



## Physical Anthropology Section – 2011

### H99 Scavenging and Its Relationship to Decomposition in the Northern Rockies

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After attending this presentation, attendees will better understand the need for assessing scavenging as an aid to discerning the postmortem interval in regions such as Montana, where mummification is a normal part of the early decomposition process and often becomes the static, long term condition of remains not exposed to scavenging.

This presentation will impact the forensic science community by demonstrating many cases of partially and completely skeletonized remains in Montana are likely the result of large carnivore scavenging as opposed to extended periods of exposure as previously thought.

Accurate estimation of time since death can be an important component of a forensic investigation and the processes by which soft tissue is lost from the skeleton need to be well understood, particularly for areas with variable decomposition patterns and the presence of large carnivores.

Recent research by Parsons (2009) and Dudzik (2009) has demonstrated that decomposition rates and patterns in the Northern Rockies of Montana vary from those known elsewhere in the United States. The arid and cool climate not only slows the general rate of soft tissue decomposition, but also results in mummification of the external tissues very early in the decomposition process. Nevertheless, partially or fully skeletonized remains are recovered, even when the postmortem interval has been relatively brief (3-6 months). Typically these remains have been scavenged by one or more of the large carnivores native to Montana, including brown bears, grizzly bears, mountain lions, and wolves.

A retrospective review of twelve cases, with established postmortem intervals, analyzed by the medical examiners of Montana's Forensic Science Division and forensic anthropologists at the University of Montana over a six year period was undertaken. Based on reports, case notes and photographs, degree of mummification was scored by percentage of the body retaining mummified tissue and degree of scavenging was scored as percentage of the skeleton bearing evidence for carnivore scavenging activity. Eight (66%) of the total cases reviewed had either not been subject to scavenging or were only minimally scavenged (scored as 10% or less) with postmortem intervals ranging from three weeks to two years. Of these cases, 75% of the individuals retained mummified tissue covering more than 50% of the body. In the cases where scavenging had significantly affected the remains (scored as 25% or greater), the retention of mummified tissue was limited to 50% or less, with two of these cases having postmortem intervals of less than one year. In summary, remains that do not experience scavenging tend to retain the external layer of mummified tissue, even years after death, while remains that are subject to large carnivore scavenging can be completely or partially skeletonized within a few months.

Therefore, estimations of the postmortem interval for human remains in Montana and similar regions must consider not only the unusual decomposition pattern associated with the climatic conditions of the Northern Rockies, but also the degree of scavenging by large carnivores as this is a likely factor responsible for the absence of soft tissue as opposed to decomposition due to an extended period of exposure. This will assist efforts to identify human remains or to pinpoint the timeframe for a crime.

#### **Decomposition, Scavenging, Postmortem Interval**