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Development of Submerged Lotioned-Latent Fingerprints Using Enhancement Powder on Non-Porous Surfaces

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Structured Abstract

Background: This research delves into a comprehensive examination of the effectiveness of greasy and non-greasy lotions in the development of latent fingerprints, specifically when subjected to submerged conditions. The empirical investigation is grounded in a visibility score-based methodology, categorizing fingerprints into distinct developmental levels based on the clarity and quality of ridge details and other pertinent features. The primary objective is to discern the impact of water submersion on the visibility of fingerprints treated with different types of lotions.

Methods: 10 donors were involved in this project. They were treated with greasy and non-greasy lotions before disposition on the knife surface. All deposits were submerged into a container filled with tap water up until 120 hours. Using time interval of 24 hours, 48 hours, 72 hours and 120 hours, all deposits were taken out and dried at room temperatures for 45 minutes before powder enhancement took place. All enhancements were then graded using gradient quality table and compared.

Results: The study established five categories for greasy lotioned fingerprints, ranging from weak to very strong development. Lower visibility scores and weaker development categories indicated heightened vulnerability to water exposure, potentially compromising the clarity of ridge details and other features. In contrast, non-greasy lotioned fingerprints displayed predominantly strong and very strong development categories, showcasing their effectiveness in enhancing fingerprint visibility. This suggests that, under submerged conditions, non-greasy lotions contributed positively to the retention of clear and distinct features, minimizing the challenges posed by water exposure. However, the study also revealed that submersion in water can still present certain challenges for non-greasy lotion-treated prints, necessitating further research to optimize conditions for their use.

Conclusion: The study concluded that emphasise the need for careful consideration of lotion types and the impact of water submersion on forensic investigations involving submerged fingerprints. The recommendations include further research to optimize lotion formulations, comprehensive training for forensic analysts to enhance their awareness of water submersion impacts, rigorous testing and validation of non-greasy lotions, integration of advanced imaging technologies, and collaboration between forensic researchers, law enforcement agencies, and relevant industries.

Keywords: Latent Fingerprint, Greasy Lotion, Non-Greasy Lotion, Non-Porous Surface

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