



Physical Anthropology Section – 2006

H42 A Preliminary Investigation of Decomposition in Cold Climate

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After attending this presentation, attendees will know how cold climate generally affects the decomposition process. Such information will be useful to medico-legal practitioners for the estimation of postmortem interval (PMI) of decedents recovered from comparable environments.

The research findings presented will be useful for forensic scientists practicing in cold climate environments in the United States and internationally. This is a much-needed data set, as to date; no systematic cold climate assessment of decomposition has been conducted and widely reported. This presentation will impact the forensic community and/or humanity by assisting Medico-legal professionals in utilizing these data for general comparative purposes in estimation of postmortem interval (PMI) for decedents recovered from similar environmental and climatic contexts.

Actualistic studies of environmental factors affecting PMI have been ongoing in particular regions of the United States for years (Anderson and VanLaerhoven 1996; Baldrige *et al.* 2004; Cornelison 1999; Dupras and Williams 2001; Haefner *et al.* 2004; Haskell 1996; Latham *et al.* 2004; Lopes de Carvalho and Linhares 2001; MacGregor 1999; Shean *et al.* 1998; Walsh-Haney and Warren 1999). At the most recent meeting of the American Academy of Forensic Sciences (AAFS), 18 separate studies directly addressing decomposition were featured (e.g., Wallace and Zimmerman 2005, Forbe *et al.* 2005, Gremillion 2005, Srnka 2005, Synsteliën 2005, Schoenly *et al.* 2005, Russo 2005, Wacker *et al.* 2005, Bullard 2005, Tibbett and Carter 2005, and Carter *et al.* 2005).

None of the above-referenced studies and publications addresses the issue of decomposition in cold climate. A systematic study of decomposition in this type of environment represents a large gap in the scientific literature. The most relevant study is that of Komar (1998), which reviewed past cases of the Edmonton, Alberta Medical Examiner's Office. Here Komar presents preliminary data regarding the impact of cold climate on skeletonization and decomposition, since, in her words "studies in cold weather climates typical of the northern United States and Canada have not been widely reported" (1998).

Small grant funding was obtained from the State University of New York at Oswego's Rice Creek Field Station in 2004 to begin a preliminary study of this problem (Bunch 2005). The initial 2004-2005 project, which is still ongoing, used three child-sized (approximately 35-40 lbs) pigs (*Sus scrofa*) as surrogates for human remains. Numerous current and prior studies use/have used pigs in this capacity (Baldrige *et al.* 2004; Cornelison 1999; Dupras and Williams 2001; Gremillion *et al.* 2005; Haefner *et al.* 2004; Haskell 1996; Latham *et al.* 2004; Lopes de Carvalho and Linhares 2001; MacGregor 1999; Shean *et al.* 1998; Wacker *et al.* 2005; Walsh-Haney and Warren 1999). The pigs were placed in three distinct microenvironments (sparse hardwood forest near water source, dense hardwood forest, and spruce forest) soon after they were killed in late October 2004. Enclosures were set up to protect the pigs from larger scavengers so that stations could be easily monitored until skeletonization had occurred.

Preliminary results indicate that, as in other types of well-studied environments, decomposition rates vary greatly from one microenvironment to another: while the spruce forest specimen is in an extremely advanced state of decomposition as of Day 224, the two hardwood forest specimens are still completely fleshed and could be described as moderately decomposed. Possible reasons for this discrepancy will be discussed. In addition, the activity of insects and scavengers varied greatly. Spruce forest insect activity was relatively minimal yet mammal scavenging did occur at this station; hardwood specimens attracted numerous insects until midDecember and again in spring months, yet scavenger activity was notably absent.

The results of this study will be useful as comparative data for forensic science practitioners. It is important to note that not only local law enforcement and medical examiners/forensic anthropologists will find this information useful, but those located in similar climates in the US, Canada, and abroad would undoubtedly be able to utilize these results for their own general comparative purposes.

PMI, Microenvironment, Decomposition