

Development of Older Latent Fingerprints by Super Glue Technique: A Case Study



Forensic Science

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ABSTRACT

Finger prints are recovered as a main physical evidence in majority of crime scenes. Latent finger prints are the most common type of finger print which is left unnoticed by the culprit. A large number of methods are being practised for the development of latent finger print among which cyanoacrylate fuming technique is widely used for development of latent finger prints on non-porous surfaces. In the present study we have applied the technique for development of latent finger prints which were six months older. Cyanoacrylate gives good visibility to latent finger prints on all four different articles. Thus we conclude that cyanoacrylate fuming technique is the most suitable technique for the development of older finger prints found on the crime scene.

Introduction:

In majority of civil and criminal cases fingerprints are recovered as a main physical evidence which is left unnoticed by the culprit [1]. The most common type of fingerprint found on any crime scene is latent fingerprints which are not visible to naked eyes [2]. Thus, its development is also highly important for comparison purpose [3].

There are huge numbers of methods which are being practiced for this purpose. For development of latent fingerprints the adoption of method solely depends on the type of surface, efficiency and simplicity [1]. Powder dusting method is the most common method for the development of latent fingerprints [4]. But on difficult surfaces this method fails to give satisfactory outcomes. Also in cases where finger prints are encountered after long time of its deposition. In such circumstances development of older finger print become a difficult task as the composition of latent finger print residue changes over time [5].

In such cases superglue or cyanoacrylate fuming technique is the best replacement of powder dusting method as it is the most common forensic analytical tool for development of latent fingerprints [6]. Super glue technique was discovered in 1950s [7]. This technique is very simple and easy to handle. As it is working on the basic principle of heating the cyanoacrylate under controlled humid atmosphere which produces the fuming and adhere on the fingerprints and enhance it which are easily visible to naked eyes [8]. Sweat present in latent print become dry within a short period of time but amino acids present in the print remains present for months. Superglue has a wonderful affinity to bind with amino acids. So when superglue adhere on the fingerprint it reacts with the amino acids and produce a cluster like structure and leave a sticky image of the prints. In cyanoacrylate fuming technique the super glue reacts with the amino acids, fatty acids and proteins present in the latent fingerprint and the moisture in the surrounding air to produce a visible sticky white element that forms along the pattern of the ridges of the fingerprints [9]. Also latent fingerprint developed by this technique becomes semi-permanent in nature which can be further treated with several dyes for making it more prominent [10].

Here we have discussed two case studies which were brought to ASFI (AhirSquare Forensic Investigator LLP) for investigation. Both cases were of theft, And few articles were encountered which bear the latent fingerprint of the said culprit. Thus in the investigation of both cases we proposed the cyanoacrylate fuming method for the development of latent fingerprints. Detailed history of both cases are discussed below.

Case History:

In last two years ASFI has encountered many private crime scenes bearing the latent fingerprints. During the investigation we have encountered a problem of developing latent fingerprints which were old. After six month of commencement of crime expert from ASFI was called to visit and investigate the scene of crime and few articles which were suspected to bear the fingerprints of the said culprits. As most of the articles were nonporous in nature we first preferred to use the powder dusting method but the results were not satisfactory. So we applied the cyanoacrylate fuming method for the development of old latent prints.

Articles found at the scene of crime were metal case, leather wallet, plastic file and stainless steel glass. All four articles were first examined by using the magnifying glass and UV light but as the prints were six month older they were not clearly visible. We also applied powder dusting method on the articles but the results were not so efficient so we applied cyanoacrylate fuming technique.

For this purpose a portable plastic fuming chamber was used. Cyanoacrylate was purchased from local market. To produce fumes article were put in the chamber and a small hot plate was placed in the box. 1 ml of cyanoacrylate was poured in a small aluminium cup and the cup was placed on the hot plate. Within few seconds fumes were produce which reacts with the fingerprints present on the article. For safety purpose the whole procedure was carried out in an open place as cyanoacrylate may be potent to human kind.

On application of fuming technique the latent fingerprint become visible and photographs were recorded for comparison purpose.

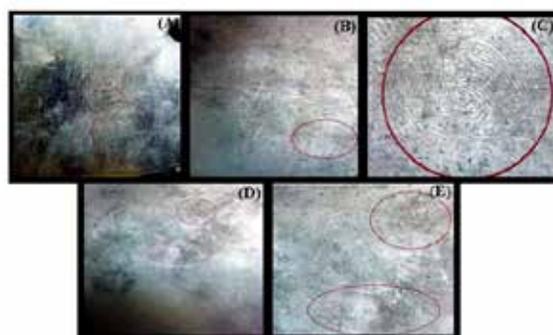


Figure 1 (A), (B), (C), (D) and (E) shows the photographs of latent fingerprint developed on the metal case by cyanoacrylate fuming technique.



Figure 2 (A), (B), (C) & (D) shows the photographs of latent fingerprints developed on stainless steel bowl by cyanoacrylate fuming technique

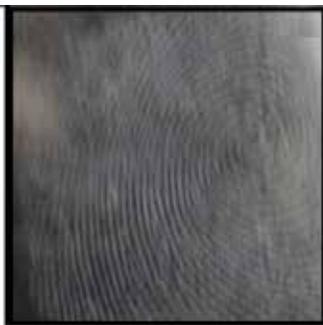


Figure 3 shows the photograph of latent fingerprint developed on leather wallet by cyanoacrylate fuming technique



Figure 4 (A), (B) & (C) shows the photographs of latent fingerprints developed on plastic sheet by cyanoacrylate fuming technique

Fig. 1 (A), (B) and (D) shows the photographs of latent fingerprint developed on metal case, while Fig. 1 (C) and (E) shows the enlarged photographs of Fig. 1 (B) and (D) respectively. Fig. 2 (A), (B), (C) and (D) shows the photograph of latent fingerprint on stainless steel bowl by cyanoacrylate fuming technique. Fig. 3 shows the photograph of latent fingerprint developed on leather wallet. Fig. 4 (A), (B) and (C) shows the latent finger print developed on plastic folder.

Conclusion

From the above study and observation we conclude that cyanoacrylate fuming technique is the one of the most suitable technique for the development of older latent fingerprints. Finger prints on non-porous surfaces can be easily developed by this technique. Also this technique is simple, rapid, easy and cost effective, which made this technique most effective for private investigation practices. The technique is the most preferable technique for development of

older latent prints as in the present study six months older prints were also developed by the same method.

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