



E63 Forensic Palynology: Pollen and Its Role in Crime Scene Investigation, National Security, and Forensic Science

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Learning Overview: After attending this presentation, attendees will be familiar with the area of forensic palynology and how pollen and spores have been recently used within the forensic science community to assist with determining postmortem intervals, investigating major crimes, and assisting with national security issues.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by bringing awareness to a subfield of forensic science that is up and coming within the United States. By providing awareness to this field, the forensic science community will be able to see how pollen has been used to solve crimes around the world and the benefits it can bring by being utilized in forensic casework and on-going investigations.

Forensic palynology is an up and coming discipline within the forensic science community. A science that has been utilized in New Zealand is now being used across the globe in Australia, the United Kingdom, and the United States. Forensic palynology uses spores, pollen, and other acid-resistant microscopic plant bodies to assist with criminal and civil cases.¹ The results from the analysis are used to help aid investigators by providing information that links to certain geographic locations. Forensic palynology has also been used in cold case investigations, postmortem interval estimations, and national security issues. Though normally used for outdoor scenes, more research is being conducted on the value of pollen analysis in crimes such as forgery and fraud. Although this science is not prevalent in the United States, it is slowly becoming more recognized through its recent use in cold case work and its current use with national security and organized crime cases with the United States Customs and Border Protection agency.

One of the most recent cases in which forensic palynology was used in the United States was the Bella Bond case or, at the time, the Baby Doe case. An unidentified female was found in the Boston Harbor area of Massachusetts. By utilizing forensic palynology, scientists were able to trace the pollen found with the body to the northeast region, specifically around the Arnold Arboretum in Boston, MA.² This data assisted investigators by providing a geographic location of where the child lived, or was, prior to her death.

Pollen has the ability to withstand most acids and the decay process, which allows it to be found on skeletal remains or heavily decomposed bodies.¹ Due to pollen having these properties, studies have been conducted to try to see if pollen analysis can be used to determine a postmortem interval with skeletal remains, specifically trying to determine a potential season of death. One of the first studies conducted with pollen analysis was on skeletal remains to try to determine a postmortem interval in Magdeburg, Germany, in 1994.

Using pollen analysis, investigators are able to determine where illegal substances are being grown or produced and are able to test the substances to see if they are being locally grown or imported. In one case study, investigators were able to determine that the substance was locally grown and they were not dealing with a larger drug trafficking issue.³ The analysis of marijuana and trying to link the origin of it became very successful, which has then led to pollen analysis being used in other cases involving illegal substances, such as cocaine and methamphetamines.²

Reference(s):

1. Milne L., Bryant, V.M., Mildenhall, D.C. *Forensic botany: Principles and applications to criminal case work*. Coyle HM, editor. Boca Raton, Florida CRC Press, 2014, 216-252.
2. Mason M. *The power of pollen*. 2016 June. <https://www.cbp.gov/frontline/frontline-june-2016-forensics>. Accessed April 16, 2018.
3. Bryant V.M., Jones G.D. Forensic palynology: Current status of a rarely used technique in the United States of America. *Forensic Sci Int*. 2006 Nov;163:183-197.

Forensic Investigation, Pollen, National Security