



Physical Anthropology Section - 2013

H113 Slow and Steady Wins the Race: The Rate and Pattern of Soft Tissue Decomposition in Southern Illinois

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After attending this presentation, attendees will gain knowledge of the decomposition rate, pattern, and sequence of surface remains over two years in southern Illinois. Scientists and law enforcement officials involved in human remains investigation will benefit greatly from the data and visuals presented, gaining understanding that the currently published decomposition standards are not directly applicable to the regional environment of southern Illinois.

This presentation will impact the forensic science community by instituting a baseline of information for the decomposition of soft tissue in the southern Illinois region. The findings of studies at the Complex for Forensic Anthropology Research (CFAR) will prove more applicable to forensic cases in climatologically and environmentally similar regions than those from any other comparable facility. This location represents a geographic area that is farther north and has a lower temperature than the locations used to create current methods for estimating Postmortem Interval (PMI). Additionally, the soil is extremely poorly drained and acidic which may have some yet-to-be identified impact on the surface decomposition of research subjects.

Twenty pigs (*Sus scrofa*) are being assessed to establish baseline rates and patterns of decomposition at the CFAR. The research subjects were placed on the surface in both sun and shade areas. Three subjects were covered with 18-gauge wire fencing to prevent scavengers from removing them; two were placed inside a chain-link dog kennel; and the remaining subjects were left unprotected. Research subjects were deposited in all four seasons and have been in place for a minimum of nine months. Several have been exposed for two years. Thermochrons were placed at the CFAR to monitor the exact temperature in the specific microclimate at the site for use of accumulated degree days as the method of quantifying the decomposition rate. Observations of the decomposition stage for each subject were collected daily according to the method set forth by Megyesi *et al.* (2005) using the Total Body Score (TBS) for each subject.¹ Motion-activated cameras were used to record still photographs and video of research subjects. The cameras proved extremely useful in identifying the types and activities of avian and mammalian scavengers in the region.

The recorded data show significant differences in both the rate and pattern of decomposition when the CFAR is compared to other facilities. The CFAR has exhibited a range of scavengers, such as the possum and North American Black vulture, which have fed on the subjects throughout the research period. Furthermore, the CFAR has exhibited a slower progression in time between decomposition stages. Compared to previously published standards from east Tennessee, the Sonora desert, and Texas, decomposition in southern Illinois progresses from the "fresh" to "early" decomposition stage at approximately the same time, but then slows drastically. The research subjects at the CFAR stay in the "early" decomposition phase up to 33 days longer (days used to compare to results published before the use of ADD became standard) than in other climates. Additionally, the length of time spent in the "advanced" decomposition stage is longer than previously reported from other regions of the United States. Currently, the fastest time to skeletonization at the CFAR is approximately 20 days. Much of this variation likely results from the lower temperatures observed in southern Illinois compared to those locations from which previous reports have been published. Further research is necessary and ongoing.

Reference:

1. Megyesi MS, Nawrocki SP, Haskell NH. Using accumulated degree-days to estimate the postmortem interval from decomposed human remains. *J Forensic Sci* 2005;50(3):1-9.

Taphonomy, Decomposition, Forensic Anthropology