



### **H49 Suitcase Concealment: An Interdisciplinary Analysis of the Taphonomic Processes and Their Effect on Postmortem Interval (PMI) Estimation**

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After attending this presentation, attendees will better understand the entomological and decompositional changes that are likely to occur when a body is concealed within a suitcase after death.

This presentation will impact the forensic science community by providing results from an experiment that analyzed the taphonomic effects of body concealment within suitcases, a topic that has had only minimal previous research conducted.

In cases of homicide, suitcases provide concealment and may ease the transport of a body with minimal likelihood for detection. In order to create a minimum Postmortem Interval (mPMI) estimate, it is first necessary to understand the unique taphonomic processes that occur when a body is concealed within a suitcase. In this study, the experimental carcasses consisted of pig (*Sus scrofa*) heads, which were concealed within either hard-shell plastic suitcases or fabric suitcases; the control pig heads were left on the surface of the ground to decompose naturally. Starting on day 3 of each study period, and continuing every other day until day 15, three suitcases of each type were removed from the field for analysis of the entomological activity inside the suitcases and the decompositional stage of the pig heads. Additionally, the ambient temperature and the temperature inside each type of suitcase was recorded by temperature data loggers throughout the duration of each study period. The study was conducted at Boston University's Outdoor Research Facility in Holliston, MA. This study was repeated twice, once in May and once in August 2016.

Temperature comparisons revealed that the hard-shell plastic suitcases reached significantly ( $<0.001$ ) hotter temperatures than both the ambient temperature and the temperature inside the fabric suitcases. Insect activity began immediately on the control samples during both study periods; however, during study one, insect activity was not present inside the fabric suitcases until days 3-5, and did not occur inside the hard-shell suitcases until days 5-7. During study two, insect activity inside both types of suitcases was present by day 3, but not guaranteed to occur until day 4 or later. Some differences in insect species were noted between the controls and the suitcases, as well as between both types of suitcases. Most notable was the presence of a number of fly (Diptera) species inside the suitcases that are generally associated with late decomposition. Additionally, while beetles were present on the control samples, none were found inside the suitcases. All control samples mummified within days, while all of the experimental samples experienced wet decomposition, often resulting in skeletonization by day 15.

In conclusion, this study has shown that not only does concealment within a suitcase change the taphonomic history of the body enclosed, but that the type of suitcase also influences the taphonomic factors that the body will experience. Ultimately, this study will aid in the ability to better predict the mPMI for cases in which a body is concealed within a suitcase.

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#### **Suitcase Concealment, Taphonomy, Postmortem Interval**