# **CHEILOSCOPY : LIPS DON'T LIE**

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## Abstract

This is a study of lip prints done on the subjects from Karnataka in India. Lip prints from 50 male and 50 female subjects were collected and analysed to determine the predominant lip print type, to establish the uniqueness of lip prints which aids in personal identification and also in evaluating the permanence of lip prints. The middle 10mm of the lower lip was taken as study area as this is the area most often found at a crime scene. The lip prints were obtained by using lipstick and cellophane tape. The lip prints were studied and classified according to Tsuchihashi's classification of lip prints. It was found that type I (complete vertical grooves) was most common in the subjects chosen for the study.

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Keywords: Cheiloscopy, lip prints, identification

#### Introduction

Identification of a person is of paramount importance in any medicolegal investigation, both civil as well as criminal cases. Identity means the determination of the individuality of a person. Article 6 of the Universal declaration of human rights states that everyone has the right to recognition everywhere as a person before the law. Therefore, every citizen of a member state of the United Nations has a right to possess his personal identity, unquestioned.<sup>1</sup>

The wrinkles and grooves on the labial mucosa called as sulci labiorum forms a characteristic pattern called as lip prints. The study of lip prints is known as cheiloscopy.<sup>2</sup> Cheiloscopy is the forensic investigation technique that deals with identification of humans based on lip traces. Cheiloscopy is derived from Greek word, cheilos means lips and

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skopein means to see.<sup>3</sup> The wrinkles and grooves visible on the lips have been named as 'Sulci labiorum rubrorum'.<sup>4</sup> Production of lip prints on the objects is based on locard's principle, i.e, when any two objects come in contact, there is always a transfer of materials from each other. Dental identification, finger print and DNA comparisons are probably the most common techniques used inindividual identification. However, since they cannot always be used, an alternative mode of identification is cheiloscopy. Where identification is concerned, the mucosal area of the lip holds the most interest. This area, also called the klein's zone, is covered with wrinkles and grooves that forms a characteristic pattern - the lip print. The importance of cheiloscopy is linked to the fact that lip prints are unique to one person, except in monozygotic twins. Like finger prints and palatal rugae, lip grooves are permanent and unchangeable. It is possible to identify lip patterns as early as the sixth week of intrauterine life.<sup>3</sup> From that moment on, lip groove patterns rarely change, resisting many afflictions, such as herpetic

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lesions. Lip prints are considered to be the most important forms of transfer evidence and are analogues to finger prints.<sup>5</sup>

Fischer in 1902 was the first anthropologist to describe the furrows on the red part of the human lips.<sup>6</sup> However, it was only in 1932 that Edmond Locard, one of France's greatest criminologists, recommended the use of lip prints in personal identification and criminalization.<sup>7</sup> In 1950, Synder reported in his book, Homicide investigation that the characteristics of the lips formed by lip grooves are as individually distinctive as the ridge characteristics of finger prints.8 Suzuki, in 1967 made detailed investigations of the measurement of the lips, the use and collar of rouge, and the method for its extraction to obtain useful data for practical forensic application.<sup>9</sup> Cottone, in 1981 reported in his book Outline of Forensic dentistry, that cheiloscopy is one of the special techniques used for personal identification.<sup>10</sup>

### **Materials and Methods**

Lipstick of a bright red colour and nonglossy, transparent cellophane tape and glued on one side, unglazed white bond paper, scissors, magnifying lens and tissue paper.

Subjects were 50 males and 50 females of the state of Karnataka, aged between 18 and 25 years. All the subjects were 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year students of Dr.B.R.Ambedkar medical college, Bengaluru. The cases with gross deformities of lips like cleft lip, ulcers, traumatic injury on the lips and cases with known allergy to the lipstick used were not included in the study. Subjects were informed about the study and written consent was obtained prior to recording the lip prints.

#### Procedure

The subjects were asked to clean his/her lips with water and dry them with tissue paper. The subject was asked to open his/her mouth and lipstick applied in a single stroke on both upper and lower lips evenly. The subject was asked to rub the lipstick evenly on all parts of the lips. The glued portion of cellophane tape was applied gently over the lips with even pressure for few seconds to allow the print to form on the tape. The tape was carefully lifted from the lip avoiding any smudging of the print. If the print was satisfactory then the strip of cellophane tape was pressed gently over the white bond paper with a finger in order to obtain a neat and optimal print. Then the subjects name and other details in the form of right and left sides were noted. A line was drawn at the centre of the two lines, ie, the centre of the lips vertically downwards to a point below the cellophane tape. 5mm on either side of the line, two parallel lines were drawn and all the three were joined at the lower end. These lines showed 10mm of the lower lip, which was the area to be studied. The piece of bond paper with lip prints was placed under the magnifying lens and middle 10mm of the lower lips were studied. The determination of pattern depends upon the numerical superiority of properties of the lines on this study area. The grooves in this area were classified according to Tsuchihashi's classification of lip print types. These were:

Type I	: Clear cut grooves running vertically
	across the lip
Type I'	: The grooves are straight, but disappear half way
Type II	: The grooves fork in their course

Type III : The grooves intersect

Type IV : The grooves are reticular

Type V : The grooves do not fall to any of the types I to IV.

## Observation

In the present study it was observed that out of total lip prints studied including both males and females, type I was the most frequent (28%), followed by type III (22%), type II (20%), type IV (18%), type I' (7%) and type V (5%). Type I was the most common lip print type. No two lip prints matched with each other, thus establishing the uniqueness of lip prints. To ascertain if lip patterns change with time, we recorded and analysed lip prints of 10 males and 10 females once again after three months. The lip print patterns were the same as before. This shows that lip patterns remains unchanged during an individual's lifetime and confirms the permanence of lip prints.

## Discussion

The present study revealed that middle portion of the lower lip shows type I as the predominant type, in both the sexes. Other works on Indian subjects have yielded varying results. Sivapathasundharam, Prakash and Sivakumar studied the lip prints of Indo-dravidian population and noted that type III was prominent.<sup>5</sup> T.N.Uma Maheshwari had done her study on lip prints in Chennai and found that type II was prominent.<sup>11</sup> Annie.J.Verghese, Somasekar and Umesh babu in their study among the people of kerala noted that type IV was prominent type. These studies reveal that lip prints show racial differences which can be a useful adjunct to identification of the person.<sup>12</sup>

Lip prints bring added evidence to a crime scene that can be valuable, especially in cases lacking other evidence, like finger prints. Lip prints can be a factor in many different kinds of crimes, such as tape when a person has been bound or gagged, prints on a glass that a person drank from, prints on cigarette butt and prints on a glass or a window if they were pressed up against it. All of these are potential places where lip prints may be found and used in the investigation of a crime.<sup>13</sup> In recent years, lipsticks have been developed that do not leave a visible trace when they come in contact with different items. These lip prints are characterized by their permanence and are referred to as persistent lip prints. The use of lipsticks is not indispensable for leaving lip prints. The vermillion border of the lips have minor salivary and sebaceous glands, which together with the moisturizing from the tongue, leads to the possibility of the existence of latent lip prints. The identification of latent print evidence is often considered the key in solving a crime.<sup>3</sup> Many reagents such as magnetic oxides, aluminium oxides, fluorescent dyes such as nile blue and nile red are used to develop latent lip prints similar to the finger prints.<sup>13</sup>

## Conclusion

Lip prints remain as a constant anatomical structure in all times and are unique to an individual. These observations establish that lip prints are characteristic of an individual and behold a potential as a supplementary tool in individual identification, where other commonly used identification sources are not available. In addition, a standard and uniform procedure needs to be put forth for the collection, the development, recording and computerized analysis of the lip prints. Further work on the subject can help to make cheiloscopy a practical reality at the ground level of forensic identification process.

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