



Pathology Biology Section – 2011

G101 The Effects of Household Chemicals on Blow Fly Oviposition and Development Using Human Cadavers

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After attending this presentation, attendees will have a better understanding of the effects that household chemicals have on the insect's role in the decomposition of the human body. This research was inspired from a murder that occurred in Lafayette, Indiana where the perpetrator sprayed Raid® on the body of the victim. This led researchers to question what effects Raid® and other household chemicals have on blow fly activity and subsequently estimations of the postmortem interval (PMI).

This presentation will impact the forensic science community by exploring the hypothesis that bodies treated with the chemical ammonia would not significantly vary from bodies with no treatment and bodies treated with Raid® would significantly vary. This hypothesis was based on the results of previous research conducted on swine.

Six human bodies, (four male and two female), were obtained for use in this study and frozen prior to placement in the field. This research was conducted at the Anthropological Research Facility at the University of Tennessee in Knoxville. The field research started on July 18, 2010 and concluded on August 6, 2010. The bodies were placed in the field in sealed body bags and allowed to thaw for a period of 48 hours prior to treatment with chemicals. After the bodies were removed from the bags they were checked for any evidence of insect activity and none was observed. Two bodies (male) were not treated with chemicals and served as controls. Two bodies (one male, one female) were coated with 1275 g (3 cans) of Raid for Flying Insects, (active ingredients 0.05% permethrin, 17.5% tetramethrin, 0.05% d-cis/trans allethrin). Coating involved spraying the bodies with Raid until runoff occurred. Two bodies (one male, one female) were coated with 9.45 L (5 bottles) of Great Value brand household ammonia. The ammonia was poured onto the body until runoff occurred. Treatments were randomly assigned using a random number generator. The bodies were monitored and photographed twice daily and notes were taken to document blow fly activity. The following major stages of insect activity were noted: adult flies, fly eggs, fly larvae, migrating fly larvae, presence of beetles, and the end of maggot migration (characterized by the absence of observable larvae on the body). This allowed researchers to document differences in development time as well as the initial onset of blow fly life stages. Adults and larvae were collected following standard operating procedures outlined in Haskell and Williams (2008) each day to document any differences in species composition or development among treatments. Larvae were collected in KAA (composed of 95% Ethanol (77%), Acetic Acid (15%) and Kerosene (8%)) and adults in 70% EtOH. The research was still in progress during the writing of this abstract, but the results and conclusions of the study will be discussed during the presentation.

Forensic entomologists are often asked by law enforcement agencies to provide an estimation of the PMI using insects. If chemicals are applied to a body and that has an effect on the blow fly activity, then the estimation of the PMI is therefore compromised. The data obtained from this research will impact the forensic science community by helping to overcome this obstacle when chemicals are involved and yield more accurate assessments by forensic entomologists. **Forensic Entomology, Chemicals, PMI**