

An Evaluation: Percentage of latent palm prints or part on documents.

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Abstract

In last decade the rapid advancements in forensic science have changed the way of criminal investigation. We have witnessed so many rapid development and changes of new scientific methods and technology, which led's to the unique features & applications of it and become the trend or part of popular culture.

This study is based on the asserted ability to determine the percentage of documents in which latent palm prints or part is present. For this study, 160 samples were collected from Uttar Pradesh, North India in April 2013 and were distributed into four groups for intensification by different methods. It was noted from the intensification that the documents were having the latent palm prints, when treated with battery of powders. The obtained intensified prints with black powder were 97.5%, Iodine Fuming 92.5%, Silver Nitrate 85% and with Ninhydrin 95%, which indicates the presence of latent prints along with writings on documents. All developed prints were clear and having identical information about an individual.

Keywords: Intensification Prints; Percentage; Documents; latent palm prints.

Introduction

In forensic application, the ridges (finger & palm) due to their uniqueness and permanency

are the most reliable evidences. The infallibility of these evidences could only possible by the new scientific analytical methods (Cantu A, & et al., 2003). It has been a long time, since then the identification of suspects from fingerprints and palm prints are accepted in court of law (Almog J., 2001). The evidential value of palm print (Crown D.A., 1969) is clear as about 30 percent of the latent recovered from crime scenes (Edwin O'Neil M., 1937) are from palms, which play an important role in the identification of an individual (Filedhouse Sarah, 2011, Henry J.S., 2012, Jain A. K.& Feng J., 2009).

The ridges are studded with sweat pores which secrete sweat. It must be remembered that while an individual is writing or preparing the works of art, etc. one cannot help touching or holding the surface, a part of the hand (Palm and Finger) resting on the writing surface to give support and facilitating the movement of the hand. Since the finger/Palm has raised lines and furrows having sweat pores which keeps the ridges moist, and hence as it touches the writing surface, it is expected to leave their impression (Palm prints) or lower part of palm (Hypothenar area) on the writing surface or papers. Especially when we signed the documents the part of the palm comes in the contact of the surface. Since sweat is apparently a colorless fluid, so the prints left

behind are not visible to the naked eye; the visibility of the latent prints are only required the intensification (Jain A.K., & et al., 2007, James J.D., & et al. 1991).

By using the different battery of development on papers, it will come know to the investigator whether the prints are available or not (Kerr F.M., & et al., 1983). If present, only then the identification could be possible. It's very rare that an individual writes without touching the surface of paper from the hand or part of hand doesn't put on the document (Lee H.C., & et al., 1991). If the prints are not present (Lennard C.J., & et al. 1988), it may be a cause of disease, atmosphere, or writing habit of an individual (Morris Ron, 2000, McMahan P., 1966). Their may be many other impression of holding or touching the paper, which will be in different positions.

The study was undertaken to determine the percentage of documents, whether the latent palm prints or part thereof is present or not. All the samples were treated with different battery of powders for intensification to know the percentile (Maltoni D., & et al. 2009). By examination it was found that the lower part of palm prints (hypothenar area) were present on the documents below the signatures/writings (Naidu Swati, 2011). The intensified prints were clear and having enough information of ridge details, and identical information of an individual, which can be helping to nab the suspect.

Method and Materials

In the present study, 160 samples including male and female were taken from the villages of Districts Baghat of Uttar Pradesh, North India in 2013. The selection of the subjects was done randomly. After taking the consent of subjects, the subjects were asked to put their signature on white paper sheet of good quality with ball pen (Thomas G.L., 1978). For the development of latent prints,

traditional and easily available methods such as Black Powder, Ninhydrin, Silver Nitrate and Iodine fuming were used, which is usually considered best developer for latent prints (Fresh and Old) on documents.

Methods

The selection criteria of subjects were random, and the consent was taken. The primary information about the subject whether they can put their sign on papers was confirmed. After giving a blank white paper sheet and blue ball pen to the subjects were asked to sit at ease, and to put their signatures. All the individuals were spoken to put their signatures on the sheet at calm and congenial atmosphere.

When individuals were asked to stop the writing, According to the **Mutual Exchange principle** "When ever there are two things in the contact of each other, there will be always a mutual exchange of materials between them". The prints in latent form were also transferred on papers and below to the signature. By carefully handling, the sheets were put in clean white paper envelope at room temperature (McDonald Idu, 2013), so that the dust and other contaminants present in atmosphere couldn't affect the sheets (Rae Laura, 2013).

Development of latent Prints

For the intensification and to see the percentile of documents in which latent palm prints or part there off is present or not, all the samples were divided into four groups. Each group was containing 40 samples, and was treated with trendy & easily available battery used for development on papers during investigation. A number of different methods for latent prints intensification have been proposed. Here we used only four methods-

Black Powder

Most well known and used method for detection of latent prints on papers is black powder. Black powder method is useful for fresh samples which react with the lipid materials (Chitra S. V., & et al., 2013) present in the prints (finger and palm) residue and enhance the visibility of latent prints (Sears V.G, & et al., 2012). After putting all the samples at room temperature for 5-6 hours, were treated with Black Powder. It was seen that latent prints were successfully developed on the paper sheets. The developed prints shown in figure (1) were clear and having enough information about the ridge details and identification of an individual.

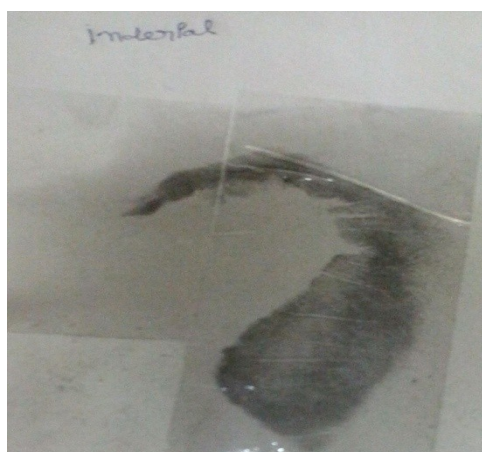


Figure-1

Developed prints from black powder

Iodine Fuming

This method is not often used because of the prints developed through this method can not be kept for records so long without photographed; it starts to fade after some time (Schwarz L., & et al., 2011). The samples were kept on room temperature for 2 days. When the samples were treated with iodine, it reacts with the constituents of latent print and transformed into visible. The developed prints were photographed for the records. Treated samples were identical and carrying enough

information about the identity of an individual.

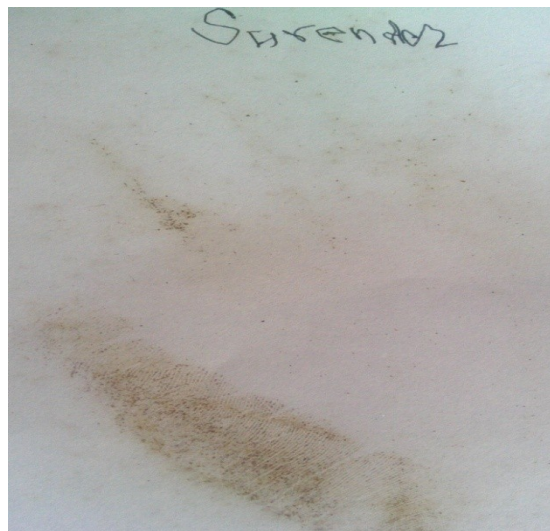


Figure-2

developed prints from iodine fuming

Silver Nitrate

Silver nitrate, which have been used for the development of latent prints about 120 years (Sharma B.R., 1984). It reacts with the chloride present in the residue of sweat. After putting all the 40 samples on room temperature for one week, then were analyzed. The prints developed from this method were having identical information about the individual. As the Resultant, the study shows that silver nitrate solution develops the prints, but these can not be recommended as standard because of the appearance of developed prints (Blackish) and the background of paper (Dark).



Figure-4

developed prints from silver nitrate

Ninhydrin Development

Since 1954, Ninhydrin have become commonly used for reveals prints on papers. After taking the samples, the samples were put at the room temperature. After some time all the samples were put in the separate –separate paper envelope so that the integrity of the samples by keeping contaminants away. All the samples were treated with Ninhydrin (Shen K. H.C., 2002). The Ninhydrin solution was taken into a sprayer and sprayed over the samples; the samples were put on room temperature for 24 hours. Although the print starts to develop after few seconds but for the process of acceleration and to dry the samples, the humidity was increased after 24 hours. The developed prints with this method were clear, identical and having enough information about an individual.



Figure-3

developed prints from ninhydrin

Result and Discussion

It was noticed from the developed palm print present on documents, that when an individual writes on a paper; he/ she always left their identity in form of latent. These prints are needed to be treated with different battery of intensification. Appropriate method with respect of time plays an important role for development of the impression, identification and nabbing the suspects. Conventional application of developing methods can decrease the possibility of less damage. In this study only trendy methods were used to examine, while an individual left behind their impressions on documents or not; and if yes then, what is the percentage? From the application of battery of development of latent prints, different percentages with respect of different time were obtained.

The percentile of documents obtained from the study indicates that it is noticed, that if someone writes on a document always left their latent palm prints, if prints were not found then it may cause of health issues (disease), atmosphere or habit of writing of an individual etc. It is bring to kind notice that the obtained results may only be valid for the atmosphere and place where test was performed, and performance of process could vary in difference climate or from one region to another or one country to another country (You Jane, & et al., 2002, Desai Bhawana & et al., 2013). During the observation, it was found that when the documents were treated with black powder the percentage of developed prints was 97.5%, and when were treated with iodine fuming; it was 92.5%. The results (Shown in table 1) from the application of silver nitrate were 85%, and with application of Ninhydrin it was 95%.

S.no.	Compounds for treatment of samples.	Total Samples	Developed Samples	Percentage of Developed Samples
1.	Black Powder	40	39	97.5%
2.	Iodine Fuming	40	37	92.5%
3.	Silver Nitrate	40	34	85%
4.	Ninhydrin	40	38	95%

Table-1; Diagram of taken samples, developed and their percentage

Once it will come to know that the latent palm prints or part there off is be present on documents or not (Ehsaan S. C., & et al.,2014, Noushin K. S., & et al., 2014). If it is affirmative, only then after taking specimen of the suspects; it would be easier for investigator to identify an individual (A methodology of finger mark research).

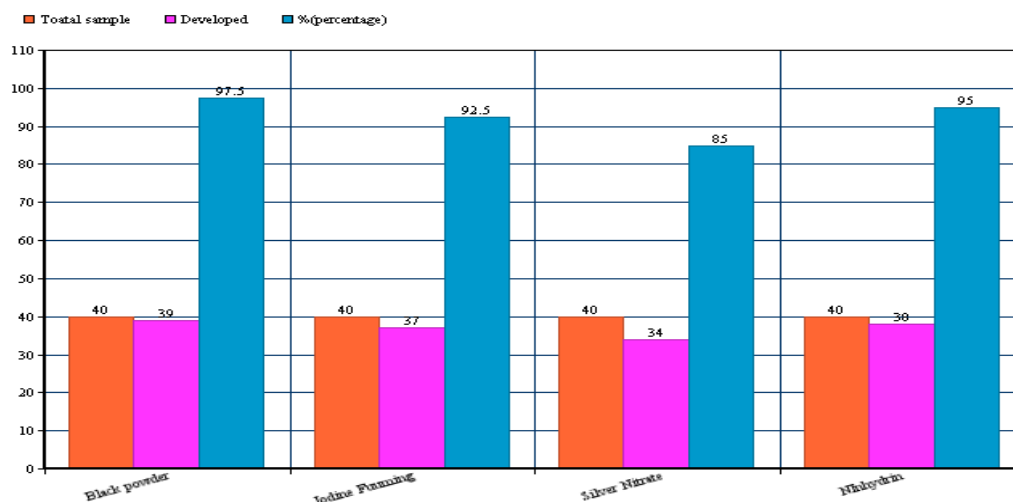


Figure 5; Showing the developed prints from total and their percentage

The above graph (Figure 5), indicates intensified documents from the total number of samples in ratio of developed and the percentage of given samples. This study was evaluated for percentage for intensified impressions by different methods with respect of time.

Conclusion

It's a milestone to accept evidences in court of law and to establish their relationship with suspect. It is obvious a fact that; when two things comes in the contact of each other, their will be some exchange of material between them. When an individual starts to write on a documents, unknowingly left their identity in form of latent palm prints (while resting the hand on paper),

which carry the infallible and unique information about their identity. If the identity of suspect is not possible from the handwritings characteristics; then by the development of latent prints, which is always present below the signature, in line and in rare cases above the writings can be done. It is helpful for nabbing the suspect and along with the handwriting examination it can be put at the par of all evidences in court of law.

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