



Anthropology Section - 2015

A42 Effects of Hydrated Lime and Quicklime on the Decay of Human Remains Using Pig Cadavers as Human Body Analogues: Field and Laboratory Experiments

Eline M.J. Schotsmans, PhD*, University of Bordeaux, UMR 5199 PACEA Bâtiment B8, Allée Geoffroy St Hilaire CS 50023, 33615 Pessac Cedex, Aquitaine, FRANCE

After attending this presentation, attendees will understand the short- and long-term effects of hydrated lime and quicklime on the decomposition of human remains. An increased number of police inquiries involving human remains buried with lime has demonstrated the need for more research into the effect of different types of lime on cadaver decomposition and its micro-environment.

This presentation will impact the forensic science community by showing results that have implications for the investigation of time-since-death of limed remains and potentially for the interpretation of clandestine burials, mass graves, and management of mass disasters by humanitarian organizations and Disaster Victim Identification (DVI) teams. Knowledge of the effects of lime on decomposition processes is of interest to forensic pathologists, archaeologists, humanitarian organizations, and those concerned with disposal of animal carcasses or human remains in mass disasters.

Contradictions and misconceptions regarding the effect of lime on the decay of human remains have demonstrated the need for more research into the effect of different types of lime on cadaver decomposition.

In this study, a series of field and laboratory microcosm experiments are presented studying the effects of lime. Six pig carcasses (*Sus scrofa*), used as human body analogues, were buried without lime, with hydrated lime (Ca(OH)_2), and with quicklime (CaO) in shallow graves in sandy-loam soil in Belgium and recovered after 6, 17, and 42 months of burial. Analysis of the soil, lime, and carcasses included entomology, pH, moisture content, microbial activity, histology, and lime carbonation. The results of this study demonstrate that despite conflicting evidence in the literature, the extent of decomposition is slowed down by burial with both hydrated lime and quicklime. The more advanced the decay process, the more similar the degree of liquefaction between the limed and unlimed remains. The end result for each mode of burial will ultimately result in skeletonization. A further three pig carcasses (*Sus scrofa*) were observed and monitored for 78 days without lime, with hydrated lime, and with quicklime in a taphonomy laboratory. The results showed that in the early stages of decay, the unlimed and hydrated lime cadavers follow a similar pattern of changes. In contrast, the application of quicklime instigated an initial acceleration of decay. Microbial investigation demonstrated that the presence of lime does not eliminate all aerobic bacteria. The experiment also suggested that lime functions as a sink, buffering the carbon dioxide evolution. In the absence of other studies on lime in graves, this research produces valuable and novel information of interest to the forensic society.

Lime, Taphonomy, Differential Decomposition