D29 Interactions Between the German Cockroach (*Blatella germanica*) and Pooled Bloodstain Patterns

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After attending this presentation, attendees will have a better understanding of bloodstain pattern analysis and interactions between cockroaches and bloodstains.

This presentation will impact the forensic science community by increasing knowledge of insect stains, specifically those made by the German cockroach (*Blatella germanica*), and bloodstain patterns at crime scenes; this will result in a more accurate bloodstain pattern analysis.

Bloodstain pattern analysis can assist in reconstructing a sequence of violent events at crime scenes. Yet, bloodstain pattern analysis can be confounded by the behavior of insects that use blood as a food source. For example, cockroaches have been reported anecdotally to change the shape of bloodstain patterns and form additional patterns (insect stains) through feeding. At present these changes are poorly understood. To improve understanding of these processes, a laboratory experiment was conducted to observe the interactions between German cockroaches (*Blatella germanica*) and pooled bloodstains. The null hypothesis was tested that German cockroaches will not alter the morphology and presumptive chemistry of pooled bloodstain patters over a period of 48 hours.

This experiment was conducted in a microscene. A microscene is a 47.5 cm^3 wooden box with two glass walls, two wooden walls and a Plexiglas ceiling. The two wooden walls were covered with wallpaper and the floor was covered with linoleum. Six milliliters of freshly drawn human blood was pooled on the linoleum. Five cockroaches were then added to the microscene. Cockroaches were kept in the microscene for 48 hours. After this time three presumptive blood tests were used (phenolphthalein, leucocrystal violet, Hemastix®) to determine if cockroach stains tested positive for blood. This experiment was replicated four times and controls (blood without cockroaches) were used.

During the initial 30 hours the cockroaches did not alter or feed on the bloodstains. Cockroaches walked around pooled bloodstains when moving throughout the microscene. In the final 18 hours, however, cockroaches fed on bloodstains and formed insect stains via defecation and tracking (transferring blood from feet or abdomen to surface). Insect stains were present on the linoleum floor only and could be confused with impact bloodstain patterns. No significant differences existed when testing insect stains and blood with Hemastix® and phenolphthalein. However, insect stains did not react with leucocrystal violet.

Insect Stains, Bloodstain Pattern Analysis, Insect Artifacts

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