



G75 Have I Eaten Here Before? Considering Multigenerational Colonization of Remains by Blow Flies

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After attending this presentation, attendees will understand that there is little potential for multiple generations of blow flies arising from the same corpse.

This presentation will impact the forensic community and/or humanity by demonstrating a substrate limitation to blow fly colonization of decomposing remains.

Forensic (or medicocriminal) entomology, the use of arthropods in legal investigations, is most frequently employed to estimate the postmortem interval (PMI) of victims of violent crimes or suspicious deaths. The most commonly used method of PMI estimation employs temperature-dependent developmental rates of blow fly larvae (Diptera: Calliphoridae). Retrospective scene temperatures, those temperatures that the insects experienced during development, are used in combination with known developmental rates of the species involved to estimate the age of the insects, which often correspond closely with the time of death of the victim.

One key element entomological analysis is the use of the oldest insects associated with the body, as these represent the closest estimate of the minimum time since death. This facet of forensic entomology consequently leads to questions by investigators and attorneys regarding the potential for multiple generations of blow flies arising from the same corpse. While blow flies continue to be attracted to the carrion well into the later stages of decomposition, the carcass is no longer attractive as an oviposition medium after some point, and it is widely held that the maggots which fed on a set of remains will not normally eclose as adults and oviposit on the same body. Flies in abnormal conditions, however, have been known to alter their behavior as a response to their circumstances. The goal of this study was to investigate whether adult blow flies eclosing into a situation where there is no carrion source other than their larval host would oviposit on this carcass or die without reproducing.

Six freshly killed pig (*Sus scrofa* L.) cadavers (~53 kg) were placed on the soil surface and left undisturbed for approximately 45 hours (75 ADD-B0) to allow for extensive insect colonization. After this time, Lumite® (18 x 14 mesh) exclusion cages (6 ft³) were erected over each pig. After placement of the cage, adult blow flies were physically killed or removed from the cage. Subsequent maggot development into adult blow flies occurred within each cage, resulting in high populations of adult flies that represented the first generation of fly development on the cadaver. Following the emergence of adult flies within each cage, a 'choice'/'no choice' study was conducted by placing a freshly killed pig (~47 kg) in three of the cages and observing for colonization of each carcass.

In this study, each of the fresh pig cadavers in the 'choice' portion of the experiment were colonized readily by blow flies, but none of the decomposed remains (in either the 'choice' or 'no choice' scenarios) were colonized. This result is not unexpected, but confirms the conventionally held understanding of a single generation of blow flies emerging from a single corpse, even under extenuating circumstances. The fact that blow flies under these conditions die without reproducing indicates the unsuitable nature of a body that has undergone advanced decomposition as larval substrate.

Forensic Entomology, Decomposition, Taphonomy