



## LIP PRINT PATTERN RECOGNITION IN BANIYA POPULATION OF STATE OF HARYANA

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**Abstract:** *The present study has been carried out with the aim to study the frequency of predominant lip pattern present in the baniya community of Haryana state in India. The 100 lip print samples were collected from males and females of baniya community of Haryana region. All the lip print samples were examined and studied for major pattern and type of individual characteristics (minutiae's) with the help of magnifying glass and stereomicroscope. It has been noted from the study that most common patterns in selected community was found to be branched pattern and reticulate pattern as least common pattern. The frequency of ten individual characteristics was assessed in selected community samples.*

**Keywords:** *Lip prints, Unique, baniyan, population, individualistic*

### INTRODUCTION

Numbers of evidences are exchanged and left at the crime scene by the criminal after performing criminal activity as per the Locard's Principle [1]. Evidences left by the criminal at the crime scene belong to different categories of physical evidences. The exchanges of fingerprints, footprints, lip prints are observed at the crime scene. Lip prints are one of the evidences which act as an important corroborative evidence for the identification and individualisation. Lips comes in frequent contact with saliva, dust, food and other oily particles that when comes in contact with any substance leaves a specific ridge pattern. A lip print encountered at the scene of crime can lead to the conclusion as character of the event, the number of people involved, sex, cosmetics used, habits, occupational traits and pathological changes of themselves. This evidence helps proving or disproving the involvement of suspect in any criminal activity.



Chelioscopy has been studied on the red part of human lip which helps the crime scientist in an unusual way and nowadays helps in personal identification [2-3]. Lip prints have been classified on the basis of detailed analysis of the lips measurements along with the use and the color of rouge to obtain useful data for forensic application [3]. Number of studies has been conducted to develop the classification of lip prints [3-4]. Researchers have carried out studies taking into account different aspects of the lip prints like stability, sex determination and morphological patterns among different groups of population [5-15]. The aim of the present study is to determine the predominant lip print pattern among baniya community of Haryana region in India. The study of ten selected individual characteristics among lip print samples of selected population and frequency of them in both males and females samples.

## **MATERIAL AND METHODS**

The study of lip print identification is carried out on baniya population of Haryana in India. For the study, 100 lip prints samples of individuals were collected. All the individuals were in the age of 18 to 30 years. These samples included 50 males and 50 females. Lip prints were collected on a simple white A4 sheet. Subjects with inflammations, trauma, malformation, deformity and surgical scars and other abnormality of lips were excluded because of their unsuitability for their investigation.

The lip prints were taken with very simple method in which lips were cleaned with a soft cloth piece gently and then lipstick was applied on them in uniform manner. The subject was asked to press their lips on clean white paper. The student particulars such as name, age were noted on same sheet. The observation on lip prints were made on middle area of lower lip prints for main pattern as well as individual characteristics examination [2, 3, 13] (Table 1-2). The lip prints obtained by this method were examined by magnifying glass and under stereomicroscope. In the present study, classification of Suzuki and Tsuchihashi was chosen for examining the major pattern [2-4] (Table 1, Figure 1). The observations made after examination of recorded and evaluated.

## **RESULTS & DISCUSSION**

The results of lip prints collected from one hundred subjects of baniya community from state of Haryana in India have been interpreted and evaluated. It has been noted from the study that predominant pattern observe in selected community is Type II branched groove present in 52 samples. The main branched pattern i.e. Type II is followed by Type I and Type



IV pattern present in 25 and 23 number of samples respectively whereas none of the lip print samples fall in the classification category of Type III and Type V. It has been noticed that Type I and Type IV pattern is present in almost equal frequency in collected samples i.e. 25 and 23 respectively (Table no.3, Figure 2 & 3).

It has been further observed that lip print pattern that appeared predominantly in of males of baniya community from Haryana is branched pattern i.e. Type II with 36 in number. The branched pattern in male is followed by Vertical i.e. Type I which is present in 12 samples and reticulate pattern noticed in only 2 samples (Table 4, Figure 4).

It has been further observed that lip print pattern that appeared predominantly in of females of baniya community from Haryana is reticulate pattern i.e. Type IV with 21 in number. The major pattern in females is followed by branched pattern i.e. Type II which is present in 16 samples and vertical pattern noticed in 13 samples (Table no.5).

Similar studies have been conducted on lip print patterns of different populations that showed that Type II i.e. branched pattern is predominant in Indo-Dravidian population and Pondicherry population [6-12]. One of the study revealed that Type II is the most predominant pattern in males, followed by Type I, Type III and Type IV patterns. In females, Type I appears to be the most predominant pattern followed by the Type III, Type II, Type IV in Pondicherry population [6]. Studies have been conducted that noted Type I as the most frequent pattern [8].

The results of individual characteristics observed in lip print subjects of baniya community from Haryana have been assessed (Table 6). All samples are analysed for presence of individual characteristics. Ten individual characteristics which are observed in the 100 samples of lipprints are eye, hook, bridge, line, and dot, rectangle like, group of dots, simple top bifurcation, simple bottom bifurcation and crossing lines [14].

Individual characteristic eye is observed in total 66 samples, out of which it was present in 32 and 37 males and females samples with frequency of 54% and 74% respectively (Table 6).

Hook individual characteristic is observed in total 64 samples, out of which it was present in 27 and 34 males and females samples with frequency of 64% and 68% respectively (Table 6).

Individual characteristic bridge is noted in total 43 samples, out of which it was present in 16 and 27 males and females samples with frequency of 32% and 54% respectively (Table 6).

Line individual characteristic is observed in total 93 samples, out of which it was present in 49 and 44 males and females samples with frequency of 98% and 44% respectively (Table 6).



Individual characteristic dot is present in total 89 samples, out of which it was present in 41 and 48 males and females samples with frequency of 82% and 96% respectively (Table 6).

Rectangle individual characteristic is observed in total 13 samples, out of which it was present in 7 and 6 males and females samples with frequency of 14% and 12% respectively (Table 6).

Individual characteristic group of dots has been observed in total 23 samples, out of which it was present in 15 and 8 males and females samples with frequency of 30% and 16% respectively (Table 6).

Simple top bottom individual characteristic have been is apparent in total 84 samples, out of which it was present in 43 and 41 males and females samples with frequency of 86% and 82% respectively (Table 6).

Individual characteristic simple bottom bifurcation has been noted in total 73 samples, out of which it was present in 34 and 39 males and females samples with frequency of 68% and 78% respectively (Table 6).

Crossing line individual characteristic is observed in total 51 samples, out of which it was present in 39 and 12 males and females samples with frequency of 78% and 24% respectively (Table 6).

It has been observed from the study that the most common individual characteristics noted in the baniya community of Haryana is line and least common among them is the rectangle characteristic. The samples of males in selected community also carry line (98%) as major individual character for uniqueness followed by simple top bifurcation (86%) and dot (82%) whereas group of dots (30%) and rectangle (15%) as the least noted individual character. Similarly, the females of selected community carry maximum of line character (88%) followed by simple top bifurcation (86%) and simple bottom bifurcation (78%) whereas group of dots (16%) and rectangle (12%) as least observed characteristics (Table 6).

In current study, the presence of different individual characteristics in each sample varies in number and location that denoted that each collected lip prints sample is unique, different and individual in nature. Majority of studies have confirmed the same [13-14].

## **CONCLUSION**

So, the present study concludes that each sample of the baniya community of Haryana region is unique and individualistic in nature based on lip print pattern. The major pattern found in overall community is Type II i.e. branched followed by Type I i.e. vertical across the



lip and Type IV i.e. reticulate. The males of same community carry Type III i.e. branched as predominant pattern followed by Type I i.e. vertical across the lip and Type IV i.e. reticulate whereas the females of same community carry Type IV i.e. reticulate pattern as major pattern followed by Type II i.e. branched and Type I i.e. vertical across the lips. The presence of different major pattern and individual characteristics in both males and female lip print samples can be used in gender identification. So, cheiloscopy has been establishing its unique identity in criminal investigations and investigators should consider it important evidence in court of law.

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## FIGURES

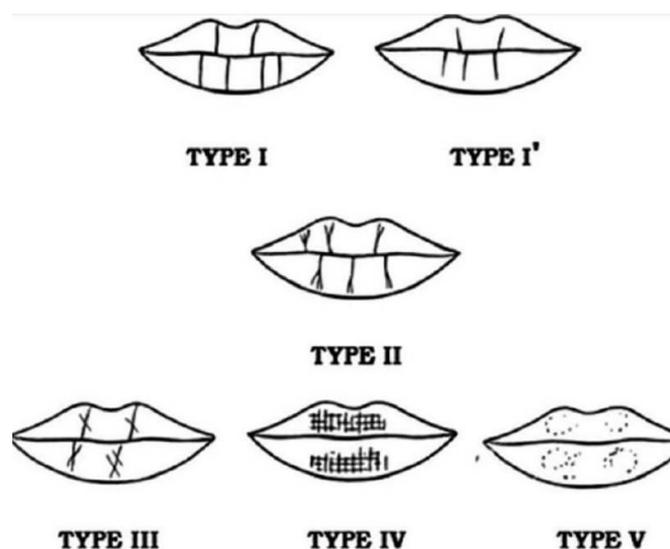


Figure 1 Showing the Suzuki and Tsuchihashi major classification



Figure 2 showing the branched groove Type III pattern



Figure 3 showing the reticulate pattern Type V



Figure 4 showing the branched pattern Type II

## TABLES

Table No. 1 The major classification used in present study given by Suzuki and Tsuchihashi  
[2-3]

S.No.	Type of pattern	Description of pattern
1.	Type I	Complete vertical.
2.	Type II	A branched groove
3.	Type III	An intersected groove
4.	Type IV	A reticular pattern
5.	Type V	Other patterns/Undetermined pattern



**Table 2 Individual characteristic noted during the study**

S.No.	Individual Characteristic observed in the present study
1	Eye
2	Hook
3	Bridge
4	Line
5	Dot
6	Rectangle like
7	Group of dots
8	Simple top bifurcation
9	Simple bottom bifurcation
10	Crossing lines

**Table No.3 Frequency of each patterns of lip prints present in collected samples (n=100)**

S.No.	Types Of Pattern	Number of Patterns observed (n=100)	Frequency of Each pattern (n=100)
1.	Type I	25	25%
2.	Type II	52	52%
3.	Type III	0	0%
4.	Type IV	23	23%
5.	Type V	0	0%

**Table No.4 showing frequency of each patterns of lip prints present in male samples (n=50)**

S.No.	Types Of Pattern	Number of Patterns observed (n=50)	Frequency of Each pattern (n=50)
1.	Type I	12	24%
2.	Type II	36	72%
3.	Type III	0	0%
4.	Type IV	2	4%
5.	Type V	0	0%

**Table No.5 showing frequency of each patterns of lip prints present in female samples (n=50)**

S.No.	Types Of Pattern	Number of Patterns observed (n=50)	Frequency of Each pattern (n=50)
1.	Type I	13	26%
2.	Type II	16	32%
3.	Type III	0	0%
4.	Type IV	21	42%
5.	Type V	0	0%



**Table No. 6 showing frequency of individual characteristics present in collected samples  
(n=100) and males and females each with n=50**

S.No.	Individual Characteristic observed	Frequency of Individual characteristic present in collected Samples	Frequency of Individual characteristic present in males samples (50)	Frequency of Individual characteristic present in females samples (50)
1.	Eye	66	32 (64%)	34 (68%)
2.	Hook	64	27 (54%)	37 (74%)
3.	Bridge	43	16 (32%)	27 (54%)
4.	Line	93	49 (98%)	44 (88%)
5.	Dot	89	41 (82%)	48 (96%)
6.	Rectangle	13	7 (14%)	6 (12%)
7.	Group Of Dots	23	15 (30%)	8 (16%)
8.	Simple Top Bifurcation	84	43 (86%)	41 (82%)
9.	Simple Bottom Bifurcation	73	34 (68%)	39 (78%)
10.	Crossing Lines	51	39 (78%)	12 (24%)