

Tiny Blue Particles Link Suspect to Elderly Homicide Victim

Abstract:

A ninety-one year old woman is found sexually assaulted and murdered in her Deerfield Beach, Florida home. Unusual blue particles found on the suspect's clothing linked him to the crime scene. These particles were analyzed by polarized light microscopy, microspectrophotometry and micro-Fourier Transform Infrared Spectroscopy. This case exemplifies the value of microscopic traces of evidence that suspects are not even aware they left behind.

Materials and Methods:

Debris was searched using a Bausch & Lomb stereoscope with a 10X – 70X magnification capability. Particles were mounted in Permount and examined by Polarized Light Microscopy with both crossed and uncrossed polars on a Leitz - Laborlux 12 POLS comparison microscope. Color analysis was conducted with a Microspectrophotometer, Model SEE 1000 at 20X magnification. Finally, the particles were analyzed by Micro-FTIR on a Mattson Polaris FTIR Spectrometer equipped with a Quantum Infrared Microscope.

Introduction:

Scene 1

On Thursday July 25th, 2002 the Broward Sheriff's Office (BSO) Crime Scene Unit (CSU) was dispatched to a possible homicide in Deerfield Beach, Florida. The victim was a 91 year old white female who had been found dead that morning by her elderly son. The victim had a large laceration across her neck and a bruise near her right eye. She was positioned as shown in

Figure 1 with her nightgown pulled up to her waist. A pair of underwear was located near the inside of her lower left leg. Note in the photograph that the bed was made and her legs were spread apart. Over fifty items of evidence were collected from this scene including the comforter, victim's clothing, and "sticky note" lifts of her skin.

Scene 2

Friday July 26th, 2002 a tip came in from a Mobil gas station attendant. The gas station is located 1.1 miles from the scene of the homicide. The attendant stated that on Thursday the 25th he observed a black male changing his clothes in the unisex bathroom. After hearing of the murder nearby he became suspicious and called to report what he had seen. BSO/CSU responded and found numerous articles of wet clothing and a red cloth in the trash can (**see Figure 2**).

BSO Lab / Trace Evidence Unit

While processing the clothing in **Figure 2** over white butcher paper a significant quantity of blue particulate was observed to be falling out of the clothing onto the paper. The particles had a polymeric texture and appeared flat and of irregular shapes (**see Figure 3**). Not knowing what the particles were, this analyst went to talk to Crime Scene Detective Lori Bell about the case and was given the information documented above about the two scenes. The detectives believed that the sexual assault occurred on the bed where the victim was found. Given this scenario, and based on how much particulate was coming off the clothing, one would certainly expect to find some of the blue particles on the comforter if these were the assailant's clothes.

The comforter was signed out of evidence and processed (in a different room / on a different day) for trace evidence. Several Petri dishes of debris (mostly hair) was collected and examined by stereomicroscope. Found amongst the debris were several blue particles (**see Figure 4**). More blue particles were also found on the lifts from the victim's skin.

Results / Discussion:

Figures 5 and 6 show blue particles recovered from the clothing and the victim's bedding side by side under both crossed and uncrossed polars at 250X and 100X magnification respectively. At this point, the identity and source of the particles was still unknown; however, this analyst was sure she had never seen anything like them in the past. Note the blue chips that go through the material and the anisotropic inclusions.

Analysis by microspectrophotometry in the visible region showed the transmission spectra of the particles to be indistinguishable one from the other as illustrated in **Figure 7**. The particles were rolled flat and placed on a KBr window for transmission FTIR analysis. The FTIR spectra, which are shown in **Figure 8**, are the same for particles from both sources and indicate that the polymer is polyethylene based. Convinced that the particles found on the comforter had the same microscopic and spectroscopic properties as those found on the clothing from the gas station, the question of where they came from still needed to be answered.

In the meanwhile, the Latent Print unit identified a suspect, Kevin Moore, from an AFIS quality print Detective Bell lifted off a roll of clear packing tape inside the residence. Homicide detectives learn that Kevin Moore lived with and worked for his uncle applying Diamond Brite to swimming pools. He was a crack cocaine addict and within a day or so of the homicide his uncle had kicked him out of the house. A video on the internet showed that mixing the colored diamond bright with the cement creates a cloud of the materials. It seemed this could be the source of the mysterious particles. The suspect's uncle provided some Diamond Brite samples and with a quick look at them it was obvious the particles in the clothing and on the bedding did not come from Diamond Brite (**Figure 9**). The homicide detective went to the jail and asked him

“what are those blue particles on your clothing from”? He informed that they use a blue tarpaulin to cover the equipment at his uncle’s company and that it has degraded from being in the sun and that these blue particles get all over anyone handling it. A sample of the tarpaulin was requested from the uncle, who up until now had cooperated. He refused.

The homicide detective did not seek a warrant because about this time the suspect confessed he had committed the crimes but claimed it wasn’t his fault because of his low IQ. The victim’s family did not want to pursue the death penalty so the State ultimately settled for “life in prison”. It turns out that after being kicked out of his uncle’s house, Kevin Moore went and asked the victim for money. He knew her because he had done some lawn work in the past. She refused so he came back that night and entered through a door she left ajar for her cats. He had brought the packing tape to tie her up but decided to choke her with a belt which was found broken at the scene. Ultimately, he slit her throat and that was the cause of death with asphyxia as a contributor.

In addition to the trace evidence, his fingerprints and seminal fluid put him at the scene. In this case the trace evidence was valuable in that it showed a link between the suspect and victim before the DNA results were back and let investigators know they were on the right track. Had it gone to trial he may have explained his print on the tape based on having done work there in the past, but even if there had not been any DNA evidence, this analyst believes the unusual blue particles would still have made a compelling case against him.

Conclusions:

In today’s world suspects are becoming increasingly more educated about forensic evidence. It is not uncommon to have rapes in which the suspect wears a condom and takes it

with him from the scene or to have a suspect wiping down surfaces where latent prints may have been left. This case exemplifies the value of trace evidence in that the suspect cannot clean up what they cannot see and didn't even know they left behind.

References:

None

Acknowledgment:

The author would like to thank Detective Lori Bell for providing the crime scene photos and details, her help in 2002 collecting the evidence from the comforter and most of all her endless dedication to the victims of violent crime.

Figures and Captions



Figure 1 – Victim on Bedding (Scene 1)



Figure 2 – Clothing Recovered from Mobil Station (Scene 2)

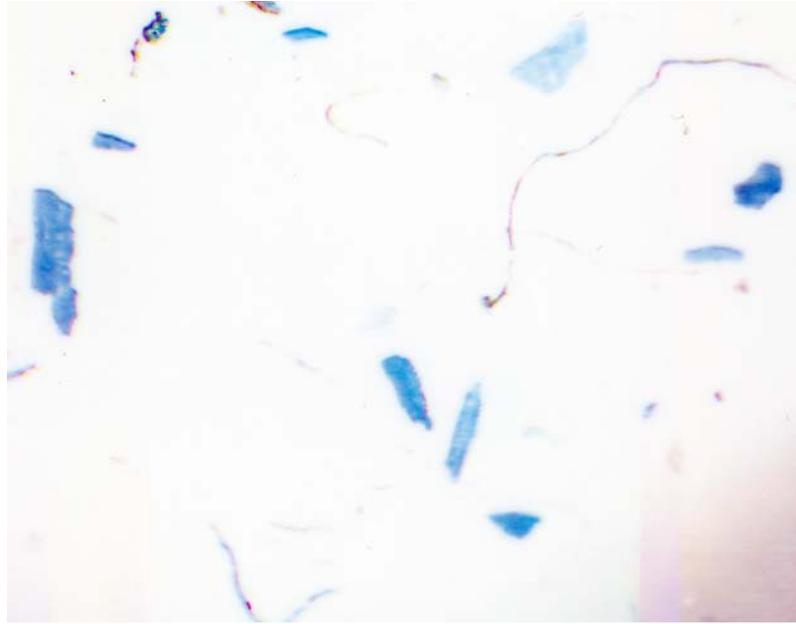


Figure 3 – Particles from Clothing (40X)

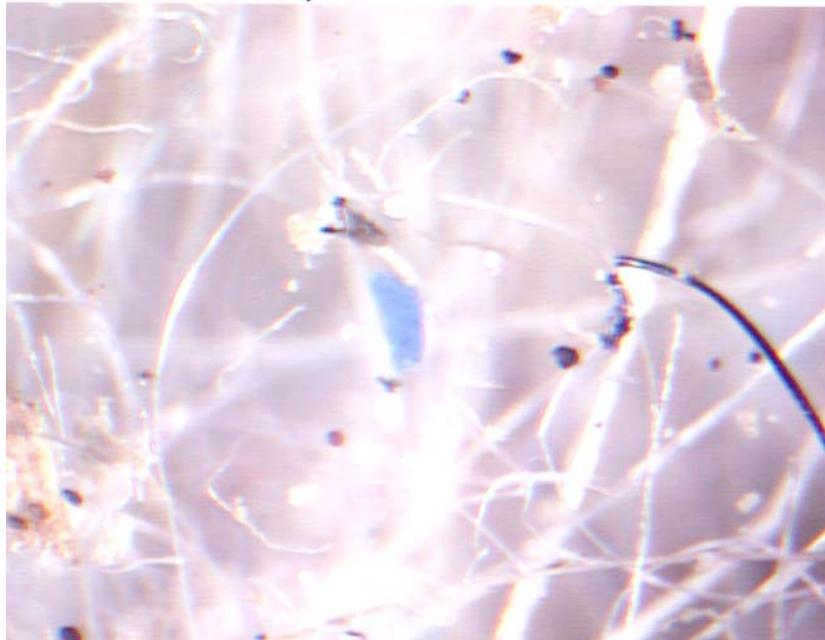


Figure 4 – Particle from Victim's Bedding (40X)

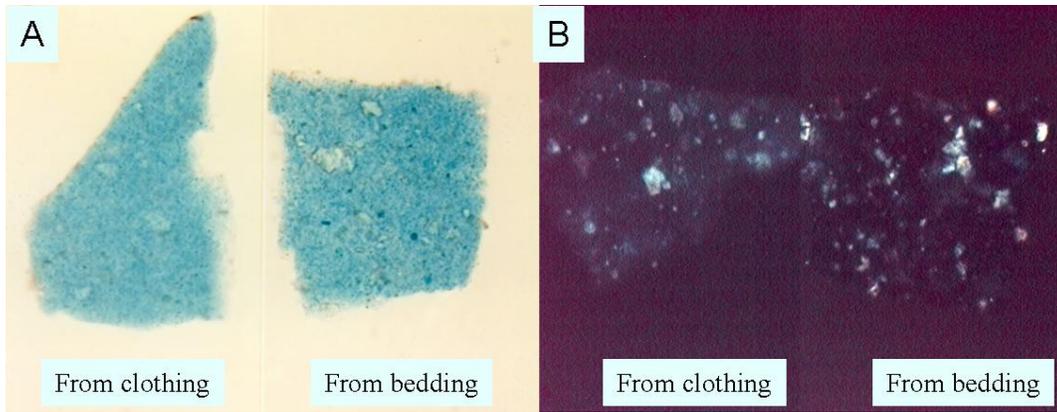


Figure 5 – Particles from Clothing and Bedding Viewed with Polarized Light under (A) Uncrossed and (B) Crossed Poles (250X)

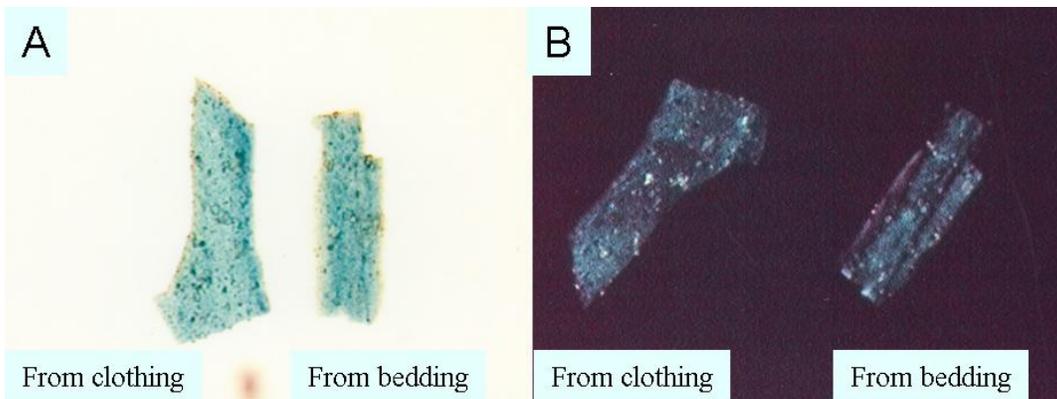


Figure 6 – Particles from Clothing and Bedding Viewed with Polarized Light under (A) Uncrossed and (B) Crossed Poles (100X)

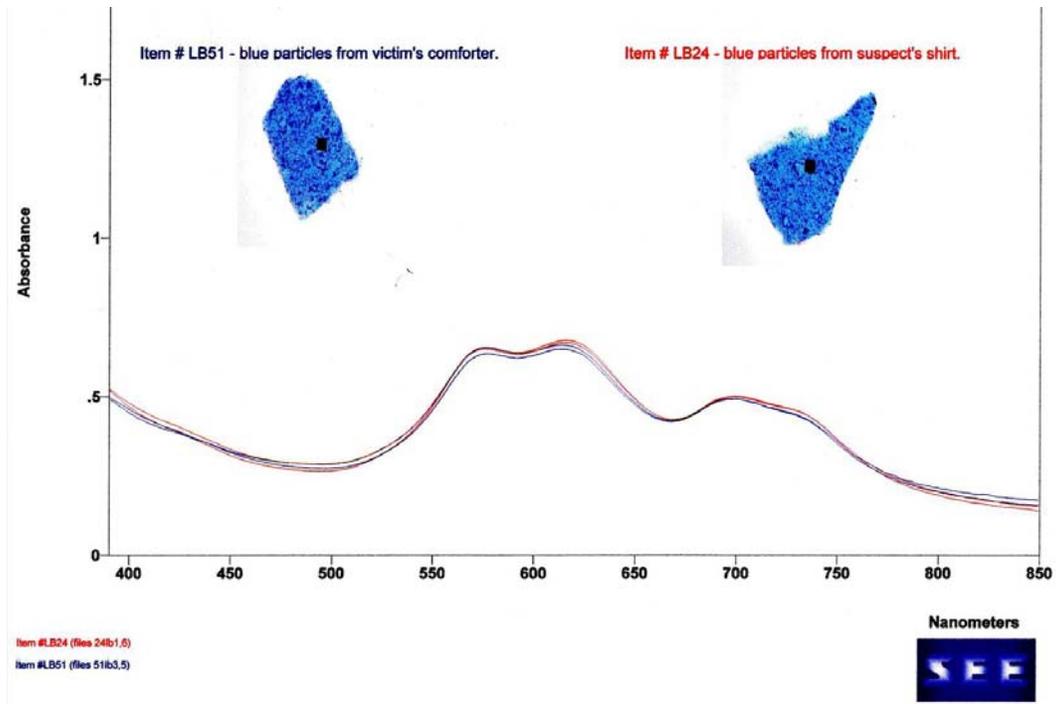


Figure 7 – Transmission Spectra via Microspectrophotometry in the Visible Region

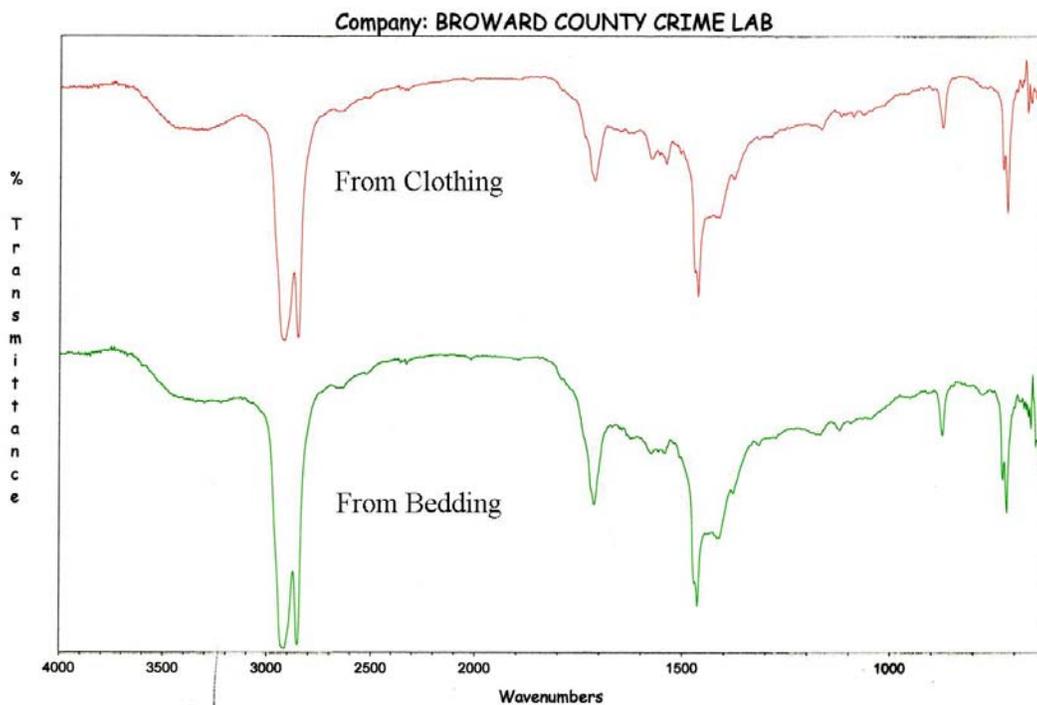


Figure 8 – FTIR

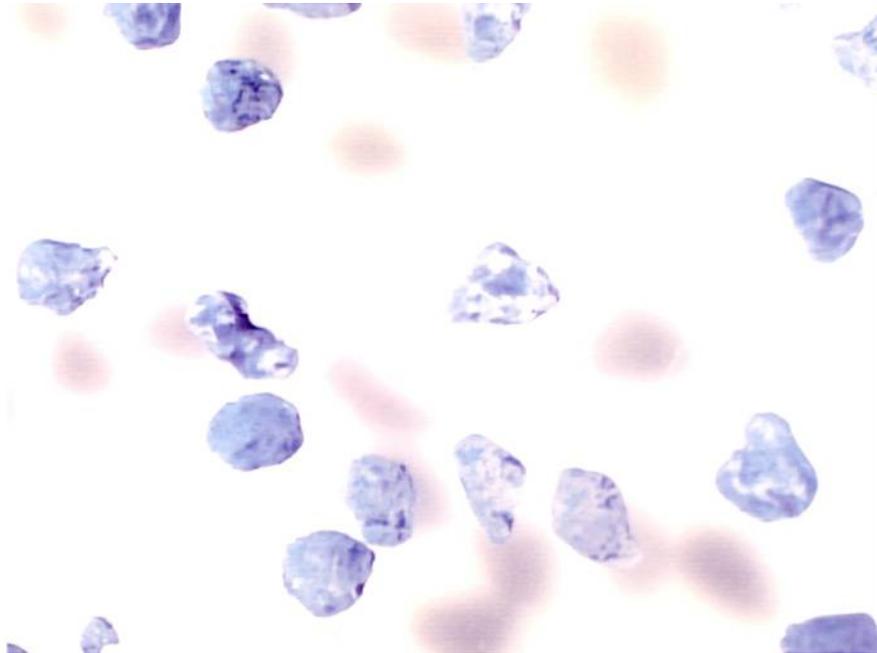


Figure 9 – Diamond Brite (20X)