H22 The Effects of Carrion Clothing Color on Blow Fly Oviposition

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Learning Overview: After attending this presentation, attendees will have a better understanding of the timing of blow fly oviposition in relation to clothing color. Species composition and ambient factors will also be presented.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing how the timing of blow fly oviposition in relation to clothing color can impact accuracy in estimating the Postmortem Interval (PMI).

Forensic Entomology is the use of insects in medicolegal investigations.[1] The blow fly is typically the first type of insect that will arrive to a carcass.[1] Blow flies are attracted to the volatile chemicals given off by the decomposing carcass and upon arrival will begin to mate and lay eggs on the carcass. Entomologists use blow flies to determine PMI, the time that has elapsed since death. PMI can be affected by many different factors that include temperature, weather, and geographical location.[2] Blow flies are among the most important insects in medicolegal investigations and information about their behavior is important for accurate PMI estimations.

Previous studies examined the effects of clothing on carcass decomposition and patterns of insect succession on clothed and unclothed carcasses. They found that blow flies preferred clothed carcasses over unclothed and would oviposit and stay longer on the clothed carcasses than the unclothed.[3] Another study looked at the color attractiveness of *Calliphora vomitoria*. They determined that blow flies prefer black targets in comparison to white, yellow, red, or blue targets.

In this study, investigators examined the effects of carrion clothing color on blow fly oviposition. Based on the previous studies, it was hypothesized that blow flies would show an oviposition preference to pigs dressed in black. Six fetal pigs, three dressed in white cotton onesies and three dressed in black cotton onesies, were laid out in a grass enclosure for several days until fully decomposed (approximately ten days). Pigs were covered with a layer of chicken wire to prevent interference by scavenging animals. Observations were made twice daily to monitor blow fly oviposition and general insect activity. Maggots in the third instar larval stage were collected from each pig during daily observations. Two trials of six pigs each were conducted in the fall of 2019. Maggot species were then identified using a microscope and taxonomic keys.[4] *T*-tests were conducted to determine if there was a statistical difference between blow fly species present at white- versus black-dressed pigs. There were no statistical differences in species composition between pigs clothed in black garments versus white garments. There were more wasps on pigs dressed in black garments. There was overall more insect activity, including larval and adult blow flies, on pigs dressed in black garments. There was no statistical difference in the number of first, second, or third instar maggots between trials 1 and 2. P values for the comparison of instars present in each trial were all larger than 0.05.

Reference(s):

1. Byrd, J. and J. Castner. 2010. *Forensic Entomology: The Utility of Arthropods in Legal Investigations*, 2nd ed. CRC Press, Inc., Boca Raton, Florida. 681 pages.
2. Haskell, N. and R. Williams. 2008. *Entomology and Death: A Procedural Guide*, 2nd ed. Forensic Entomology Partners, Clemson, South Carolina. 182 pages.
3. Voss, Sasha et. al. Decomposition and insect succession of clothed and unclothed carcasses in Western Australia. *Forensic Science International* 211, no. 1-3 (2011): 67-75.
4. Stojanovich, C., H.D. Pratt, and E.E. Bennington. 1962. *Fly Larvae: Key to Some Species of Public Health Importance*. US Department of Health, Education and Welfare. Public Health Service, Communicable Disease Center, Training Branch, Atlanta, Georgia.

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