Junior Science Communications
Faculty of Applied Sciences, UiTM Shah Alam
https://journal.uitm.edu.my/ojs/index.php/JSC

E-ISSN 2637-0689
Vol 42 2024

Colloquium on Applied Sciences 2024
19-21 January 2024, Faculty of Applied Sciences, UiTM Shah Alam, Malaysia

The Effect of Cooking Oil on the Quality of Latent Fingerprints Submerged in Tap Water

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Structured Abstract

Background: This study delves into the complexities of fingerprint analysis, specifically focusing on latent fingerprints submerged in tap water and the impact of viscous and non-viscous oils on fingerprint quality. Recognizing the pivotal role of fingerprint identification in criminal investigations, the research aims to understand the influencing factors crucial for enhancing forensic processes. The study contributes valuable insights to enhance the efficiency of fingerprint identification systems, particularly in scenarios where latent fingerprints may be inadvertently left at crime scenes. It sheds light on the impact of water submersion and investigates the distinctive effects of viscous and non-viscous oils on fingerprint quality, addressing challenges in fingerprint capture, enhancement, and identification.

Methods: Using Seri Murni Pure Vegetable Oil and Corn oil, along with tap water, the study creates controlled conditions at the UiTM Shah Alam forensic laboratory for depositing latent fingerprints on metal knife surfaces. Subsequently, fingerprints undergo a five-day submersion in tap water, and a dusting technique is employed for fingerprint development. Examinations are conducted using a fingerprint gradient quality scale to discern variations in visibility and quality, considering oil type and submersion duration.

Results: The results indicated that latent fingerprints coated with non-viscous oil consistently demonstrated superior visibility and quality compared to those coated with non-viscous oil throughout the five-day assessment period. The plotted graph showed a steep deterioration of quality in fingerprint coated with viscous oil after just 4 days ($y=0.5371x + 6.18$) while the non-viscous oil coated fingerprint still maintaining the quality up to 5 days of submersion ($y= 0.066x + 5.11$)). These emphasized the factors such as oil density, penetration, and chemical interactions with developing agents.

Conclusion: The findings suggest potential applications in forensic science, underscoring the importance of selecting appropriate oils and considering submersion times for optimal recovery of latent fingerprints. Future research recommendations include exploring different metal surfaces and enhancement techniques to further refine forensic practices in latent fingerprint analysis.

Keywords: Laten Fingerprint, Viscous oil, Non-Viscous oil, Gradient Quality

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