G24 Validation of the Anthropology Research Facility in Knoxville, TN, as a Research and Training Site For Forensic Entomology

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The goal of this paper is to present to the forensic sciences community the latest findings on the scientific validity of the Anthropology Research Facility (University of Tennessee, Knoxville) as a research and training site for forensic entomology.

The on-campus Anthropology Research Facility (ARF) at the University of Tennessee, Knoxville, established by Professor William Bass in 1972, remains the only global site devoted to the study of human decomposition. The 20-year history of arthropod exposure to decomposing bodies at ARF led Tennessee v. Coe (1993) to speculate that this site is saturated with sarcosaprophagous arthropods thus rendering it biased and atypical. Here the authors report results of a comparative field test of the arthropod saturation hypothesis conducted during summer 1998 at ARF and three other sites at varying distances from ARF (S1): S2 (700 m away), S3 (6 km) and S4 (40 km). Three dead pigs (*Sus scrofa* Linnaeus) of known weight were spaced 1.8-2.5 m apart at each of the four sites with two pigs placed on wire screens to record daily weight loss. Ground and flying arthropods were sampled from each pig using pitfall traps and sweep nets, respectively, once daily for up to 12 days. In excess of 81,000 invertebrates were collected and identified over the 12-day period representing 26 orders, 118 families, and 223 taxa. The fauna was reduced to 64,950 and 6,848 individuals after pitfall and sweep-net counts of forensically important taxa, respectively, were sorted, for a total carrion fauna of 71,758 individuals. On an experiment-wide level, pair wise tests showed carcass weight losses, surface temperatures, and maggot mass temperatures to be statistically comparable across days and sites in nearly every case. Likewise, matched abundance plots, accumulation curves, and ecostatistical tests each showed that the fauna at ARF is comparable to the other three sites with respect to colonization rates, aerial species richness, and ranked abundances of forensically important taxa. In the only exceptional case, pitfall catches were found to be statistically different in species richness (at the nominal 0.05 level) between Site 4 and the other three sites. Overall, these results support the conclusion that ARF is faunistically and statistically comparable to nearby field sites for conducting carrion ecology and forensic entomology field studies.

Forensic Anthropology Facility (ARF), Forensic Entomology, Decay Rates

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