B139 Fingermark Recovery Methods From Submerged Knives in Different Aquatic Environments

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Learning Overview: The goal of this presentation is to demonstrate methods to recover fingermarks from different types of wet knives and how the aquatic environments affect the fingermarks.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by: (1) showing how to get fingermark recovery from wet items, (2) increasing awareness and understanding of how the texture and environment influence the chosen method, and (3) highlighting the importance of comprehensive research to give investigators and practitioners confidence in the method they have selected to process each wet item.

There are many challenges when visualizing and recovering fingermarks of evidential value from submerged items. This is due to many variables, including the effect of water.[1] Some believe bodies of water to be a destructive environment, however research has shown that fingermarks can survive.[2-4] Moreover, it is the method used that can affect the quality of the recovered fingermark. There is little research looking at the survivability of fingermarks in aquatic environments and fewer still researching the effect of the environments on the marks.[5]

With the increase in knife crime in the United Kingdom (UK), it is imperative that the best method for each crime scene is investigated and thoroughly researched. In England and Wales, from April 2016 to March 2017, there were 34,700 reported offenses involving a knife or sharp object. This is the highest reported number of incidents since 2011 and a 20% increase on 2016, showing a big increase in knife crime, making this a prominent issue for Police Forces.[6] Bodies of water are common in the UK, with a mix of rivers, ponds, lakes, estuaries, and the sea, making them an ideal place to dispose of a weapon. It is important to understand the environment the substrate was found in and how this can affect not only the fingermark but the substrate itself.

This study focuses on identifying methodologies that have not been fully considered and tested for recovering fingermarks from knives submerged in different aquatic environments. It examined the effect of different bodies of water, sea, river and harbor, and the texture of the substrate on the development and visualization of the mark. The aim was to help improve the effectiveness of forensic methods for underwater investigations, and to provide a guide for police and forensic practitioners on the evidence potential of items found in water. However, this work is on-going in these preliminary studies; a variety of fingermark development methods were used, and different sequential processes were evaluated to optimize the approach for each water type and each knife.

In this study, the clearest marks were developed using cyanoacrylate fuming from the sea water. However, previous research had shown "salt water" to be more destructive and the UK Home Office manual does not recommend cyanoacrylate fuming for wet items.[7,8] This result highlights the need for further research into what is affecting the efficiency of cyanoacrylate fuming.[9] Each water type produced varying results that brings into question the influence the environment has. This study shows that water does not remove fingermarks and there is a need to identify the best method for each environment and substrate. These results have significant impact on forensic practice and increase awareness for investigating underwater crime scenes in the future.

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