

DNA off Spent Shell Casings a Matter of Getting in the Nooks and Crannies

04/25/2018 - 12:22pm

by Seth Augenstein

DNA



Seth

Augenstein

Senior Science Writer

@SethAugenstein

Full Bio >

The Bardole Method is a new technique to wash down shell casings in sterile solution, then filter the skin cells that are jostled loose in the process for potential DNA evidence. (Photo: Courtesy of Francine Bardole)

Getting DNA off spent shell casings, that of whoever loaded the firearm, is not a given. Whether it's burned off with the heat from the firing of the weapon, or just too smooth a surface to collect skin cells, getting a genetic profile from swabbing alone off this most crucial piece of evidence is a forensic challenge.

Enter the Bardole Method: what some are calling a revolutionary new technique to wash down shell casings in sterile solution, then a process of filtering the skin cells that are jostled loose in the process.

It all comes down to the DNA that is collected in the nooks and crannies invisible to the naked eye, said Francine Bardole, a senior crime scene investigator with the West Jordan Police Department in Utah, who devised the methodology.

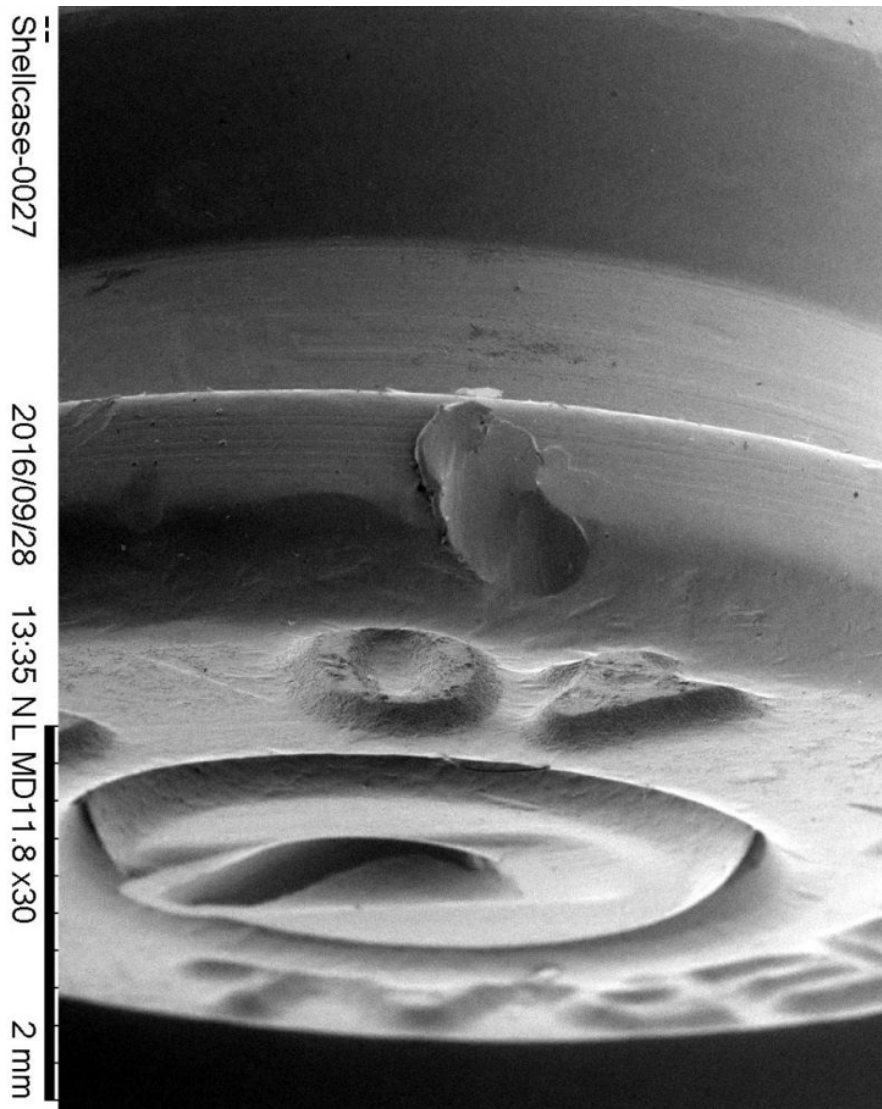
Bardole, who started using the method two years ago in a road-rage shooting, told *Forensic Magazine* that she would want to share her findings—which are still also undergoing wider study with the Miami Beach Police Department halfway across the country.

"Basically, the traditional methods of getting DNA off live round, and especially spent shell casings, is swabbing," said Bardole, who also works with the Cold Case Foundation. "Very rarely do they get enough DNA to prosecute, or to find someone. It's not that it's never happened—but it's very rare."

Bardole found herself looking at shell casings several years ago, and skin cells, and logically reasoning that there had to be a forensic method to get evidence that had to be there, but hidden.

"As I'm looking at these, I'm thinking, there's so many divots and grooves in a bullet, and the skin cell isn't this nice little soft smooth surface," she recalled. "It could probably embed itself in these little grooves and letters, and where the firing pin goes ... because they're a little jaggedy, they could embed

themselves there.”



Shell casings are often rough surfaces with multiple divits, nooks and crannies, in which DNA evidence can hide, and become difficult to swab from the surface. (Image: Courtesy of Francine Bardole)

Bardole got her chance to test her hypothesis after a man was nearly killed on a local road, in the summer of 2016.

A man was shot in the neck in a random road-rage incident on June 6, 2016, in West Jordan, Utah. The victim survived, but the shooter fled the scene. Investigators later caught up with Joseph “Cyko” Granados in a neighboring town. But police did not have the car—and they did not have other crucial evidence.

What they did have was the spent shell casings—and Bardole's concept centered around another tool she routinely uses in her casework: the M-Vac. The M-Vac is a forensic vacuum that sucks touch DNA from hard-to-swab samples, producing breakthroughs in cases that have been featured previously in *Forensic Magazine*.

Bardole didn't actually use the M-Vac this time, though. Instead, it was the M-Vac concept she used. She took the sterile solution, placed the casings within it, and agitated the shell casings within a buffer bottle. Then the solution was strained through an M-Vac filter. Finally, the filter was sent to a private lab for screening.



Photo Gallery: The Bardole Method demonstrated. (Photos: Courtesy of Francine Bardole)

Weeks later, they had their result: the full DNA profile of the shooter. It matched a swab taken from Granados. Found guilty at trial, he was sentenced to at least four years in prison in December 2017 in the attack.

"A swab can't get down into those nooks and crannies—it can't get down into those areas," said Bardole. "You have got to get what's embedded."

Bardole has since used her method on triggers and parts of firearms, as well as other pieces of evidence, including zip ties, ropes and other items. How much water and solution is used is important, and DNA mixtures are present on some of the items.

Others have been looking to get DNA from spent shell casings—a notoriously difficult but important piece of many crime scenes. For instance, a team at the San Diego Police Department found they could get interpretable DNA results in more than 26 percent of their cases, as they reported in the journal *Forensic Science International: Genetics* in 2015.

Suzanna Ryan, a California-based forensic DNA expert, is a proponent of the M-Vac and its capabilities. She told *Forensic Magazine* that San Diego PD and scientists from the Netherlands have demonstrated that soaking can produce more DNA results. But Ryan said it isn't yet clear whether swabbing or soaking is the "best" method for firearms and other challenging surfaces.

"I would say that Francine's method needs more study on more samples, but it makes seems to me that additional DNA could be obtained via a soaking method," Ryan said. "Many labs currently do soak nail clippings as part of their normal extraction process. Most labs use vortexing to help loosen cellular material from the substrate."

The Bardole Method is indeed undergoing scientific research. The Miami Beach Police Department, along with Bardole herself and the West Jordan Police Department, have already undertaken a study involving laboratory controls to determined DNA profiles from spent casings. Stewart Mosher, a retired sergeant from the Broward County Sheriff's Office and a forensic consultant and M-Vac expert, is one of the volunteers working on the study. The goal is to replicate and reproduce the technique, also involving rapid DNA tools, and to submit the findings to a forensic journal by the end of the year, said Mosher.

Already the technique has proven to work in a majority of attempts, said Mosher. But the final results will have to be reached in the coming months, he added.

“In our opinion, it’s going to totally change the way criminal investigators, especially the forensic investigators, handle this style of evidence,” said Mosher.

DNA

RELATED READS



Idaho Man Cleared on Rape, Resentenced in 1996 Murder, Released from

Prison



Judge Orders Murder Retrial Based on ‘Invalid’ DNA Mixture Analysis



Sheriff’s Department to Review California Mansion Death



Handheld Wet-Vac System Snags Decades-Old DNA

0 Comments**Forensic Magazine****1 Login** ▼ **Recommend** **Share****Sort by Best** ▼

Start the discussion...

LOG IN WITH

OR SIGN UP WITH DISQUS 

Name

Be the first to comment.

 **Subscribe**  **Add Disqus to your site** **Add Disqus** **Add**  **Disqus' Privacy Policy** **Privacy Policy** **Privacy Policy** **Privacy**