

08-74777

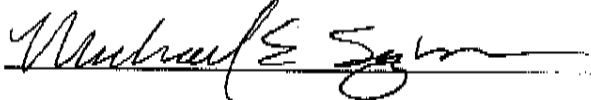
**Air Analysis Results: Caylee Anthony Missing Child Investigation**

Michael E. Sigman, Ph.D., Assistant Director for Physical Evidence  
National Center for Forensic Science  
University of Central Florida, Orlando, FL

*Participating Analysts:*

C. Douglas Clark, B.S., Senior Research Technician

Mary R. Williams, M. S., Coordinator: Research Programs and Services

*Analysis conducted for the Orange County Sheriff's Office, Orlando, FL.**Report Date: July 30, 2008*


7/30/2008  
Date

**Executive Summary:**

(Samples Collected and *Analyses performed*) The following samples were obtained from the trunk of a white Pontiac, held in the Forensics Unit at the Orange County Sheriff's Office.

- Sample 1: Approximately 1 liter (L) of air removed by a gas-tight syringe and placed into a Tedlar polymer bag through a rubber septum.
- Sample 2: Approximately 300 milliliters (mL) of air removed by a gas-tight syringe and placed into a Tedlar polymer bag through a Teflon-lined septum.
- Sample 3: A single solid phase micro-extraction (SPME) fiber coated with a 65  $\mu\text{m}$  thick dimethylsiloxane/carboxen adsorbent layer was placed in the trunk for a period of approximately 40 minutes.
- Sample 4: One 1 centimeter (cm) x 0.5 cm activated carbon strip, exposed for approximately 40 minutes.
- Sample 5a – Sample 5d: Four SPME fibers coated with a 65 micron ( $\mu\text{m}$ ) thick dimethylsiloxane/carboxen adsorbent layer were placed in the trunk for a period of approximately 7.5 hours.
- Sample 6: Two 1 cm x 0.5 cm activated carbon strips, exposed for approximately 7.5 hours.

Samples 1 and 2 were collected from the rear of the automobile with the trunk open approximately 2 inches. Samples 3 – 6 were collected from within the closed trunk. The trunk lid was opened a minimal amount to allow the collection devices to be placed in the center of the trunk, so that air was sampled from throughout the trunk. All samples were collected by Sigman and Clark. Samples 2, 3, 4, 5a, 5b and 6 were analyzed by gas chromatography – mass spectrometry (GC-MS). Samples 2, 3, 4, 5a and 5b were analyzed by Sigman and Clark. Sample 6 was analyzed by Williams.

(*Findings*) Sample 1 was not analyzed at NCFS. Samples 2 – 4 provided evidence for low concentrations of volatile organic chemicals in the trunk of the automobile. Samples 5a and 5b provided evidence for the presence of gasoline vapors in the trunk, as determined by comparison of the GC-MS data to data of the same type in an ignitable liquids

database maintained by the National Center for Forensic Science (NCFS). In addition to the gasoline components, Samples 5a and 5b also contained dimethyl disulfide, tetrachloroethene and chloroform. Samples 5c and 5d were not analyzed by NCFS. Analysis of Sample 6 also provided evidence for the presence of gasoline vapor in the automobile trunk.

*(Interpretation of findings)* Dimethyl disulfide, tetrachloroethene and chloroform are known to be liberated from decomposition of human remains. These three compounds were not found in a representative gasoline sample in the NCFS database. Dimethyl disulfide also occurs naturally in cabbage and onion. Tetrachloroethene is used in dry cleaning and may be used in spot removers. Chloroform may be used as a degreaser and may be formed through the reaction of chlorine bleach with some organic chemicals. Based on these results, it is my opinion that the presence of dimethyl disulfide, tetrachloroethene and chloroform does not conclusively demonstrate that human decomposition was previously present in the automobile's trunk due to other possible sources of these materials.

**FORENSIC REPORT**  
**Orange County, Orlando, Florida**  
**Preliminary Report**

**TO:** Detective Yuri Melich, Orange County Sheriff's Dept, Orlando, Florida  
Investigator Mike Vincent, Orange County Sheriff's Dept, Orlando, Florida

**FROM:** Arpad Vass, Ph.D., Research Scientist, Oak Ridge National Laboratory, Oak Ridge, TN.

**SUBJECT:** Odor analysis of trunk carpet sample

**DATE:** August 26, 2008

On July 24, 2008 Investigator Mike Vincent of the Orange County Sheriff's Department sent me a carpet sample from the trunk of a 1998 Pontiac Sunfire to determine if the odor present on the sample and in the trunk of the vehicle was indicative of a decompositional event. These samples were sent to me in reference to research we have been performing since 2002 in an attempt to identify the chemical composition of human decomposition odor. This research has resulted in the development of a Decompositional Odor Analysis database (References 1-2).

The carpet sample was enclosed in a sealed metal can. A preliminary analysis was performed by collecting a small (0.8 ml) sample of air from the can and injecting the air into a gas chromatograph/mass spectrometer. Several compounds were observed in this sample; however, it was deemed necessary to concentrate the sample in order improve the sensitivity for the lower abundance compounds.

The sample was removed from the metal can and placed in a Tedlar bag for several days at 35 degrees C and allowed to off-gas into the Tedlar bag. The analytes from several ml of gas from the Tedlar bag were concentrated by cryo-focusing them with liquid nitrogen at the head of a gas chromatograph/mass spectrometer. Preliminary results of this analysis are summarized in the attached Table. Compounds in the sample were tentatively identified by mass spectral library match. Standards of the tentatively identified compounds have not been run. It is important to note that gasoline was found in the vehicle trunk which presented a significant chromatographic signal and overlapped with many chemicals typically observed in decompositional events. Additionally, a decomposing pizza was also found in the trunk. It is not known what impact this had on the results of this preliminary study. Finally it is unknown what compounds, if any, the spraying of a luminol-type product (BluStar) in the trunk might have had on the detected compounds.

Of the 54 chemicals identified (many gasoline components detected are not listed in the Table), 43 (79.6%) are consistent with decompositional events. Only nineteen of these overlap with gasoline constituents. Common fluorinated compounds usually associated with human decomposition were not detected. It is possible, although this has not been

studied, that a 3 year-old child may not have had sufficient time (many years) to ingest enough fluorinated compounds for them to be incorporated into tissue and then to appear in the decompositional breakdown of soft tissue and bone. Additionally, several of the identified compounds are typically associated with anaerobic decomposition. While the actual significance of this not known, it indicates that any type of decompositional event that might have been associated with the odor in the trunk of the car occurred under deprived oxygen conditions (the pizza was not wrapped and most likely was decomposing aerobically).

While these are very preliminary results, the results at this point appear to be consistent with a decompositional event having occurred in the trunk of the vehicle. This does not rule out the possibility that an animal carcass (had to be wrapped to produce anaerobic compounds), rotting meat, paint, varnish, cleaners, degreasers, or garbage were transported in the trunk at some time that may have contributed to the observed chemical compounds.

It is recommended that additional samples be analyzed including air samples of the vehicle interior, a clean control sample, a control sample sprayed with BluStar and if possible, a sample of air from the pizza that was found in the vehicle trunk.

Arpad Vass, Ph.D.  
Research Scientist/Forensic Anthropologist

#### References:

- Vass, A.A., Smith, R.R., Thompson C.V., Burnett, M.N., Dulgerian N., Eckenrode B.A. Odor Analysis of Decomposing Buried Human Remains. *J. Forensic Sciences*, 53 (2): 384-392, March 2008.
- Vass, A.A., Smith, R.R., Thompson C.V., Burnett, M.N., Wolf D.A., Synstelien J.A., Eckenrode B.A., Dulgerian N. Decompositional Odor Analysis Database. *J. Forensic Sciences*, 49 (4): 760-769, July 2004.
- Cole, G.M. 1994. Assessment and Remediation of Petroleum Contaminated sites. Lewis Publishers, Boca Raton, FL, 360p.
- Cummings, W.M. 1977. "Fuel and Lubricant Additives – I: Fuel additives." *Lubrication*, Vol 63, No. 1: 1-12.
- Irwin, R.J., M. Van Mouwerik, L. Stevens, M.D. Seese, and W. Basham. 1997. *Environmental Contaminants Encyclopedia*. National Park Service, Water Resource Division, Fort Collins, CO.

**Other Subjects**

**Narrative**

API Roy met face to face with Shirely Plesea at her current residence located at 2708

[REDACTED]

addressed with her. Mrs. Plesea stated that her granddaughter, Casey Anthony, who resides with her daughter, Cynthia Anthony, at 4937 Hope Springs Drive, Orlando, Florida. Mrs. Plesea stated that her granddaughter, Casey Anthony did make an unauthorized transfer from her husband's bank account on 04/10/2008 in the amount of \$354.00 to pay a cell phone bill. However, the bank has reimbursed the funds. Mrs. Plesea stated that she has discussed this with the FBI and the lead investigators in her greatdaughter disappearance case. Mrs. Plesea showed the API the bank statement with the unauthorized transfer. Mrs. Plesea stated that it appears that Casey Anthony got their routing number from a birthday card that they sent her in March. Mrs. Plesea stated that she does not want to press charges. Mrs. Plesea stated that her granddaughter is in enough trouble at this time. Mrs. Plesea stated that she did not need services at this time. API did not see a need for services at this time.

[REDACTED]	[REDACTED]
Worker Creating Note:ROY, ROBERT, L	Worker Making Contact:ROY, ROBERT, L

**Note Information**

Contact Begin date:09/13/2008 12:45 PM	Contact End date:
Category:Adult Investigation	Type:Commencement (Initial)
Worker Activity Code:	

**Contact Information**

[REDACTED]

**Subjects Contacted**

- Plesea, Shirley; 09/13/2008 12:45 PM
- Plesea, Alexander; 09/13/2008 01:15 PM



# ORANGE COUNTY SHERIFFS OFFICE

Case Number: 08-074777

COMPUTER FORENSICS REPORT

Detective Sandra G. Cawn

## Summary of findings after August 20, 2008

There are two user profiles being used on the HP desktop computer; "owner" and "casey". There is one user profile on the Compaq laptop; "bobby". To determine whether or not either of these user accounts requires a password to log on, the software application "SAMinside" was utilized to analyze two Registry files; SAM and System. The HP computer "casey" account and the Compaq laptop computer "bobby" account require no logon passwords. The "owner" account on the HP desktop computer has an assigned password of "rico23" that was set on May 14, 2008.

Detective Melich requested a keyword search for "chloroform" be conducted. Several hits were located in unallocated space (deleted files) on the HP desktop computer for the words "chloroform" and "chloraform". Sgt. Kevin Stenger, Supervisor of the Computer Crimes Lab, determined that the type of files that contain this text belong to the file structure for Mozilla Firefox Internet history files. In order to extract these deleted Internet history records from the unallocated area of the disk, the file header was located at file offset 8240328704 and the file footer at file offset 8243667306. All the data starting with file offset 8240328704 and ending at file offset 8243667306 was exported to the 08-074777\Evidence\Internet History\HP Desktop folder as "Firefox Header.dat". This data was then imported into Netanalysis for examination. The Netanalysis report was exported and saved as a comma delimited file to the 08-074777\Evidence\Internet History\HP Desktop folder as "deleted Firefox HP computer". The comma delimited file may be viewed using Excel.

The Excel spreadsheet displays, in column format, the Internet URL page, the files' first accessed and last accessed dates and times, an indicator of whether or not the URL was actually typed by the user, and how many times the web page was visited. Sites visited more than once will display different dates and times in the date/time columns.

When searching for the word "chloroform" within the Excel spreadsheet, it was discovered that Internet searches were conducted by a user using the Google search engine. The spreadsheet was filtered for Google searches only. On Monday, March 17, 2008 between the hours of 13:43:41 and 13:55:34, google searches were conducted for the words "chloraform", "alcohol", "acetone", and "peroxide". On Friday, March 21, 2008 between the hours of 14:16:30 and 14:28:18, Google searches were conducted for "how to make chloraform", "how to make chloroform" [spelled correctly], "self defense", "household weapons", "neck breaking", and the word "shovel".

In addition to the Google searches, Wikipedia searches were conducted on March 17, 2008 between the hours of 13:53:25 and 13:58:38 for the words "inhalation", "chloroform", "Alcohol", "Acetone", "peroxide", "hydrogen peroxide", and "death". Also, on Friday, March 21, 2008 between the hours of 14:16:34 and 14:28:26 hours, a Wikipedia search was conducted for the word "Shovel". Also on the 21st of March were searches using other web sources such as blogspot.com,

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# ORANGE COUNTY SHERIFFS OFFICE

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Case Number: 08-074777

## COMPUTER FORENSICS REPORT

Detective Sandra G. Cawn

sci-spot.com, druglibrary.org and instructables.com for the words "making weapons out of household products", "chloroformhabit", "chloroform", "how to make chloroform", and "chloro2".

Mozilla Firefox and Safari Internet browsers were also being used on the laptop computer. The History.dat files for the user "bobby" were imported into Netanalysis and examined for the same search terms as for the HP computer. None were noted.

The Internet History for each user on each computer was extracted and analyzed using Netanalysis. The results were exported and saved as comma delimited files to the 08-074777\Evidence\Internet History folder. Each of these files may be viewed using Excel.

A timeline history for the HP desktop computer use was conducted for June 16th and 17th, 2008. The timeline shows all files for the computer pertaining to last accessed, files created, last written, entry modified, and files deleted. For the 16th, there is no computer activity between the hours of 0100 and 0700, the 0900 hour, the noon hour and again between 1500 and 2300 hours. Regarding the 17th of June, there was no computer activity in the 0200 hour, between 0500 and 0800, 0900 to 1200 hours and again between 1500 and 2300 hours. A screen capture of the timeline as presented in Encase was saved to the 08-074777\Evidence folder as Timeline HP.JPG.

A timeline history was also conducted for the laptop computer for June 16th and 17, 2008. Several system files were accessed during the 1600 hour block on the 16th, however no user activity was noted for that day. Regarding the 17th, several system files were accessed during the midnight hour and again during the 1400 -1500 hours. There is Safari Internet activity during the 1600 hour and other user activity between 1900 and 2300 hours. A screen capture of the Compaq laptop computer timeline as presented in Encase was saved to the 08-074777\Evidence folder as Timeline Compaq.JPG.

On October 20, 2008, Detective Melich requested that a keyword search for "death" be conducted. What appears to be a deleted yahoo web mail fragment containing the word "death" was located on the HP desktop computer and bookmarked. A keyword search for "Universal" was also requested. Email and fragments of what appear to be yahoo webmail were located and bookmarked. These bookmarks are located in the "Unallocated Space" bookmark.

Detective Melich requested that a keyword search for "hopkins" be conducted. References to a Facebook profile for Jeffery Hopkins, ID# 707917422 were located on both computers.

On August 21, 2008, Detective Melich submitted a compact disc labeled "pics from John Azzilonia". Detective Melich requested that the EXIF data from the image files be extracted for analysis. The image files were bookmarked and saved to the 08-074777\Evidence\pictures from John Azzilonia folder.

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TOTAL P.08