H50 Stages of Decomposition of Human Remains in a Subtropical Humid Environment

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After attending this presentation, attendees will gain an understanding of the stages of decomposition of human remains in a subtropical humid environment, similar to that found in Louisiana, Mississippi, Alabama, Georgia, most of Florida, South Carolina, and portions of North Carolina. Attendees will understand how the physical changes within the stages of decomposition differ from those in temperate, arid and cold climates. Attendees will be introduced to a new two-tier system of categorizing physical changes that occur during the decomposition process.

This study will impact the forensic science community by emphasizing to attendees through the present study how human decomposition is regionally specific and that some characteristics seen in advanced decomposition in temperate environments occur in the beginning of early decomposition in a subtropical humid environment.

Medical examiners, law enforcement agents, and forensic specialists who deal with human decomposition have based their assessment of the postmortem interval on stages of human decomposition established in temperate, cold, and arid environments (Bass, Galloway, Komar, Weitzel).[1-4] Four stages of decomposition have been established from the work of Bass and Galloway. The stages include fresh, early decomposition, advanced decomposition and skeletonization. The descriptions within these stages are based on various colors and general physical characteristics. Although helpful, the present study found that color should not be a predominant factor in the assessment and that there are more physical characteristics present that should be used in the determination of the decomposition stage. In addition, due to the subtropical, humid environment of southeast Texas and the regional scavengers and insects the decomposition process is quite different than temperate or cold climates.

The present study was conducted at the Southeast Texas Applied Forensic Science Facility (STAFS) at Sam Houston State University, Huntsville Texas, a human decomposition research facility.

Over a two-year period human cadavers were placed on the surface, in a natural outdoor facility and allowed to decompose to the stage described in previous research as "skeletonization."

Subjects were placed, unclothed, in areas that received both sun and shade throughout the day. Cages comprised of wooden frames and galvanized mesh wire were placed over some of the individuals in order to prevent scavenging activity. Other subjects were not caged and were accessible to scavengers. The subjects were photographed and observed daily. Climatic data were also collected daily.

Results show that in both sun and shade the skin mummifies. Scavenging is predominantly done by vultures and scavenging begins in early decomposition and extends through advanced decomposition but ceases at skeletonization. In addition, desiccation begins in early decomposition, and once the remains are desiccated, they stay arrested in that state indefinitely and rarely progress to skeletonization. The skeletal elements of subjects that were not accessible to scavengers were blanketed by mummified tissue with minimal hair loss. Skeletal elements in some subjects accessible to scavengers were categorized as reaching skeletonization, but only as a result of vultures pulling the soft tissue away from the bone. Although the bones were exposed, the soft tissue was laying in the vicinity of the body.

In early decomposition, none of the subjects in this study could be described as "pink-white appearance with skin slippage and some hair loss.". Nor could any subjects be categorized in the advanced stage as "moist decomposition." In the trunk region, the decomposing tissue does not "sag" as described in advanced decomposition, but rather crinkles as a result of desiccation of the tissue.

These findings show that descriptions of the physical characteristics occurring during decomposition need further clarification and detail. The findings also show that decomposition is regionally specific and the need for research in various climate zones is necessary.

References:

1. Mann RW, Bass WM, Meadows L. Time since death and decomposition of the human body: variables and observations in case and experimental field studies. J Forensic Sci 1990;35:103-111.
2. Galloway A. The Process of decomposition: a model from the Arizona Sonoran Desert. In: Haglund WD, Sorg MH, editors. Forensic taphonomy: the postmortem fate of human remains. Boca Raton: CRC Press, 1997:139-150.
3. Komar DA. Decay rates in a cold climate region: a review of cases involving advanced decomposition from the Medical Examiner's Office in Edmonton, Alberta. J Forensic Sci 1998;43(1):57-61.
4. Weitzel MA. A report of decomposition rates of a special burial type in Edmonton, Alberta from an experimental field study. J Forensic Sci 2005;50(3):641-7.

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