H94 Taphonomic Degradation to Bone Through Scavenging by Marine Mollusks of the Class Polyplacophora

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After attending this presentation, attendees will gain a greater understanding of an underreported type of marine scavenging, the damage caused to skeletal elements by marine mollusks, and the characterization of such with special regards to differentiation from other types of scavenging. Specifically, mollusk scavenging has been compared to rodent gnawing; attendees will learn characteristics differentiating these two distinct processes.

This presentation will impact the forensic community by increasing forensic knowledge on the taphonomy of long-term marine exposure, while contributing to the growing body of information regarding time elapsed time since deposition, and providing forensic practitioners with "real-life" examples of taphonomic processes which have previously only been discussed without adequate visual documentation.

Knowledge of taphonomic processes is essential to the forensic anthropologist in estimating elapsed time since death and postmortem influences on remains. Terrestrial taphonomy is well understood and the subject of numerous experimental and regional studies, and yet marine taphonomy in comparison is relatively unexplored. This is problematic for forensic professionals in coastal areas, where marine contexts play a significant role in the postmortem interval.

In February 2007, recreational divers off the coast of British Columbia, Canada recovered skeletal elements from a depth of approximately 20 meters / 60 feet below sea level. Suspecting them to be human, the divers turned over the skeletonized elements to the local police (RCMP), who contacted forensic anthropologists at the Centre for Forensic Research at Simon Fraser University for examination of the remains.

The skeletal elements were clearly of non-human origin. However, the unique taphonomic modification to the bone inspired further examination and consideration. Significant cortical bone mass was removed in deep, wandering channels and concavities. Several mollusks of the class *Polyplacophora* were adherent in the concavities at the time of recovery. Within the concavities, minute lines are etched in roughly parallel, though undulating, striations. These are likely the result of scavenging by the associated *Polyplacophora* who, like other mollusks, constantly expand and remodel their protective shells with calcium carbonate, requiring a high intake of nutritional minerals. *Polyplacophora* feed with a long, tooth lined radula used for scraping up sediments and substrates for their nutritional content. The microscopic teeth lining the radula are tipped with magnetite and must be constantly produced. As teeth are damaged and lost during feeding, new teeth are continuously mineralized and advanced into position. This constant need for dietary minerals suggests that submerged skeletal elements may be an ideal substrate for scavenging by various *Mollusca* species.

This case review highlights how long-term scavenging by marine mollusks, specifically of the class *Polyplacophora*, influences the taphonomic degradation of the skeletal element. Photographic and radiographic documentation illustrate the characteristic nature of damage to the bone and provide a visual example of a regionally unique taphonomy which, until now, has only been superficially discussed in forensic taphonomic literature.

Marine Taphonomy, Scavenging, Forensic Anthropology

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