the presence and species of flies colonizing the animal carcasses at the field station. Two families of Diptera were present, these were identified as Calliphoridae and Muscidae. Data also agreed with the observations that flies appear on deceased bodies prior to any other indicators of death. The data indicated that flies did not have a preference to colonize an area of trauma or a natural orifice. Temperature and rainfall impacted the quantity of flies and number of species present in the warmer months (June–September) compared to the colder months (October–December) when flies were noticeably reduced.

Entomological information on the presence and species of flies colonizing remains found in southwest Wisconsin was reported for the first time by these research findings. This information may be extrapolated to human remains and would be a basis for interpreting medicolegal findings during possible homicide investigations.

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**Calliphoridae-Muscidae, Climate, Forensic Entomology**