5-2016

A Validation Study of Zar-Pro Fluorescent Blood Lifting Strips

Carter L. DePew

The University of Southern Mississippi

A Validation Study of Zar-Pro Fluorescent Blood Lifting Strips

by

Carter L. DePew

A Thesis
Submitted to the Honors College of
The University of Southern Mississippi
in Partial Fulfillment
of the Requirements for the Degree of
Bachelor of Science
in the School of Criminal Justice

May 2016

Approved by

_____

Dean Bertram, Ph.D., Thesis Adviser
Instructor of Forensic Science

_____

Lisa Nored, Ph.D., Director
School of Criminal Justice

_____

Ellen Weinauer, Ph.D., Dean
Honors College

Abstract

It is well known within the latent fingerprint discipline that collection of bloody impressions can be difficult and destructive. This pilot study aims to validate the use of Zar-Pro Fluorescent Blood Lifting Strips© in the collection of bloody fingerprint impressions, and then compare the technique outcomes that of the currently used method – photography. This study used both collection methods to extract bloody impressions from white copy paper and aluminum metal. The impressions were aged over a two-week period prior to collection. A numerical score – representative of the identifiable minutiae points – was then obtained using the Smart Extract feature within the AFIX Tracker system for each impression. Statistical analyses determined that photographed impressions contained more discernible minutiae points; however, those same photographed impressions also had a great deal more background interference than the Zar-Pro lifted impressions. Thus, the study concludes that bloody impressions collected with Zar-Pro technology produces more accurate results than photography produces – despite the large difference in scores.

Keywords: Blood, Zar-Pro, Photography, AFIX Tracker, Validation, Identifiable Minutiae Points

Acknowledgments

I would like to thank Dr. Dean Bertram for assisting and guiding me through this process. His enthusiasm and expertise guided me with post-graduation career choices as well as academic endeavors.

I would also like to thank my mother, Donna DePew, for being my biggest supporter and confidant throughout life. As I now enter the professional world, I know she will continue to be my rock through all of the forthcoming highs and lows.

Table of Contents

List of Tables

List of Figures

Chapter I: Introduction

Fingerprints are a form of identification evidence left behind when the bare hand comes into contact with a surface. Impressions can be preserved on any type of surface, ranging from glass to paper and even human skin. A fingerprint can also be created with a number of matrices. For example, an impression created within a blood matrix, or blood impression, is often associated with violent crimes. Bloody fingerprint evidence left behind poses a challenge for evidence collectors and latent fingerprint examiners.

Traditionally, blood impressions are located on large and immovable surfaces, and a result can customarily be collected through photography only. Photography allows an impression to be enlarged for analysis purposes, but also hinders the ability to perform additional tests. It is common to use enhancement chemicals to increase the quality of a photograph, but it also unfortunately eliminates the likelihood of successfully lifting and transporting a print to the lab[1].

Zarate saw a need for a better technology to enhance the quality and success of fingerprint evidence, and as such created the Zar-Pro Fluorescent Blood-Lifting Strips© to counteract the difficulties of collecting blood impression evidence. Zar-Pro technology allows blood impressions to be collected from multiple surface types (such as varying textures, and bulky and immovable objects) that cannot be transferred to the lab for processing. Impressions lifted with these strips are permanent, and also free of the damaging effects that smearing causes to many forms of bloody evidence. These lifts also eliminate background noise (i.e., contaminating patterns or textures that hinder the visibility of friction skin ridges on the raised portions of skin on the palms of hands and

soles of feet) often present in photographs, while also permitting further enhancement through the use of an alternate light source (ALS)[2].

This product is a revolutionary innovation that sparked the notion that technology could substantially change the world of latent print examination. Zar-Pro technology has the potential to transform the field of Forensic Science by improving the evidence collection process, and through obtaining a better quality product which could lead to more identifications, arrests and convictions. Due to the newness of Zar-Pro lifters, there is an insufficient amount of information about its validity; this research aims to fill that void, as well as to investigate its potential use in the field.

This validation study will examine the outcomes for using Zar-Pro Fluorescent Blood-Lifting Strips© to collect bloody fingerprint impressions. Zar-Pro lifters will be compared with currently used, as well as more traditional, methods of collection to observe the quality of such impressions.

Chapter II: Literature Review

What is a Fingerprint?

A fingerprint is the unique pattern created when friction skin ridges – located on the pads of the tips of the fingers – come in contact with a surface. These ridges begin to appear around the tenth week of gestation, and become permanent about halfway through the second trimester[3]. Skin consists of three major layers: epidermis, dermis, and hypodermis. The epidermis is the outer protective barrier of the body. The dermis is the underlying support system for the epidermis, and also regulates body temperature. The hypodermis lies beneath the dermis, and serves as an energy host, which houses body fat to insulate the body[3]. Friction skin ridges are firmly anchored in the dermis, which provides lifelong support and permanence for the fingerprint[3].

A fingerprint's unique pattern is created from random alignment of friction skin ridges. The FBI Fingerprint Training Manual states there are three pattern types: loop (60% of population), whorl (35% of population), and arch (5% of population)[4]. In a loop pattern, friction skin ridges enter one side, recurve, and exit on the same side of entry. Loops are subdivided into two subcategories: ulnar and radial. An ulnar loop has ridges that flow in the direction of the little finger, while ridges of a radial loop flow in the direction of the thumb. A whorl pattern has ridges that flow in a circular pattern, and enter and exit on opposite sides. There are four subcategories for a whorl: plain, central pocket, double loop, and accidental. A plain whorl is the standard whorl with large, broad circles. A central pocket whorl has a small, tight circular flow. A double loop whorl contains two interlocking loop patterns. An accidental whorl is a random mixture of different pattern features. Lastly, an arch flows in one side and out the other with a peak

in the middle. A plain arch is the standard arch, but a tented arch contains either an up-thrusting ridge, an angle, or two of three loop characteristics[4]. Figure 1 illustrates these three patterns (as drawn by the California Statewide Fingerprint Imaging System).

(a) *(b)* *(c)*

Diagrams of the three different fingerprint patterns with (a) is an arch, (b) is a loop, and (c) is a whorl.
Figure 1

The most common reason for fingerprint formation is through sweat produced by eccrine glands, within the skin's dermal layer. These glands have pores on the surface of friction skin ridges. Although sweat is mostly water, it contains many other elements as well, including amino acids and enzymes, which are deposited when the pad of the finger touches a surface[3]. Although a fingerprint is generally formed from natural sweat and oils, it is not unusual for a print to be deposited through a wide range of matrices.

When an impression is detected *in situ* (or in its original location), it is classified as one of three categories: latent, patent, or plastic[5]. A latent print is invisible to the naked eye, but can be visually enhanced through powders or alternate light sources. A patent print is visible to the naked eye because it is created from a visible substance that has been transferred to the surface, such as when an individual with bloody hands touches a surface. Thirdly, a plastic print is formed when a finger is pressed into a soft, malleable

substance which preserves the impression's ridge detail,[5] such as when the finger is placed into a droplet of blood on the surface of an object.

Current Methods

Due to the sensitivity of blood impressions, a limited number of methods can be used for their collection. A small list of stains forms a pigmented complex when reacting with proteins present in blood. The impression, however, must be fixed upon a substrate, which can cause difficulty when lifting and transporting the impression[6]. Amido black, crystal violet and ninhydrin are commonly used to address these problems, but require the impression be sprayed with a staining solution. In some cases the impression must even be heated at high temperatures before the solution can be applied[6]. Amido black is the method of choice because it can be used on both porous and non-porous surfaces[7]. Both a fixing and working solution must be used to accurately stain the impression for analysis. The fixing solution, comprised of 5-sulphosalicylic acid, is responsible for fixing the impression on to the surface; while the working solution, which contains amido black and citric acid, will stain the impression a very dark blue for visualization purposes[7]. Once the stained impression has dried, it can then be photographed for further analysis[7].

The difficulty and potential destruction that accompanies staining reagents leads many forensic scientists to instead use photography to collect blood impressions. However, all impressions should be continuously photographed throughout the analysis to adequately document the evidence. The impressions can additionally be enhanced through an alternate light source (ALS) in order to improve the quality of the impression and photograph[8]. A scale also is included in the photograph as a reference for size.

Alternate Light Source (ALS)

Alternate light source (ALS) is a "high-powered lamp which produces a white light consisting of a wide range of wavelengths"[3]. A grating or filter system is used to divide white light into different colors, which then appear at differing wavelengths. ALS detects latent fingerprints at a crime scene due to certain components of the latent print, along with any contaminants present, fluorescing under a particular wavelength[3]. Filtered goggles aid in visualization of the impression, while also serving to protect the examiner's eyes. Fluorescent chemicals and powders can be applied before or after ALS use to enhance visibility of the latent print[3]. Figure 2 is an example of a one-month old blood impression lifted off an aluminum surface (by Zarate) when developing Zar-Pro lifters. The photographs illustrate how lifters differ under normal white light and an ALS.

(a) *(b)*

Photographs of a blood impression lifted using the Zar-Pro Fluorescent Blood Lifting Strips (a) under normal white light and (b) under an ALS light source.

Figure 2

Zar-Pro Fluorescent Blood-Lifting Strips

Zar-Pro Fluorescent Blood-Lifting Strips© were developed to resolve complexities with collecting blood impression evidence. Zar-Pro is a "revolutionary new fluorescent

lifting strip used for preserving bloody and proteinaceous impression evidence"[9]. The strips are successful due to a titanium dioxide component within the lifting substance. Titanium dioxide creates a bond with molecules often found in blood plasma[10]. The Zar-Pro lifting strips possess fluorogenic properties which allow an alternate light source (ALS) to be used without the assistance of external fluorescence enhancers. The blood reacts with properties within the lifting material to create an impression that can now be visually enhanced through an ALS[10].

Zar-Pro lifters are manufactured in large sheets that can be cut to match evidence. The lifter's nylon material must be activated with a 50:50 solution of water and methanol. The white background of the lifting strip provides a contrast to the blood impression in addition to a contrasting dark background when placed under an ALS[10]. The permanence of the lifters allows an impression to be stored up to two years without unintended damage from smearing or alterations.

AFIX Tracker

In 1998, a fingerprint system was created that was cheaper and more commonly used on PC computers[11]. This system, known as AFIX tracker, was derived from the Federal Bureau of Investigation's (FBI) Automated Fingerprint Identification System (AFIS). The Smart Extract feature within AFIX Tracker uses algorithms to identify and locate individual minutiae points (small details along the ridge path) within the fingerprint[3] Bifurcations and ridge endings are the most commonly extracted minutiae because all other such points are formed by varying combinations of the aforementioned points[3]. A bifurcation arises when a single friction skin ridge splits and diverges into two separate ridges. As the name implies, a ridge ending is a friction skin ridge that

terminates within the ridge path[12]. This Smart Extract feature will be used to electronically locate an impression's minutiae, and then offer a score that represents the number of those identifiable minutiae points.

Chapter III: Methodology

Materials

This study will use two methods of lifting blood impressions: Zar-Pro Fluorescent Blood Lifting Strips© and the current method – photography. One method will use 8 in. x 8 in. Zar-Pro Fluorescent Blood Lifting Strips© along with the accompanying activator solution. A second (and current) method will use a Nikon D90 camera in conjunction with a photography stand with adjustable lighting and height options.

Two substrates will be used: porous surface (white copy paper) and nonporous (aluminum metal). The impressions will be created from an inkpad saturated with a 100 mL stock of citrated bovine blood, meaning it has been treated with citric acid and sodium acetate to prevent coagulation during storage[13]. Nitrile gloves must be worn during the lifting process because latex gloves have proteinaceous properties that can be transferred to Zar-Pro lifters. Lastly, a Nikon D90 camera will be used to photograph the impressions throughout the process.

Methods

For the Zar-Pro technique, a bare finger will be rolled across a blood-soaked inkpad to create a thin layer of blood on the surface of the skin. Several sequential impressions will be made by the blood-covered finger on a sheet of white copy paper in order to observe the decrease in blood concentration. All impressions will be collected to observe the variance in the decreasing blood concentration. While wearing nitrile gloves, the Zar-Pro lifter will be cut to a size that fits the impression, and activated with the activator solution. The impression will then be lifted from the paper substrate and properly preserved for storage and further analysis.

For the photography technique, impressions will be created using the same method outlined in the preceding paragraph (i.e., copy paper). An overview photograph of the impressions will first be produced to illustrate location of the impressions. Then, two close-up photographs of each impression (one with and one without its label) will be taken to enhance visibility of ridge detail. The photograph will be analyzed for identifiable minutiae points similar to the lifted impressions.

Examination of the aluminum substrate will follow the same procedure described in the preceding paragraph for both the Zar-Pro lifters and photography method. Twenty-five impressions will be created on each of the two substrates and using each of the two methods – totaling 100 impressions. Fifteen impressions on each substrate for each method will be immediately be collected (total of 60 impressions), while 10 impressions from each substrate and method will be aged for two weeks (total of 40 impressions). Aging the impressions will permit observation of decreases in ridge detail over the duration of time. The aged impressions will be then lifted and/or photographed with the same technique as used for the fresh impressions. All impressions will be photographed at various stages of the process to document results.

Analysis

The Smart Extract feature (within the AFIX Tracker system) will electronically identify individual minutiae in each impression and convert them into a numerical score for all lifted and photographed impressions. The mean of those scores will then be calculated for both Zar-Pro lifters and photographs. The method with the highest scores will be recognized as the best method. However, results will not allow for determination of which product is generally best for wide application.

All blood impressions will be created on the same day. The entire collection process will take approximately three weeks, namely because of the two-week aging process required before collecting impressions. Analysis of lifted and photographed impressions in the AFIX Tracker system will take a maximum of one week. This allotted time also accounts for scheduling and laboratory availability. Once all scores are obtained, numerical analysis to yield the results should take no more than one day. The entire process, from creation and collection of impressions to analysis of data, will take in the neighborhood of six weeks. Data collection will begin in late January or early February, and should be complete early in March. Interpretation of results will follow.

Chapter IV: Results

One hundred blood impressions were collected from two different substrates, using two different collection methods. The impressions were scanned into the AFIX Tracker system, and a score was obtained using the Smart Extract feature to yield the number of identifiable minutiae points located within the impression. The scores were input into an Excel spreadsheet, and the mean score was obtained for each substrate and each collection method. Tables 1 and 2 reflect the average score of the impressions collected using Zar-Pro lifters, while Tables 3 and 4 reflect the average score of the impressions collected through photographic methods.

Table 1: Average Score of Impressions Lifted from Paper Using the Zar-Pro Fluorescent Blood Lifting Strips

Paper	Mean
Touch 1	20.6
Touch 2	7
Touch 3	0.4
Touch 4	0.4
Touch 5	0

Table 2: Average Score of Impressions Lifted from Aluminum Using the Zar-Pro Fluorescent Blood Lifting Strips

Aluminum	Mean
Touch 1	24.4
Touch 2	25.6
Touch 3	26.6
Touch 4	14.8
Touch 5	13.6

Table 3: Average Score of Impressions Collected from Paper Using Photography

Paper	Mean
Touch 1	31.4
Touch 2	22.6
Touch 3	40
Touch 4	26
Touch 5	8.6

Table 4: Average Score of Impressions Collected from Aluminum Using Photography

Aluminum	Mean
Touch 1	42.4
Touch 2	44
Touch 3	60.4
Touch 4	43.8
Touch 5	35.4

The four tables are color-coded in order to illustrate the steady decrease in blood concentration with each sequential touch. As the tables collectively represent, the scores for photographed impressions were always higher at each corresponding touch when compared to the impressions lifted with Zar-Pro technology. Regardless of blood concentration, however, the Smart Extract feature found more discernable minutiae in photographed impressions when compared to those lifted with Zar-Pro Fluorescent Blood Lifting Strips©.

What is not reflected in the numerical data, however, is the large background interference present with photographed impressions. Regardless of the substrate (copy paper or aluminum), the Smart Extract feature highlighted many background features as minutiae points that were not a component of the impression's ridge detail. This interference was not present with any impressions collected with Zar-Pro lifters. Therefore, it is clear that lifted impressions yield a higher level of accuracy. The score

obtained from impressions collected with Zar-Pro lifters was solely obtained from ridge details, whereas the score obtained from photographed impressions included both ridge detail and background characteristics. Considering this error, Zar-Pro Fluorescent Blood Lifting Strips© produced better and more accurate results than did photography.

An additional observation indicated that impressions collected from a porous surface (copy paper) produced much lower scores than those extracted from a nonporous surface (aluminum). Given that copy paper absorbed more blood with each touch than did aluminum, this finding was not surprising. Essentially, the absorbance factor caused a greater loss of blood concentration between touches, and as a result there was less ridge detail for each successive touch on the copy paper when compared with the aluminum surface. This lack of discernable ridge detail contributed to lower scores regardless of the collection method. In light of this phenomenon, Zar-Pro lifters were much more effective on non-porous surfaces with a lower blood concentration and porous surfaces with a higher blood concentration.

Chapter V: Conclusion

The findings of this study illustrate a significant difference between impressions collected with Zar-Pro Fluorescent Blood Lifting Strips© and photographic methods. Because this was a pilot study, there were no previous studies with which to compare the results. Despite the lack of comparative research, this study did show that every case involving photographed impressions produced more identifiable minutiae points. An influx of background interference did impact, however, the higher scores observed.

Certain limitations surfaced during the course of the study that may account for the results. The first limitation pertains to the relatively small sample of 100 impressions (25 for each substrate and collection method). A second limitation is that only the right thumb was used to create the bloody impressions. As such, here was no variation in surface area or ridge detail. It would be beneficial to replicate the study using a larger sample size and more diversified impression pool.

Given that this research was a pilot study in latent fingerprint examination, future research should strive to discover more details about the successes and limitations of the Zar-Pro Fluorescent Blood Lifting Strips©. Some suggestions include comparing the Zar-Pro lifter results to other methods which either stain impressions with Amido Black, age impressions longer than two weeks, or re-scan impressions lifted with Zar-Pro after a specified passage of time to observe if any degradation of ridge detail occurred. This list of potential research is not exhaustive since Zar-Pro Fluorescent Blood Lifting Strips© is a relatively new technology. As more research is performed using Zar-Pro lifters, more avenues may open that would produce additional information about their use (including new developments) in the Forensic Science community.

Literature Cited

1. Morris, Mill. "Casting a Wide Net: Lifting Fingerprints from Difficult Surfaces." Forensic Magazine. Forensic Magazine, 8 Jan. 2005. (Accessed January 25, 2015).
2. "Zar-Pro Fluorescent Blood Lifting Strips." TriTech Forensics. TriTech Forensics, n.d. (Accessed January 25, 2015).
3. Holder, Eric H., Laurie O. Robinson, and John H. Laub. "Anatomy and Physiology of Adult Friction Ridge Skin." The Fingerprint Sourcebook. Washington D.C.: U.S. Department of Justice, n.d.. Print.
4. FBI Fingerprint Training Manual. N.p.: U.S. Department of Justice, 1987. No Records. (Accessed February 21, 2015).
5. Byrd, Mike. "Free Newsletter." Ridge Detail at a Crime Scene. Crime Scene Investigator Network, n.d. (Accessed February 21, 2015).
6. Lee, Henry C., and R. E. Gaensslen. "Methods of Latent Fingerprint Development." Advances in Fingerprint Technology. 2nd ed. Boca Raton, FL: CRC, 2001. 105-77. Print.
7. Penven, Don. "Latent Blood Prints Methods For Chemical Enhancement." No Records. Crime Scene Investigator Network, 22 Jan. 2013. (Accessed March 31, 2015).
8. "A Simplified Guide to Fingerprint Analysis: How It's Done." Forensic Science Simplified. National Forensic Science Technology Center, n.d. (Accessed February 21, 2015).

9. "What Is Zar-Pro?" Zar-Pro Fluorescent Blood Lifting Strips. Zar-Pro, n.d. (Accessed February 24, 2015).
10. Zarate, Jessica, and Charles Morden. "A Fluorogenic Method for Lifting, Enhancing, and Preserving Bloody Impression Evidence." Journal of Forensic Identification 61.3 (2011): 260-80. International Association for Identification. (Accessed January 25, 2015).
11. AFIX Technologies Inc. AFIX Technologies Inc., 2012. (Accessed February 26, 2015).
12. Triplett, Michele. "Michele Triplett's Fingerprint Terms." Michele Triplett's Fingerprint Information. N.p., 7 Feb. 2015. (Accessed February 26, 2015).
13. "Citrated Blood." Def. 2. The Free Dictionary- Medical Dictionary. N.p., n.d. (Accessed March 24, 2015).

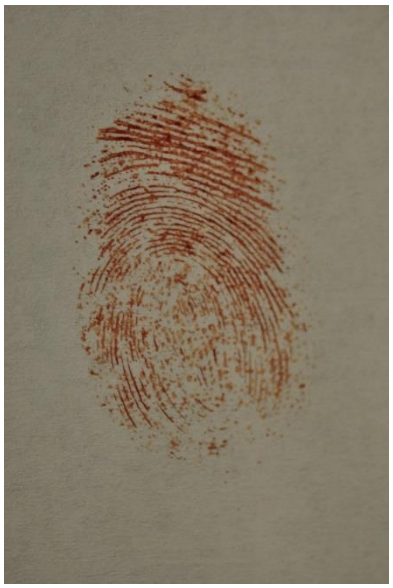
Appendices

Appendix A: Complete Tables of Individual Impression Scores

Zar-Pro Fluorescent Blood Lifting Strips			
Paper		Aluminum	
Impression	AFIX Score	Impression	AFIX Score
ZP-1a	8	ZP-1b	18
ZP-2a	1	ZP-2b	16
ZP-3a	0	ZP-3b	13
ZP-4a	0	ZP-4b	0
ZP-5a	0	ZP-5b	2
ZP-6a	21	ZP-6b	51
ZP-7a	1	ZP-7b	36
ZP-8a	0	ZP-8b	24
ZP-9a	1	ZP-9b	13
ZP-10a	0	ZP-10b	0
ZP-11a	7	ZP-11b	50
ZP-12a	6	ZP-12b	48
ZP-13a	0	ZP-13b	26
ZP-14a	0	ZP-14b	10
ZP-15a	0	ZP-15b	1
Aged Impressions			
ZP-16a	47	ZP-16b	2
ZP-17a	5	ZP-17b	10
ZP-18a	1	ZP-18b	43
ZP-19a	0	ZP-19b	29
ZP-20a	0	ZP-20b	25
ZP-21a	20	ZP-21b	1
ZP-22a	22	ZP-22b	18
ZP-23a	1	ZP-23b	27
ZP-24a	1	ZP-24b	22
ZP-25a	0	ZP-25b	40

Photography			
Paper		Aluminum	
Impression	AFIX Score	Impression	AFIX Score
C-1a	13	C-1b	51
C-2a	39	C-2b	25
C-3a	1	C-3b	91
C-4a	80	C-4b	71
C-5a	3	C-5b	11
C-6a	34	C-6b	18
C-7a	10	C-7b	80
C-8a	185	C-8b	128
C-9a	42	C-9b	61
C-10a	24	C-10b	49
C-11a	46	C-11b	16
C-12a	21	C-12b	16
C-13a	13	C-13b	0
C-14a	4	C-14b	6
C-15a	6	C-15b	21
Aged Impressions			
C-16a	29	C-16b	38
C-17a	2	C-17b	78
C-18a	0	C-18b	35
C-19a	2	C-19b	65
C-20a	9	C-20b	34
C-21a	35	C-21b	89
C-22a	41	C-22b	21
C-23a	1	C-23b	48
C-24a	2	C-24b	16
C-25a	1	C-25b	62

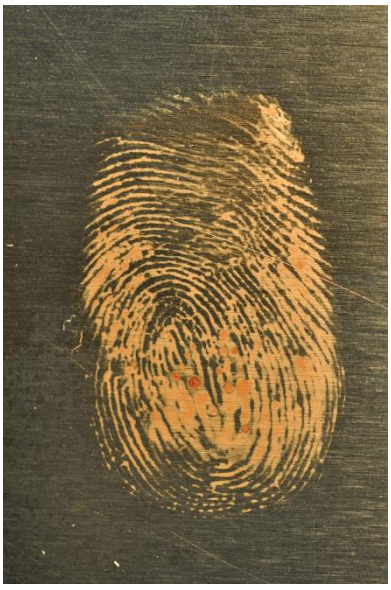
Appendix B: Sample Pictures of Impressions Collected



Impression C-1a (First touch on paper; photographed)

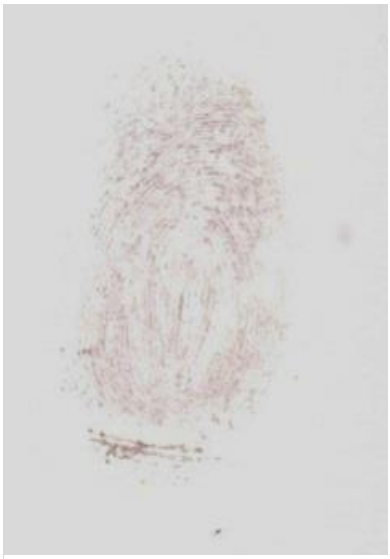
Impression C-14b (Fourth touch on Aluminum; photographed)

Impression C-17a (Second touch on paper; photographed; aged 2 weeks)



Impression C-23b (Third touch on Aluminum; photographed; aged 2 weeks)

Impression ZP-1a (First touch on paper; lifted with Zar-Pro)



Impression ZP-12a (Second touch on paper; lifted with Zar-Pro)

Impression ZP-6b (First touch on Aluminum; lifted with Zar-Pro)

Impression ZP-13b (Third touch on Aluminum; lifted with Zar-Pro)

Impression ZP-18a (Third touch on paper; lifted with Zar-Pro; aged 2 weeks)

Impression ZP-21b (First touch on Aluminum; lifted with Zar-Pro; aged 2 weeks)

Appendix C: IRB Approval Letter

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 15060904
PROJECT TITLE: A Validation Study of Zar-Par Fluorescent Blood Lifting Strips
PROJECT TYPE: New Project
RESEARCHER(S): Carter DePew
COLLEGE/DIVISION: College of Science and Technology
DEPARTMENT: Criminal Justice
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Exempt Review Approval
PERIOD OF APPROVAL: 08/06/2015 to 08/05/2016
Lawrence A. Hosman, Ph.D.
Institutional Review Board