U.S. Department of Justice
Drug Enforcement Administration

www.dea.gov

Microgram Bulletin

Published by:
The Drug Enforcement Administration
Office of Forensic Sciences
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

VOL. XXXVIII, NO. 3 MARCH 2005

- INTELLIGENCE ALERT -

FRESH AND DRIED KHAT IN PHOENIX, ARIZONA

The Phoenix Police Department Laboratory Services Bureau (Phoenix, Arizona) recently received two separate submissions of fresh and dried plant materials, suspected khat (*catha edulis*). The first consisted of eight bundles of plant stems and leaves approximately 9-10 inches in length (total net mass 510 grams) wrapped in a paper towel and banana leaf then tied with plant fibers (see Photo 1). The exhibit had been shipped from England directly to a Phoenix apartment via an express mail service (circumstances of seizure not available; not known (to the analyst) whether the sample was cooled in any manner for shipping). The second

Photo 1 (Ruler is 6 inches long)

submission consisted of one exhibit of fresh plant leaves (total net mass 250 grams, see Photo 2) and two exhibits of dried plant leaves "graba" (total net mass 790 grams, no photo). This latter submission was seized from the baggage of a passenger who flew from Ethiopia to Phoenix Sky Harbor Airport, and was not cooled. Since only cathine is controlled in Arizona, both submissions were frozen upon receipt in order to prevent the (natural) decomposition of cathinone to cathine. After acid/base workup and chloroform extraction, analysis by GC/MS showed the presence of both cathinone and cathine in all of the submissions (not quantitated), confirming that they were khat. These are the first submissions of khat seen by the laboratory in eight years, and the first ever submission of dried khat ("graba").

Photo 2 (Ruler is 6 inches long)

* * * * *

- INTELLIGENCE ALERT -

ECSTASY MIMIC TABLETS CONTAINING 5-METHOXY-N-METHYL-N-ISOPROPYLTRYPTAMINE (5-MeO-MiPT) IN WASHINGTON, DC

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a submission of 20 off-white tablets with cherry logos, diameter approximately 8 millimeters, suspected Ecstasy (see Photo 3; note that the color of the tablets is affected by the background - the actual color is off-white). The exhibit was seized by the U.S. Park Police in Washington, DC (circumstances of seizure not reported). Analysis of the tablets (total net mass 3.0 grams) by FT-IR, GC, and GC/MS, however, indicated not MDMA but rather N-isopropyl-5-methoxy-N-methyl-tryptamine (more usually named as 5-methoxy-N-methyl-N-isopropyltryptamine (5-MeO-MiPT); not quantitated). 5-MeO-MiPT is controlled (Schedule I) as an analogue of 5-methoxy-N,N- diisopropyltryptamine (5-MeO-DIPT, also known as "Foxy-Methoxy"). The Mid-Atlantic Laboratory has encountered other 5-methoxylated tryptamines, but this is the first ever submission of 5-MeO-MiPT.

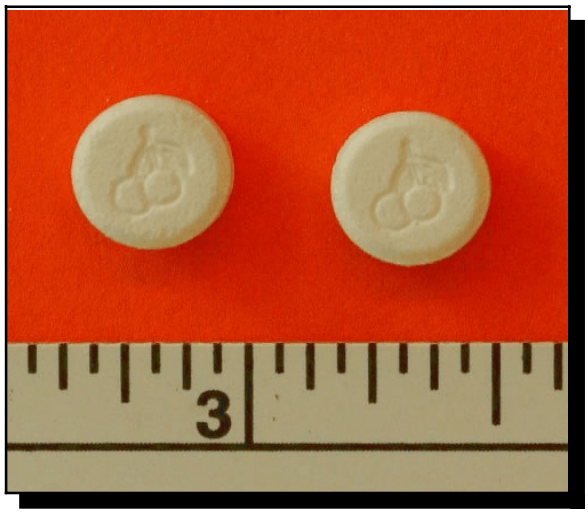

Photo 3

- INTELLIGENCE BRIEF -

OPIUM IN DETROIT, MICHIGAN

The DEA North Central Laboratory (Chicago, Illinois) recently received a large rounded-rectangular mass of a dark brown, gummy/tacky solid ("Tootsie Roll" appearance and consistency), suspected opium (see Photos 4 and 5). The material (total net mass 1,985 grams) was packaged in layers of plastic wrap, a re-sealable plastic bag, and duct tape. The exhibit was seized by the U.S. Customs Service from an individual attempting to enter the United States from Canada at the Detroit, Michigan POE. Analyses by color tests, TLC, and GC/MS indicated morphine, codeine, thebaine, papaverine, meconin, hydrocotarnine, and noscapine, confirming opium (approximate relative ratios based on GC area counts: 100:50:30:25:15:8:7). The North Central Laboratory receives approximately five samples of opium a year; however, this was the largest amount of opium ever received as a single exhibit.

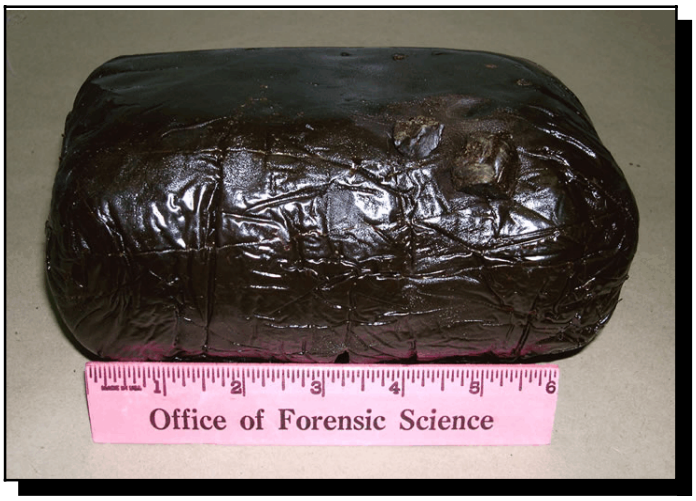

Photo 4

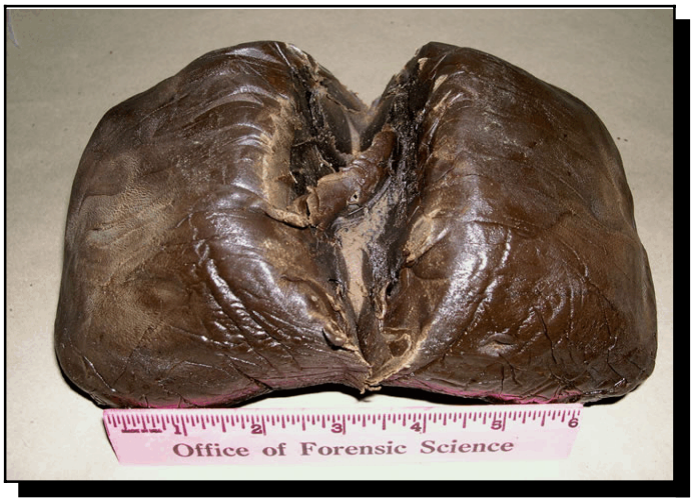

Photo 5

\- - - - - - - - - -

* * * * *

- INTELLIGENCE BRIEF -

VACUUM PACKED, COMPRESSED HASHISH IN LAURIER, WASHINGTON

The DEA Western Laboratory (San Francisco, California) recently received an unusual submission of vacuum-packed, compressed pieces of brown material, suspected hashish. In all, the exhibit included 46 disk-shaped pieces with a diameter of approximately 5 centimeters and a thickness of 1 centimeter, 32 pieces of thin, various sized rectangular pieces, and 2 groups of rectangular pieces stuck together (see Photos 6 and 7, next page). The disks were vacuum-sealed in plastic bags, usually in groups of four, while the flat rectangular pieces were in separate, vacuum-sealed bags. The exhibit (total net mass 1,753 grams) was seized at the Laurier, Washington POE by the U.S. Border Patrol from three individuals who were carrying backpacks of marijuana (Laurier is on Interstate 395 in far northeastern Washington, on the border with

British Colombia, Canada). Analysis by Duquenois-Levine color testing, microscopic examination, TLC, and GC/MS identified THC and various other cannabinoids, confirming hashish (quantitation not reported). This was the first submission of hashish in these shapes to the Western Laboratory.

Photo 6

Photo 7

* * * * *

- INTELLIGENCE BRIEF -

COCAINE IN CANNED MILK CAN IN HUELVA, SPAIN

Photo 8

The Estupeficiens Control Laboratory of the Health Department (Seville, Spain) recently received a submission of six food containers, one of which (canned milk) contained a pasty brownish powder, suspected cocaine (see Photo 8 (best available photo)). The exhibits were mailed from Colombia, and were seized in Huelva (southern Spain) by the Guardia Civil/Anti-Narcotics Enforcement Department. Analysis of the material (total net mass 228.32 grams) by color testing and GC/FID confirmed 31.8 percent cocaine hydrochloride. The other five food containers (labelled as cocoa powder, cocoa cream, and coffee) did not contain any controlled substances. This was the first known seizure of canned cocaine in the city of Huelva.

* *

SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

1. Anastos N, Lewis SW, Barnett NW, Pearson JR, Kirkbride KP. **The rapid analysis of heroin drug seizures using micellar electrokinetic chromatography with short-end injection.** Journal of Forensic Sciences 2005;50(1):37. [Editor's Notes: Presents the title study. Good separation of heroin and various adulterants and diluents was obtained. Contact: School of Biological and Chemical Sciences, Deakin University, Geelong, Victoria 3217, Australia.]

2. Del Signore AG, McGregor M, Cho BP. **1H NMR analysis of GHB and GBL: Further findings on the interconversion and a preliminary report on the analysis of GHB in serum and urine.** Journal of Forensic Sciences 2005;50(1):81. [Editor's Notes: Presents the title study. Spiked samples are included. Focus is toxicological, but the results are pertinent for spiked beverages. Contact: Department of Biomedical and Pharmaceutical Sciences, College of Pharmacy, University of Rhode Island, Kingston, RI 02881.]

3. Levine B, Editor. Various Topics. Principles of Forensic Toxicology (2nd Ed.). AACC Press, Washington, DC, 2003. [Editor's Notes: Includes reviews on Forensic Drug Testing, Spectrophotometry, Chromatography, Mass Spectrometry, Inhalants, and others. Focus is toxicological. No Contact Information.]

4. Li J, Ye L. **Determination of opioids.** Zhongguo Yaowu Yilaixing Zazhi 2004;13(3):235. [Editor's Notes: A minor overview, including discussions of the use of TLC, immunoassay, and GC/MS, for the title study. This article is written in Chinese. Contact: Teacher's College, Beijing Union University, Beijing 100011, Peop. Rep. China.]

5. Meyers JE, Almirall JR. **Analysis of gamma-hydroxybutyric acid (GHB) in spiked water and beverage samples using solid phase microextraction (SPME) on fiber derivatization/gas chromatography-mass spectrometry (GC/MS).** Journal of Forensic Sciences 2005;50(1):31. [Editor's Notes: Presents the title study. Contact: International Forensic Research Institute, Department of Chemistry, Florida International University, Miami, FL 33199.]

6. Person EC, Meyer JA, Vyvyan JR. **Structural determination of the principal byproduct of the lithium-ammonia reduction method of methamphetamine manufacture.** Journal of Forensic Sciences 2005;50(1):87. [Editor's Notes: Identifies the title byproduct (1-(1',4'-cyclohexadienyl)-2-methylaminopropane) via comprehensive spectral and chromatographic methodologies. Contact: Washington State Patrol, Marysville Crime Laboratory, 2700 116th Street NE, Suite P, Marysville, WA 98271.]

7. Rosner P, Quednow B, Girreser U, Junge T. **Isomeric fluoro-methoxy-phenylalkylamines: A new series of controlled-substance analogues (designer drugs).** Forensic Science International 2005;148(2-3):143. [Editor's Notes: Provides an overview of and comprehensive spectral data for a series of fluoroamphetamines, fluoromethoxyamphetamines, and a few similar compounds. Contact: Landeskriminalamt Schleswig-Holstein, Sachgebiet Toxikologie/Betaubungsmittel, Muhlenweg 166, D-24116 Kiel, Germany.]

8. White P, Editor. **Crime Scene to Court: The Essentials of Forensic Science** (2nd Ed.). Royal Society of Chemistry: Cambridge, UK, 2004 [Editor's Notes: No further information or Contact information was provided in the abstract.]

9. Yamaguchi M, Saito T, Horiguchi Y, Ogawa K, Tsuchiya Y, Hishinuma K, Chikuma T, Makino Y, Hojo H. **Preparation of monoclonal antibodies reactive to a hallucinogenic drug, psilocin.** Journal of Health Sciences 2004;50(6):600. [Editor's Notes: Focus is on detection and identification of "magic mushrooms". Contact: Department of Hygienic Chemistry, Showa Pharmaceutical University, Tokyo, Japan 194-8543.]

10. Zeng L. **Test paper for detecting morphine.** (Patent) Chemical Abstracts 2005:21218.

Additional References of Possible Interest:

1. Almirall JE. **Forensic chemistry education.** Analytical Chemistry 2004;77(3):69A. [Editor's Notes: An overview, including projected future needs. Contact: Department of Chemistry and Biochemistry, Florida International University, University Park, Miami, FL 33199.]

2. Horrocks M. **Sub-sampling and preparing forensic samples for pollen analysis.** Journal of Forensic Sciences 2004;49(5):1024. [Editor's Notes: The applications include a brief discussion of illicit drugs. Contact: Microfossil Research Ltd, 31 Mont Le Grand Rd., Mt. Eden. Auckland, New Zealand.]

3. Kelani KM. **Selective potentiometric determination of zolpidem hemitartrate in tablets and biological fluids by using polymeric membrane electrodes.** Journal of the AOAC International 2004;87(6):1309. [Editor's Notes: Presents the title study, using four different polymeric membrane sensors. Contact: Cairo University, Faculty of Pharmacy, Department of Analytical Chemistry, Kasr el Aini St., PO Box 11562, Cairo, Egypt.]

4. Kuila DK, Lahiri SC. **Interactions of morphine and codeine with benzoic acid and sunstituted benzoic acids.** Journal of the Indian Chemical Society 2004;81(11):928. [Editor's Notes: Investigates the complexes formed by the title compounds. The focus of this study is not clear from the abstract. Contact: Central Forensic Science Laboratory, Kolkata 700 014, India.]

5. Thevis M, Opfermann G, Schaenzer W. **N-Methyl-N-trimethylsilyltrifluoroacetamide synthesis and mass spectrometric characterization of deuterated ephedrines.** European Journal of Mass Spectrometry 2004;10(5):673. [Editor's Notes: Presents the title study. The results are of interest in elucidating the fragmentation mechanism for ephedrine. Contact: Institute of Biochemistry, German Sport University Cologne, Cologne 50933, Germany.]

6. Tomaszewski W, Gun'ko VM, Leboda R, Skubiszewska-Zieba J. **Interaction of amphetamine and its N-alkyl-substituted derivatives with micro- and mesoporous adsorbents in polar liquids.** Journal of Colloid and Interface Science 2004;282(2):261. [Editor's Notes: The title technique is used to concentrate amphetamines from "dilute aqueous solutions" (may be biological fluids - not clear in abstract). Contact: Internal Security Agency, Department of Criminalistics,, 1-go Sierpnia 30 A, Warsaw 02-134, Pol.]

* *

THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

May 9 - 13, 2005
July 11 - 15, 2005
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

* * * * * * * * * * * * * * * * * * * * * * * * *

SCIENTIFIC MEETINGS

1. Title: 17th Triennial Meeting of the International Association of Forensic Sciences (IAFS) (First Bimonthly Posting)
Sponsoring Organization: International Association of Forensic Sciences
Inclusive Dates: August 21 - 26, 2005
Location: Hong Kong Convention and Exhibition Centre (Hong Kong)
Contact Information: See Website
Website: www.iafs2005.com

* * * * * * * * * * * * * * * * * * * * * * * * *

Computer Corner #192

Thoughts for the Future

by Michael J. Phelan
DEA Digital Evidence Laboratory

Over the past two years, the forensic science community has formally recognized the discipline of digital evidence and some of its specializations, including computer forensics, audio analysis, video analysis, and digital imaging analysis. The American Society of Crime Laboratory Directors / Laboratory Accreditation Board (ascld-lab.org) has already accredited several Federal and state crime laboratories in the digital evidence sub-discipline (or in some instances, dedicated digital evidence laboratories). Another forensic recognition body is the American Academy of Forensic Sciences (aafs.org), which has recently held workshops on the topic. Undoubtedly, other forensic organizations will soon follow suit. I expect that most digital evidence examination organizations will be accredited by the end of this decade.

However, despite these advances, the vast majority of the practitioners remain isolated within their organizations, and are not even a recognized department in those organizations. In many such cases, the computer forensic examination function is only a part time task, with minimal support. Thus, equipment and tools are limited, budgets are almost non-existent, training (if any) is basic and of short duration (typically two weeks or less), peer review of examination results is rare, examination tools are not tested (validated), and there is no meaningful or regular proficiency testing program.

The challenge for management - whether a police chief, sheriff, investigative agency director, or crime laboratory director - is to ensure that their organization's digital evidence examination work product is thorough, consistent with accepted best practices, and court-admissible. It is important to define the organization's requirements in detail, establish policies and budgets, and act. Expectations of the court system, and possibly the state legislatures, and (inevitably) defense attorneys, will challenge law enforcement to provide the same quality in their digital evidence work product as that provided in other, more traditional forensic disciplines.

I have seven thoughts for consideration for those law enforcement organizations that are considering initiating or expanding digital evidence programs:

First, prior to starting a program, crime laboratory directors should meet with the heads of the investigative agencies that they service, to decide how best to organize and support digital evidence functions.

Second (where appropriate), regional associations should be considered as a means to leverage scarce technical resources and budgets.

Once the program has been initiated:

Third, quality review checks of individual examiner work products must be implemented as soon as possible. This can be as simple as one trained examiner reviewing the work of another examiner. In instances where there is only one examiner present, then another trained examiner from another agency should perform the review.

Fourth, an independent certification authority for individual examiners needs to be established. The certification should encompass critical elements such as quality control, examination best practices, and proficiency testing. This authority must be independent of any training, software, or hardware vendor. Re-certification criteria must be substantive and required on a regular, scheduled basis.

Fifth, laboratories with digital evidence examination services need to become accredited.

Sixth, law enforcement

organizations providing only small-scale or part-time digital evidence examination support (i.e., that is not a formal department of their forensic laboratory system), need to ensure that their practitioners are qualified, regularly tested, and currently certified.

And seventh, academia, private industry, government training program managers, and quasi-governmental technical associations, need to meet on a regular basis to exchange points of view and develop a consensus for a national cyber forensic agenda. Computers and associated digital electronic devices will likely eventually become the second largest type of forensic evidence (behind fingerprints) collected at a crime scene, or as evidence seized in an investigation, so such a consensus is critical.

The dramatic advances in digital evidence examination for law enforcement purposes over the past 15 years is a tribute to the efforts of many individuals who identified the growing requirements, and got the job done. There appears to be a quickly growing consensus on digital evidence technical best practices. The Scientific Working Group on Digital Evidence (swgde.org), the International Association of Computer Investigation Specialists (iacis.org), and the International Organization of Computer Examiners (ioce.org), have each published recommended guidelines. The current challenge for law enforcement is ensuring that basic quality control mechanisms are observed at all levels. Decentralization of the digital evidence examiners at one or two person locations is a management challenge, but one that can be solved. Both crime laboratory directors and law enforcement heads should review their current practices and organizational responsibilities and prepare for the future (which, as we all know, is already here).

Questions or comments:
E-mail: Michael.J.Phelan -at-usdoj.gov

* * * * *