



RESEARCH ARTICLE

DEVELOPMENT OF CHEILOSCOPY IN THE ADMINISTRATION OF JUSTICE IN INDIA

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ABSTRACT

In the modern era of advancement and technology, a lot of investigative technologies have emerged. Now a day, when crime rate is increasing very highly at the same time, new investigative technology has take over the traditional practices and plays a credential portrayal in nabbing the actual culprits. In an investigation, law enforcement agencies rely on the diversified evidences and correlate them as a link between the culprit and victim. Cheiloscropy, which is understand the finger prints (unique, perpetual and universal) of any culprit in an investigation establish the conclusive identification of culprit. Identification relies on the numerous elevations and depressions that form patterns on external skin of lips like fingerprints. In this study, we collected 100 samples including male and female of age-group (15-30) years and established identification on the basis of their individual characteristics. From the resultant, it was concluded that the presence of prints vary on the time and if successfully. The minimum 12 individual characteristics were observed for male category, while for female the individual characteristics were obtained at 95% of confidence of level.

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INTRODUCTION

In the juridical pasture, the positive identification of culprit through the diversified aspects of evidences has been depleted since a long time. Any vestiges of clue that may be left over the crime scene are used to hoist out the information about any suspected person (Sharma preeti *et al.*, 2009, Chhaikara Pankaj *et al.*, 2011). Since very early phase of investigation, certain bodily countenance that makes individuality of every person has been used for identity such as DNA fingerprints, palm prints (Divedi Nidhi *et al.*, 2013). In the modern era, metric systems have changed the specific mean of individuality in form of their usage. Retina patterns and fingerprints come across to establish the identity of suspect in forensic (Sundharam *et al.*, 2001, Hirth *et al.*, 1975). Cheiloscropy (lip prints), technique is used to endowed the identity of any individual by the presence of lip prints over any surface. Lip prints are understood perpetual, unique and reliable means of identification due to numerous elevations and depressions that from the pattern on external skin of lips like to the fingerprints (Augustine J *et al.*, 2008, Maheswari *et al.*, 2001). In the last decade, Cheiloscropy attracted the investigators as a new tool of human identity in criminal issues. Now a day, the sexual harassment cases in our society are coming in light very rapidly which are tactful and sometime un-detailed (Sharma Vivek *et al.*, 2014, Hamazah *et al.*, 2014).

Although awareness about the advanced techniques, that is used in criminal identification have alarmed the criminals from taking sufficient precautions, yet they make mistakes and leave another aspects as their identity in form of lip prints on the body of victim, cigarette butts, eatable, crockery used for drink etc. (Govinvakar *et al.*, 2009). By enlightening with the fact that possibilities to identify any suspect from the lip prints with conclusion such as age gender etc. is wider. Lip prints can also be further used for the DNA process to confirm who this person may be for sure (Karki *et al.*, 2012, Sharma *et al.*, 2013). Lip prints have proved its own valuable and evidential significance in any investigation which that deals with the new systematic techniques and forensic examination of the furrows, wrinkles and cracks present on the red part of human lips (Gharmy *et al.*, 2003). Anthropologist R. Fischer, was the first analyst to describe the lip prints and their uniqueness. These lines and scrunch present on human lips that are present on human lips that looks a like the usual outlines and cracks present at the region of transition of external and internal layer of skin (mucosa) forming uniqueness like fingerprints and establish an identity of an individual for legal, social and personal reasons (Utsanao *et al.*, 2005). These devoid friction corrugations which have been used now a day for the evidential purpose of identification are for lip impression (Shah *et al.*, 2013). These impressions have been verified and examined which could be recovered after gone through the alterations such as trauma, inflammation, herpes etc. (Shah *et al.*, 2015). Even being genotypic, it is dissimilar in identical twin. It is quite possible that some hereditary resemblance like

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the fingerprints (Class & individual characteristics) could show identical characteristics between the parents and offspring. The presence of the lip prints on the scene of occurrence is not most frequent; it may be occasionally left behind or intentionally left over the scene to distract the investigators from the league. Such prints can be confronted in any condition from the scene of occurrence (Latent form, visible or semi visible) which could be needed a treatment of intensification for consequence of identification. These impressions smears over a crime scene are encountered on various surfaces especially on the wine glass, love letters, eatables (fruits and vegetables). Mostly, the lipstick coated prints are encountered and considered a key in the solving of crime. These types of prints required a careful attention for development, verifiable and a comparative examination as a baseline to fix an identity. With the changing time, the investigators also looking upon the lip impressions for the conclusive identification of dubious instead of the traditional evidences such as, anthropology, odontology, fingerprints etc. (Tschihashi *et al.*, 1974). In this study, the identification of the suspect was concluded on the basis of the class and individual characteristics of labial mucosa (outer layer) of lip prints. The intensified prints were comprised with the lateral prints (specimen) over a document. It was observed that, the prints were encountered in various forms such as static, half static and dynamic form. By studying the intensified prints, it was concluded the static and half static prints were carrying the identical information about the individual while the dynamic prints were not clear. Dynamic prints are the resultant of smerged prints which occurred by overlapped lip prints over the surface. This technique associates the identification of individuals based on the characteristics of the labial mucosa or lips traces marks as one of the most important transferred evidence. On the basis of the variations in lip impression patterns, the gender of the suspect also can be identified. Analysis of the variations in lip patterns can differentiate between two genders which will standardized the system of gender identification in forensic field. It has been noticed that the environment does not affect the furrows and grooves of the lip impression. So, this study can also used for the gender inequity which will minimize the number of suspects. This study is less expensive, time saving and useful for the investigation of any case and to nab the suspect behind the bars.

## MATERIALS AND METHODS

For this study, all the samples were collected from the population of Delhi between the age group 15-30 years. The sample selection was done randomly and the consent of the individuals was taken prior to the experiment. All the specimen was took over the A4 size white paper after the application of red colour lipstick. During the collection of questioned samples, All the individuals were asked to put their lip prints on various surfaces such as glass, paper sheet and vegetables. Now, all the samples were put separately from each other to avoid any kind of destruction at room temperature for 5-8 hours.

### Methods

All the latent prints present on the various surfaces were treated with the help of different types of powders which is commonly used for the intensification of fingerprints. After successfully intensification, all samples were comprised with

the specimen under the stereo-microscope at the magnification power of 10 X. All the samples were photographed by using the Samsung galaxy S-4 phone at 16 megapixels. The clarity of photographs depends upon the available tool used for photography. In figure 1, the intensified lip print over a glass has been shown. Below in Figure-1,



Figure 1. Intensified lip print over a glass

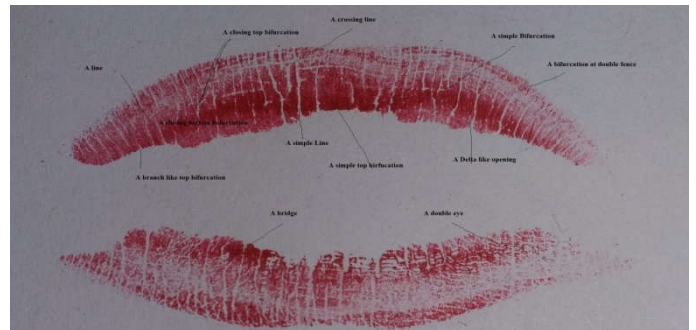


Figure 2. The individual characteristics present in the lip print



Figure 3. Simple printed lip prints over a document

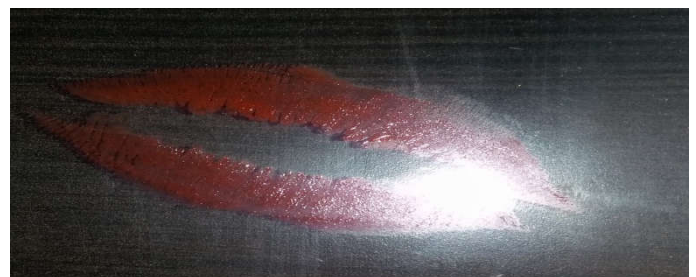


Figure 4. The imprinted lip prints over the door of a cupboard

## RESULTS AND DISCUSSION

As per the experience and investigation, it is very well known to all that the prints are encountered in latent form and the intensification is required to get the information about the culprit. So, in this study; all the latent prints were firstly intensified and studied. During the intensification, it was observed whether all the intensified samples were having enough information of friction devoid and wrinkles. When

these prints were treated, it was observed that most of the collected sample from male was clear and ridges were having minutiae details of individual characteristics. The intensified samples as per their category are shown below in the given table-1. The percentage of the intensified lip prints that were having the clarity of all individual characteristics in male was 76% while in female it was highly noticed 92%. The half statistical characteristics were highly noticed in male 20% in comparison of female 8%. Even some of the prints were failed to establish the identity on the basis of these characteristics, such lip prints are counted in the dynamic prints. These prints can occur either by the repetition of labial mucosa at same surface again and again and thus prints become smerged. It has been cited from the available review that the identification from surged print is not possible by using the individual characteristics. The statistical analysis of the intensified prints is given below in table -2.

**Table 1. Indicates the number of intensified prints of both genders**

Subjects	Total no. of samples	No. of clearly intensified prints	No. of half static prints	No. of dynamic prints
Male	25	19	5	1
Female	25	23	2	0

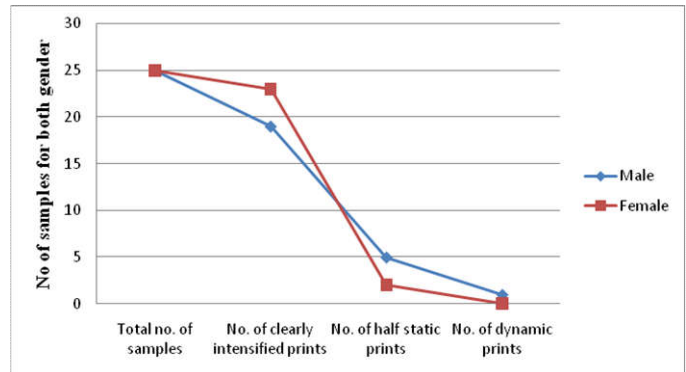
**Table 2. Represent the percentage of success rate of identified prints**

Subject	Success rate from clear prints	Half static prints	Rate of Failure
Male	76%	20%	04%
Female	92%	08%	00%

By the above discussion, only the intensification of the prints and their significance for identification was discussed. Once, it is known to us that the prints are available on the surface in that case further investigation can take place. During this study, the numbers of individual characteristics for both of gender were noticed. Since, it is well known to all of us those female use lipsticks or other types of glossy materials to keep moisten their lips in comparison of male has more chances to leave their prints over any surface. While male lip prints are mostly encountered on the wine glass, or in love letters. In this study, it was contemplated that 12 individual characteristics were highly noticed in male individual characteristics while female have about 14 identical characteristics for conclusive identification. The standard deviation I male was 1.666 and in female 2.170 at 95 % of confidence level. The variance have identical significance at 95% of confidence level, the variance value is 2.77 for male and highly valued in female cases as 4.71. During this study, the standard error was  $\pm 0.3823$  for male characteristics and it was  $\pm 0.4525$  for female individual characteristics. The comparison table -3 is given below and shown in it. The representation of the successfully intensified lip prints are shown in the given graph-1. This shows the significant difference between the intensified characteristics for both genders. Form this conducted study, it has been observed that the lip prints can be intensified from the different surface which can be encountered from crime scene. Based on these prints, the information can be obtained about the individual and even about the gender. In this case the DNA information can also be obtained from the present saliva over the surface. If any external material (lipsticks, glossy etc.) is firstly sighted at crime scene, it is estimated the gender may be female.

**Table 3. Represent the statistical values of for both of the genders in accordance of the individual characteristics**

Variables	Male	Female
Standard Dev.	1.666	2.170
Variance	2.77	4.71
Mean	12	13.43
Standard Err.	0.3823	0.4525



**Graph 1. Represents the intensified characteristics between both of the genders sample**

**Credibility in Justice System**

This study was taken to prove the potential vital role of the lip prints in the forensic investigation and to make the understanding that a little clue/impression can be so harmful for a suspect to be identified. Like to the other impression evidences such as fingerprints, palm, and sole prints, cheiloscopy still does not exist most frequently as a tool of human identification (Navaro *et al.*, 2006). We have to prove the potentially importance of lip prints and to look out for any new identical characteristics in forensic field. With the ever-increasing pressure placed upon law enforcement agencies to facilitate the physical evidences linking to a suspect of a crime. This makes a sight to utilize the evidences to provide the identity of an individual that is prerequisite for personal social and legal aspects. Lip prints, which are perpetual and individual by nature, are referred to as persistent prints and can, provide a direct relation between a suspect and crime scene. These prints can be revealed as a stratified surface trace with visible furrows, because of the deposition of sebaceous glands secretion along with sweat glands which secretes the organic and inorganic material. These enable the intensification of the invisible prints. In the case when the lines are not clear (only the shape of the lips is printed), individual identification of a human being based on this trace is extremely difficult (unless the trace contains more individual characteristics, e.g. scars), and often identification ends with group identification. In these cases it is possible to examine the substance which constitutes the trace e.g. saliva, as a biological trace. However, if the lip impressions are screened with residue of food or some other artificial or nonessential and the impressions are not visible clearly, than the material can be examined for the chemical analysis to testify the source of material. Lip traces with clear furrows and lines and other individual constituents enables the identification of a human being. By the aspect of evidence, lip impressions have similar value of fingerprints, palm prints and sole prints. The Importance and evidential value of the lip prints seems in the literature and with that it can be put on the bar of other evidences in court of law.

## Conclusion

In forensic investigation, to expose the suspect is the ultimate challenging task by that an investigator confronted every time. A tinge of any kind can be pragmatic to revealed any case and fleck the oversight of the crime scene. The premises of lip prints as a constant anatomical structure in all times are perpetuity and uniqueness that is the robust flyspeck in the examination of lip prints which holds the potential of identification and can convince the court of law. To decree and resumption of latent lip impression is not a difficult from the object of crime scene. For positive identification, lip prints trim can be used as one of the arbalest against the suspect. Lip prints can be looked specifically on cutlery and crockery items at the scene of occurrence which can ascertain the gender and conclusive identification of the suspect. The battery of intensification such as powder method or the fuming method can be applied which can be later on compared with the specimen of suspect. To find out the definitive conclusion, nevertheless, no need to evaluate the larger samples. Their use (Lip prints) in forensic identification is rather justified which is not requiring specific instrumentation. The significant gender dimorphism can be made from the lip prints. By the mean of cheilo-scopic techniques, it has equal in value to other types of forensic evidence and can be included in evidence for presentation in court.

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