



G102 Reconstruction of Decay Processes of a Dead Child's Body in a Plastic Garbage Bag

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After attending this presentation, attendees will know how important questions concerning a homicide case were answered by step- by-step reconstruction using pig cadavers and special knowledge of various disciplines.

This presentation will impact the forensic community by underlining the statement that “extraordinary” methods are sometimes helpful in forensic taphonomy and moreover emphasize the cooperation of scientists from different disciplines.

The remains of a 10-year-old girl hidden in a plastic garbage bag in a wooded area in Northern Germany were recovered. The girl had been reported missing three months earlier. Her body was in a stage of advanced decay, the soft tissue had been entirely liquefied, colored grayish pink and foamy in sections, whereas the bare skeleton was visible. The bones were complete and the arrangement of the skeleton indicated that the body had originally been left in *anteflexion* with bent knees. The foot bones were still inside the shoes and the underpants were positioned around both ankles indicating preceding sexual abuse. No evidence as to mammalian-feeding defects neither to preceding blow fly (Diptera: Calliphoridae) activity was observed. Only some skipper flies (Diptera: *Piophilidae*, “Cheese Skippers”), well known as late colonizers, were detected. Considering the climate of northern Germany the question had to be answered. Could a dead body get into that advanced state of decay within three months time without addition of any chemical substances? Extensive toxicological investigations merely resulted in high concentrations of calcium (1120 mg/kg) in the liquefied tissue. The influence of hydrogen peroxide was considered but excluded because large quantities of the long scalp hair were found still in its original brown color.

Experiments with pig cadavers (n=14; 20-30 kg) in plastic bags under equivalent environmental conditions revealed that soft tissue was liquefied equally with the skeleton left in anatomical position in those cases without addition of any chemical substances (e.g., quick lime). The pig cadavers where quick lime was added (1:3, 1:10, 1:30) were found with rather dry and hard soft tissue, aridity was increasing with the concentration of quick lime. By following investigations in a specialized microbiological laboratory *Clostridia* species (*C. limosum*, *C. novyi*, *C. sordellii*, *C. sporogenes*) were detected in the remains of the child as well in the liquefied porcine tissue. These *Clostridia* species are reported to produce both histolytic and cytolytic enzymes. Also the foamy consistency of the soft tissue could be explained due to the well documented gas producing activity of *Clostridia* species. Furthermore high calcium levels equivalent to these in the original specimens were determined in the liquefied porcine tissue.

In summary it was concluded, that the body of the child inside the plastic bag reached the state of liquefaction without addition of any chemical substances. The environment inside the closed plastic bag without oxygen supply promoted a shift to benefit the development of the anaerobe bacteria like *Clostridia* species. Hence high concentrations of histolytic and cytolytic enzymes secreted by these microorganisms resulted in a relatively fast liquefaction of the soft tissue. These conclusions were also in accordance with the crime scene analysis (closed plastic bag above ground, underpants around ankles of the corpse) indicating a fast disposal of the dead body after sexual abuse.

Decay Processes, Plastic Bag, Taphonomy