



A Survey of Over-the-Counter Substance Stability in Animal Tissues

Marcus Cureton, Dr. Charles Murrieta

Forensic Science Program, University of Nebraska–Lincoln



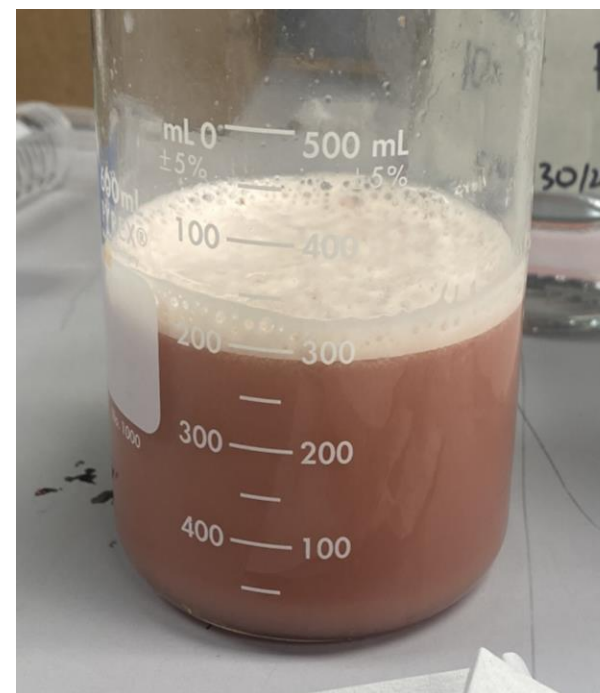
Introduction and Purpose

- When crimes are committed, biological samples obtained as evidence often requires analysis.
- These results can influence court decisions.
- If appealed, samples may need reanalysis in the future.
- It may be assumed that lab results should be similar in the future.
- However, several factors can impact analytical results.
- This study examines the effect of refrigerated storage on concentrations of Ibuprofen and Kratom in biological tissues.

Materials and Methods

- Phosphate-Buffered Saline (PBS)
- Tissues: Cow Liver, Ox Bile, and Porcine Blood
- OTC Substances: Ibuprofen and Kratom
- Sample Prep: Substance spike and internal standard
- General Organic Extraction: Modified Bligh and Dyer (1959) method
- Esterification: Modified Murrieta et al. (2002) method
- GC-MS analysis: results expressed as mg/g of tissue
- Data analyzed using GLM procedure of SAS®

Results: Liver



	0 weeks	2 weeks
Liver- Ibu	95.08	97.46
Liver- Kra	7.74	8.67
	4 weeks	<i>p</i>
Liver- Ibu	76.12	0.90
Liver- Kra	7.06	0.99

Table 1: Liver Ibuprofen and Kratom extracts over time
Figure 1: Initial liver homogenate sample

Results: Bile

	0 weeks	2 weeks
Bile- Ibu	39.61	19.28
Bile- Kra	28.79	2.93
	4 weeks	<i>p</i>
Bile- Ibu	44.96	0.92
Bile- Kra	12.51	0.02

Table 2: Bile Ibuprofen and Kratom extracts over time

Results: Blood

	0 weeks	2 weeks
Blood- Ibu	5.94	-
Blood- Kra	0.96	-
	4 weeks	<i>p</i>
Blood- Ibu	5.40	0.89
Blood- Kra	1.03	0.98



Table 3: Blood Ibuprofen and Kratom extracts over time

Discussion and Future Research

- Discussion:
 - Limited blood supply.
 - No significant difference in ibuprofen concentration.
 - Sample carryover was observed in GC/MS analysis.
 - Kratom active ingredient was not detected.
 - Extraction and esterification efficiency varied.
 - Large variation between and within sample analyses.
 - Unpreserved stored tissue may affect results
 - NIST Forensic Toxicology Subcommittee
 - Each step of any published analytical method must be validated.
 - Proper QA/QC should mean consistency between accredited labs
 - Impact on courtroom decisions
- Future Research:
 - Instrument comparison (GC vs. LC)
 - Extraction process
 - Esterification catalysts and efficiency
 - Single substance focus
 - Single tissue focus

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