



H102 Diurnal Oviposition of Blow Flies: Does Time of Day Influence the Likelihood or Magnitude of Oviposition?

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After attending this presentation, attendees will better understand the impact that the time of day has on blow fly (Diptera: Calliphoridae) oviposition (egg laying).

This presentation will impact the forensic science community by making attendees aware that any information regarding blow fly oviposition is critical for accurate Postmortem Interval (PMI) estimations; this research provides important insights into diurnal blow fly oviposition and the abiotic factors that may be influencing it.

Many studies have been conducted on the nocturnal oviposition behavior of blow flies and most authors conclude that it does not occur. Forensic entomologists know that blow flies lay eggs diurnally, but according to this research, there have been no studies documenting differences in hourly diurnal oviposition in blow flies. Studies of other insects show two daily oviposition peaks and researchers are interested in determining whether or not blow flies exhibit a similar behavior.

This presentation has important implications for forensic science. If this research finds a diurnal time period during which oviposition does not occur, it will impact forensic entomologist's PMI estimations. The PMI is the time period between death and corpse discovery and entomologists provide an estimation of this interval based on insect activity. A long delay in oviposition during the morning hours could result in entomologist's needing to push PMI estimations back to the previous day.

This study seeks to document any differences in the likelihood or magnitude of oviposition by blow flies in relation to hours after sunrise. Research is being conducted in Valparaiso, IN, during the spring, summer, and fall months. Research commenced in June 2014 and will continue for multiple field seasons.

Chicken liver (17.5 grams) was put into an aluminum foil bowl and placed inside a foam container with vermiculite in the bottom. Three replicates were exposed to colonization every daylight hour starting one hour after sunrise and ending at the sunset hour. The liver was removed from refrigeration two hours before field exposure. The temperature of the liver prior to field placement was approximately 23°C. After one hour of field exposure, liver was removed from the field and checked for the presence of eggs. Any egg masses were weighed using an analytical balance. Eggs were reared to third larval instar maggots for identification. Light readings were taken hourly and weather data (temperature, humidity, and wind speed) were downloaded from Valparaiso University's weather station.

The preliminary results of four trials show no oviposition in the morning hours. Oviposition has been found between the hours of 1:15 p.m. and 6:15 p.m. and has occurred most often at light values between 4,000-8,000 lux. This is significantly lower than the highest light values of the day, which were around 100,000 lux. Oviposition has happened at temperatures ranging 21°C-26°C. One run yielded no oviposition, but temperatures did not get above 20°C. The warm weather flies *Phormia regina* (Meigen), *Lucilia coeruleiviridis* (Macquart), and *Lucilia sericata* (Meigen) have been identified in this study and the unseasonably cool summer in Valparaiso could be influencing their activity. Oviposition has been found after lux values peak for the day and within three hours of the highest temperature. Researchers will continue to examine light, temperature, and humidity to see whether fluctuations in these variables correlate with oviposition events.

These early results indicate a strong preference for oviposition in the afternoon hours. Blow flies were observed on the bait one hour after sunrise, but did not oviposit for seven hours after their initial activity. Any information regarding blow fly oviposition is critical for accurate PMI estimations and this research provides important insights into diurnal blow fly oviposition and the abiotic factors that may be influencing it.

Blow Fly, Diurnal Oviposition, Forensic Entomology