



## Anthropology Section - 2016

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### A133 Postmortem Intervals in Mice Submerged in Aqueous Environments at 20°C

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After attending this presentation, attendees will understand the variances in decomposition in aqueous environments such as marine and freshwater. The goal of this presentation is to encourage further academic study and experiments to study the decomposition rates in different water sources and soil samples globally.

This presentation will impact the forensic science community by reiterating and emphasizing the importance of continued research in aqueous environments due to continual changes in various water sources. The data obtained from this study demonstrates the differences in decomposition rate between the River Bourne and the English Channel within Bournemouth, United Kingdom; however, the need for an experiment which spans more than six weeks is noted to explore the possibility of variances increasing to the point of significance after a set point in time.

Aquatic environments offer a unique challenge in determining postmortem intervals. Water sources in the same region — even within a few miles of each other — can differ in salinity and overall mineral composition. Limiting confounding variables in a laboratory environment removes the variance in animal activity as well as temperature and light differences within the same environment due to depth. While aqueous submersion can impede decay in some aspects, submersion can also produce decomposition stages not seen in terrestrial burials. Submerged bodies have a greater likelihood of accelerated skin slippage with extended preservation of fatty tissues. Particular specimens were noted in this study to enter a gelatinous stage as a result of the varying speeds in internal and external decomposition.

To further understand the variances, 54 mice were submerged in marine water, freshwater, and a control environment at 20°C. The two water sources utilized for this study were from the surrounding area around Bournemouth, United Kingdom. The marine water was obtained near the Bournemouth Pier coastline on the English Channel while the freshwater was taken from the River Bourne, which runs into the channel. The 54 mice displayed sequential stages at differing rates over a six-week time period. Regression plots and comparative *T*-tests demonstrated that internal putrefaction rates, weight differences pre- and post-submersion, and abdominal circumference pre- and post-submersion of the aqueous environments differed significantly from the control group. The aqueous subjects did not vary significantly from each other quantitatively; however, the salinity of the marine samples resulted in differences visually which might not have occurred in a deeper container. The postmortem intervals were not consistent regardless of temperature or environment, though a clear variance was noted between the control and the submerged groups.

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#### **Aqueous Decomposition, Submerged Specimens, Forensic Science**