



Pathology & Biology Section – 2005

G52 A Comparison of Pig and Human Tissue in Studies of Decomposition: Can Flies Tell the Difference?

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The goal of this presentation is to provide preliminary studies that demonstrate how some forensically significant fly species may be attracted to different types of carrion in varying degrees and to determine if blowflies are differentially attracted to human or porcine carrion via olfaction.

This presentation will impact the forensic community and/or humanity by providing preliminary studies which indicate that currently practiced research methods may not deliver the most accurate results.

These studies asked whether adult scavenger insects respond differently to volatile compounds emanating from human or porcine remains, in an effort to determine if porcine surrogates may legitimately be substituted for human remains in forensic entomology research. No difference in the arthropod fauna attraction to either type of carrion was anticipated.

Natural insect populations were exposed to odors from human or pig tissue samples contained in traps that bar visual cues. Traps consisted of a small tub filled with carrion suspended within a covered five-gallon plastic bucket or 35-gallon plastic trashcan and above propylene glycol poured four centimeters deep. Holes six centimeters in diameter were drilled six centimeters below the rim of the outer bucket or trashcan to allow insects to have access to the carrion. Once inside the trap, insects drowned in the propylene glycol. They were periodically sieved from this preservative then rinsed and stored in ethanol. For identification to species, forensically significant insects were first rinsed in acetone then pinned.

In a preliminary experiment, equivalent weights of pig or human thigh and forearm tissue in five-gallon bucket traps were used. Eight species of flies arrived at either carrion. Five were common to both types of carrion. Three species of flies were recovered solely from traps baited with human carrion, and no species were recovered exclusively from porcine carrion.

In the later experiment, employing 35-gallon trashcan traps, the plastic tubs were baited with a human or pig cephalic specimen. These tissues attracted a greater diversity of fly species, totaling 15. Eight of these were common to both types of carrion, three were found associated only with human tissue, and four only with porcine material.

Over both experiments, a total of 16 species of flies were collected and identified. Of these, 11 were found on both types of carrion. Two were consistently identified only on the human specimens, and four species were found solely on the porcine tissue.

Although the results of these experiments remain preliminary, they suggest that adult fly populations on human or porcine carrion may be qualitatively different. The impact on current methods of postmortem index (PMI) can only be determined through the collection of additional data sets.

Olfaction, Forensic Entomology, Carrion