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An Evaluation: Sexing from the Ridge density of Latent Palm prints of North Indian Population

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Abstract

In addition of being highly utilized for identification and substantiation of suspects, latent prints (Finger & Palms) play a vital role and determination of sex is a crucial facet for intimate identification. Being unique by nature, perpetual and identifiable features of an individual, the possibility of identifying to the suspects from such latent prints confronted from scene of occurrence, even on documents is higher and conclusive. In the present study, 60 samples including (30 male & 30 female) aging from 18-55 years were taken from the population of Uttar Pradesh, North part of India. After the successful development of latent palm prints on documents, the ridge densities were taken from 25 mm^2 diameter. As a denouement, the procured mean ridge densities, if ≤ 11 ridges/25 mm^2 or less then is likely to be from male origin, and ≥13 ridges/25 mm^2 or more then that is likely to be from female origin. In our study, we found that higher ridges densities are found in females in comparison of males which indicate that on the basis of ridge density of latent palm prints; the differentiation of sex from the latent palm prints can be done successfully.

Keywords: Latent prints, identification, ridge density, documents.

Introduction

In many instances, the identification of the suspects relay on the evidences (Latent prints) encountered from the scene of occurrence[1-3]. In forensic identification & investigation field, the latent prints (Palm and Fingers) have their own significance and utmost importance which carry the suspects to the prosecution level in court of law[4-7]. Such kind of latent prints require careful intensification and examination for the purpose of identification. Identification of individual through palm prints is infallible because of its nature (Uniqueness, permanent).

It must be remembered that while writing or preparing the works of art, etc. one cannot help touching or holding the surface, a part of the palm resting on the writing surface to give support and facilitating the movement of the hand. Since the Palm/ fingers have 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 impressions of the lower part of palm (Hypothenar area) in latent form on the writing surface or papers[8-11]. Being a colorless fluid of the sweat; the prints so left behind are not visible to the naked eye and the visibility of the prints are enhanced[12, 13].

To estimate the sex of suspect from the ridge density of latent palm prints is challenging and no work has been carried out yet related to this. In this study, an attempt has been done to do sexing from the ridge density of such latent palm prints from the documents in 25 mm^2. It was found that the ridges density of latent palm prints of males and females have a significant difference and females have more far ridges in 25 mm^2 in comparison of the male[14, 15]. A conclusive identification of sexing from ridge density of latent palm prints was done which will be helping for forensic experts and Investigator's to nab a suspect[16, 17].

Material and Method

For the present study, all the 60 samples including (30 male and 30 female) were selected from the population of Uttar Pradesh, North part of India. All the samples were taken randomly. All the individuals were asked to write something on a white paper A4 size sheet with their consent. According to the mutual exchange principle, the latent prints were transferred on the white sheet. For developing the latent prints, traditional and easily available method Black Powder, was used, which is usually considered best developer for latent prints on documents.

Methods: For sampling, 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. 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, so that the dust and other contaminants present in atmosphere couldn't affect the sheets. The developed prints shown in figure were clear and having enough information about the ridge details and identification of an individual.

Table-1
Table for ridge density of male and female

Ridge count for male	Male	Female	Ridge count for Female	Mean of Ridge density for male	Mean of Ridge density for female
10	9	7	12	10.97	13.03
11	13	16	13		
12	8	7	14		

Results 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 method (Black powder) was used for development of latent prints which helping to determine the sex of an individual from the ridge density of latent palm.

It was noticed for the study the female has greater ridge density then male. In 25mm^2 area, it was found the male have thicker ridges while female have thinner ridges which increases the number of count per ridges. In some cases, if the female is mostly busy with watery work then tearing of ridges can be encountered and ridge count in a area can be increase (mostly the Palmar area), while the male who works in fields or a laborer; the ridges are found thicker. In this study , after studying all samples it was observed that, If the ridges counts comes ≤11 ridges/ 25 mm^2 then the gender of the suspect is likely to be from male origin and if the ≥13 ridges/25 mm^2 or more then that is likely to be from female origin.

Once the gender of suspect will come to know from the latent palm prints or part then after taking specimen of the suspects; it would be easier for investigator to identify an individual (A methodology of finger mark research).

Conclusion

Palm prints, which are infallible by the nature of its uniqueness and often encountered on the scene of occurrence. These prints, which are far away from the knowledge of the experts, can provide the identity of suspects. In this study we tried to find out the sex from the latent palm prints of north Indian population and got that latent palm prints having a lot of information about the age, sex and nature of the suspects. At scene of occurrence, the lower part of palm (Hypothenar area) is encountered. By the study we found that in comparison of male female have greater ridge density in a 25mm^2 . It's a milestone to accept evidences in court of law and to establish their relationship with the gender of suspect. Once the sexing could be done, then it's become easier for the investigator nab the suspect.

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