A Case Study of Suicide by Hemlock Intoxication

Erica Maney

Follow this and additional works at: https://dsc.duq.edu/gsrs

Part of the Anatomy Commons, and the Biology Commons


This Poster is brought to you for free and open access by Duquesne Scholarship Collection. It has been accepted for inclusion in Graduate Student Research Symposium by an authorized administrator of Duquesne Scholarship Collection.
Overview:
Poison hemlock (Conium maculatum) is toxic to humans and animals, usually causing death by respiratory arrest, muscle paralysis, or acute renal failure. [4]

Decedent Profile:
- Middle-aged Caucasian male
- Well-developed (5 feet, 10 inches; 176 pounds)
- History of suicidal ideations, including text messages found on his phone
- History of tobacco use, anxiety, depression, and attention deficit disorder

Samples:
Following the decedent’s autopsy, samplings of his stomach contents and blood were sent to Duquesne University. A vial of the liquid found in a water bottle near the decedent was also sent to Duquesne, in addition to a vial of the dried plant material found within the decedent’s house. The samples were stored in the 4°C cold room until extraction and analysis was performed.

Autopsy Results:
Aside from slight atherosclerosis and global ventricular hypertrophy, postmortem examination revealed no evidence of any significant natural disease process, physical violence, or trauma. Upon the examination of the stomach, approximately 275 cc of unknown leafy green plant material was submerged in a small amount of dark red to brown admixed liquid. There was also a small amount of green leafy material present within the proximal duodenum. However, no pills or capsules were identified in the stomach.

Method Optimization:

Results and Discussion:
- An analytical method was created and optimized that accurately identified the presence of coniine.
- Extraction methods are being further developed in order to analyze the bodily samples taken during the decedent’s autopsy.
- In order to analyze the liquid found at the scene on the GC-MS, 1 mL was dried down for 90 minutes at 60°C in a nitrogen oven. Once the liquid was dried, it was reconstituted with 500 μL of Optima grade Methanol.
- In comparing the chromatograms of the 0.1 mg/ml coniine standard and reconstituted liquid from the scene, there are sharp peaks, with similar intensities, at the same retention time.
- The chromatogram from the liquid at the scene was also found to contain 2-furancarboxylic acid (2-furoic acid), a common food preservative and flavoring agent.
- Botany examination of the leafy material recovered from the decedent’s stomach contents confirmed that the material was consistent with poison hemlock.

Conclusions & Future Directions:
- The chromatogram of the liquid found at the scene was consistent with the chromatogram of the coniine standard, implying that the decedent ingested hemlock.
- The apparent cause of death remains to be intentional hemlock ingestion, to be confirmed following bodily fluid analysis.
- A significantly larger focus should be placed on studying hemlock intoxication, as well as its diagnosis, biological half-life, fatal levels, and human metabolism.

Acknowledgements:
- Sean Fischer
- Stephanie Diz
- Dr. Pamela Marshall
- Dr. Stephanie J. Wiesel
- Duquesne University Forensic Science and Law Program
- Bayer School of Natural and Environmental Sciences
- Duquesne University Women in STEM

References: