

Appraisal of Non Conventional Household Powder for Development of Latent Fingerprint

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Abstract

Background: In recent time, there are many different methods which are used in developing of the latent fingerprints. From all the methods which are used, powder and ninhydrin are one of the most preferred methods in the field of the forensic science because of their simplicity and effectiveness. They are more efficient in the dry, relatively smooth and non-adhesive surfaces. This paper elucidation the application of non-conventional powder for developing and visualization of latent fingerprints. In this, 5 different type of substrate is chosen. The study makes evaluation on the cheap and easily available powders which are effortlessly available in every Indian household.

Result: The results obtained from this research are about 80% clear ridge details were seen on the different substrate like rice flour, potato powder, gram flour, Rasna and onion powder but only about 50% – 60% ridge details were seen in the case of the coffee, mint powder and tomato powder.

Conclusion: Present study is an attempt to decipher the latent fingerprints with the help of non conventional methods. From the above used powder; rice flour, potato powder, Rasna and onion powder showed the better ridge details as compared to the other non conventional powder used.

Keywords: Latent fingerprints; Non-conventional Method; Tomato powder; Potato powder; Substrate.

Introduction

Background

The fingerprint is one of the most important and valuable evidence which is generally find at the place of the scene of crime. It is so important due to their permanency, universality, uniqueness and availability.¹ Fingerprint is an impression of ridge outline which appears on the anterior surface of finger of the proximal, middle and the distal phalanges and on same on the thumb.² Each skin ridge is percolated with single row of pores that are open for the ducts leading sebaceous and oil gland. Through these pores, perspiration is discharge and deposited on the surface of skin. Once the finger

touches any surface, perspiration along with oil and other organic matter transferred onto that surface and hence impression is formed.³ Fingerprints can be categorized into 3, on the basis of visibility are patent, latent and plastic. Fingerprints are not new; it has been subjected for last 100 years. The first fingerprints were introduced in the China about 200 B.C.⁴ and after that there are many fingerprint research which gained a new speed. For development of the fingerprints there are a lot of developing and visualization method which was depend on the substrate. Substrate may be classified in 3, on the basis of their ability to absorb water soluble deposition is porous, non porous, and semi porous.⁷ Mainly for development of latent fingerprints (which are not visible with naked eyes),

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techniques like physical method, Iodine fuming method, Ninhydrin, Silver nitrate, DFO etc. were be used but from them many are toxic and poisonous to the human health. In order to overcome, there are some non-conventional methods which are quite helpful in development of the fingerprints.^{5,6,8} Non conventional methods are not always gave the effective result but quite effective for most of the surfaces. In the present study, some household powders like Potato Powder, Tomato Powder, Rice Flour, Mint Powder, Onion Powder, Gram Flour and Bourn-vita were used for development of fingerprints. The present study was an attempt to development of fingerprints where the conventional powders are not available. These are generally available household powders which was easily available in every household. These 8 available powders were used in development of fingerprints from 5 different substrates. These substrates are Steel, Bronze, Plastic, Glass, and Compact Disk. (Table 3)

Material and Methodology

The aim of this study is to decipher the fingerprints with the help of non conventional powder on different substrates. The latent fingerprints on different surfaces were collected on the request. As know, in the non conventional method powder was used and these powders adhere to the fatty acids and the oils which were present in the fingerprints. They are mainly used in the dry, relatively smooth and non adhesive surfaces. The study was carried out in the month of April to May when the temperature was about 35° to 40° C. In this month the perspiration level is also moderate due to presence of humidity in the environment. The total number of samples which was taken is 400. All the non conventional powder which are selected for performing this experiment are firstly grind properly and stored in the beaker in prevention of moisture. The brushing method was used. The following method was used in development of fingerprints:

Gently apply the powder to the surface by sweeping the brush in back and forth motion. Allow the brush to slightly touch the top of the surface. Care and ease are necessary during this pressure to assure that the very little pressure will apply because too much pressure will destroy the evidential value of the fingerprints, by destroying the ridges of the fingerprint and this also assure that the latent prints will not be over developed. After developing the latent fingerprints remove the

excess powder from the surface by blowing. Then the evidence is photographed for the purpose of the orientation and as a security. After that lift the fingerprints with the help of cellotape and paste it on the background according to the powder use and preserve it for further analysis.

The use of non- conventional household powder used in this study with their description is described under Table 1.

Table 1: Household powder with description.

S. No.	Powder name	Description
1.	Potato Powder	Highly concentrated and nutritious flour, obtained from pulp of cooked potato and mainly used in thickening of the soups.
2.	Tomato Powder	Powder made from the dried tomatoes after grinding them, used in adding the tomato flavour to the various dishes.
3.	Rice Flour	Form of flour made from finely milled rice, gluten free, high in protein and vitamins.
4.	Mint Powder	Powder made from the dried mint, gives aromatic smell and flavour to the various dishes.
5.	Onion Powder	Powder generally used in seasoning, varieties are present, in this red onion was used for making the powder.
6.	Gram Flour	Made up from Bengal gram.
7.	Rasna	Most successful and most favourite drink among the children, kind of soft drinks and found in many flavours.
8.	Coffee Powder	It is kind of beverage derived from the roasted coffee beans.

Result and Discussion

In the era of many new advancement in the field of forensic fingerprint, development of fingerprint from the conventional powder are one of the most suitable method but also destructive in nature. But among other chemical methods, powder methods are more preferable. In this investigation, reveals that for different surfaces different kind of non conventional powders were gave the quite good result. Among the on conventional method, the powder with finer grain size gave the better result instead of the slightly larger one. Hence, further studies in this direction are required using more surfaces and the different fine powder which are easily available in the household. However, this paper gives a new direction to the researchers in the field of investigation and many further investigations in this field provides the useful information to develop latent fingerprints with the help of non conventional methods.

Table 2: Development of Fingerprints with different non conventional powder on different substrates.



























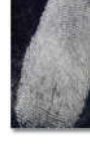








S. No.	Powder used	Substrates				
		Steel	Bronze	Plastic	Glass	Compact Disk
1.	Potato Powder					
2.	Tomato Powder		-			
3.	Rice Flour					
4.	Mint Powder		-			
5.	Onion Powder					
6.	Gram Flour		-			
7.	Rasna					
8.	Coffee Powder		-			-

Table 3: Showing result of non conventional powder on different substrates.

S. No.	Powder used	Substrates							
		Potato powder	Tomato powder	Rice flour	Mint powder	Onion powder	Gram flour	Rasna	Coffee powder
1.	Steel	+	+	+	+	+	+	+	+
2.	Bronze	+	-	+	-	+	-	+	-
3.	Plastic	+	+	+	+	+	+	+	+
4.	Glass	+	+	+	+	+	+	+	+
5.	Compact Disk	+	+	+	+	+	+	+	-

Conclusion

Present study is an attempt to decipher the latent fingerprints with the help of non conventional methods. From the above used powder; rice flour, potato powder, Rasna and onion powder showed the better ridge details as compared to the other non conventional powder used. Rice flour, potato powder, rasna and onion powder shows 80% clear ridge details on the different substrate but the other shows only about 50–60% ridge details. These new powder proved to be quite useful in the visualisation on different surfaces. Hence, it concludes that when there is scarcity of conventional powder the non conventional powders also gave quite useful result in decipherment of the fingerprints. These powder also the cost effective and easily available. With the majority of these powder, the first level ridge details were seen but in some of them third degree ridge details were ascertained. (Table 2)

Abbreviation: No abbreviation were used

References

- Nandy A. Identification principles of forensic medicine 2nd edition. New Central Book Agency (P) LTD. Calcutta. 2001:47-109.
- Surinder Nath, 1984. Finger Print Identification, Gita Press, Delhi, 1-15.
- Montain, SJ, et al. "Sweat mineral-element responses during 7 h of exercise-heat stress." International, U.S National Library of Medicine. International Journal of Sport Nutrition and Exercise Metabolism. December 17, 2007.
- RK Garg, H. Kumari and R Kaur, A new technique for visualization of latent fingerprints on various substrates using powder from turmeric: A rhizomatous herbaceous plant (*Curcuma longa*). Egyptian Journal of Forensic Sciences 2011; 1: 53-57.
- Houbing Song, Glenn A. Fink And Sabina Jeschke (2017). Security And Privacy in cyber physical system: Foundations, Principle, And Applications. John Wiley and Sons.
- F M Kerr, F Haque and I W. Barson Organic based powders for latent fingerprint detection on smooth surfaces. Part I. Canadian Society of Forensic Science Journal 1983;16:39-44.
- Subrahmanyam BV. Personal Identity. Modi's Medical Jurisprudence and Toxicology 22nd Edition. Butterworths, New Delhi. 2001:37-40.
- Dusting for Prints. (n.d.). Retrieved from <https://www.safariland.com/fingerprint-powder-guide.html>.