

## Accepted Manuscript

Title: A forensic investigation on the persistence of organic gunshot residues

Authors: Matthieu Maitre, Mark Horder, K.Paul Kirkbride, Anne-Laure Gassner, Céline Weyermann, Claude Roux, Alison Beavis



PII: S0379-0738(18)30669-8  
DOI: <https://doi.org/10.1016/j.forsciint.2018.08.036>  
Reference: FSI 9460

To appear in: *FSI*

Received date: 22-6-2018  
Accepted date: 25-8-2018

Please cite this article as: Matthieu Maitre, Mark Horder, K.Paul Kirkbride, Anne-Laure Gassner, Céline Weyermann, Claude Roux, Alison Beavis, A forensic investigation on the persistence of organic gunshot residues, Forensic Science International <https://doi.org/10.1016/j.forsciint.2018.08.036>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## A forensic investigation on the persistence of organic gunshot residues

Matthieu Maitre<sup>1</sup>, Mark Horder<sup>2</sup>, K. Paul Kirkbride<sup>3</sup>, Anne-Laure Gassner<sup>4</sup>, Céline Weyermann<sup>4</sup>, Claude Roux<sup>1</sup>, Alison Beavis<sup>1</sup>

1. Centre for Forensic Science, University of Technology Sydney, PO Box 123, Broadway, NSW 2007, Australia

2. Forensic Ballistics Investigation Section, Forensic Services Group, NSW Police Force, Goulburn St, Surry Hills, NSW 2010, Australia

3. School of Chemical and Physical Sciences, Flinders University, GPO Box 2100, Adelaide, SA 5001, Australia

4. School of Criminal Justice, University of Lausanne, Batochime, 1015 Lausanne, Switzerland

### Abstract

Gunshot residues (GSR) are a potential form of forensic traces in firearm-related events. In most forensic laboratories, GSR analyses focus on the detection and characterisation of the inorganic components (IGSR), which are mainly particles containing mixtures of lead, barium and antimony originating from the primer. The increasing prevalence of heavy metal-free ammunition challenges the current protocols used for IGSR analysis. To provide complementary information to IGSR particles, the current study concentrated on the organic components (OGSR) arising from the combustion of the propellant. The study focused on four compounds well-known as being part of OGSR: ethylcentralite (EC), methylcentralite (MC), diphenylamine (DPA), *N*-nitrosodiphenylamine (*N*-nDPA). This study assessed the retention of these OGSR traces on a shooter's hands. The overall project aim was to provide appropriate information regarding OGSR persistence, which can be suitable to be integrated into the interpretation framework of OGSR as recommended by the recent ENFSI Guideline for Evaluative Reporting in Forensic Science. The persistence was studied through several intervals ranging from immediately after discharge to four hours and two ammunition calibres were chosen: .40 S&W calibre, used by the NSW Police Force; and .357 Magnum, which is frequently encountered in Australian casework. This study successfully detected the compounds of interest up to four hours after discharge. The trends displayed a large decrease in the amount detected during the first hour. A large variability was also observed due to numerous factors involved in the production, deposition and collection of OGSR.

Download English Version:

<https://daneshyari.com/en/article/11024519>

Download Persian Version:

<https://daneshyari.com/article/11024519>

[Daneshyari.com](https://daneshyari.com)