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A Study of Lip Print Pattern Identification on the Population of Delhi

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Abstract

The study of wrinkles and grooves present on the lips; helps in producing the lip prints and the study of lip prints is called cheiloscopy. Lip prints are another one of the most frequently occurred evidence at the scene of crime. As the time is changing and so the forensic science is evolving and becoming vast this evidence also plays a crucial role in today's time. In this paper, the capital of India was chosen for performing a certain study on the patterns comprising in the population. The classification system used is Suzuki and Tsuchihashi method given in 1970. The study comprised of 200 samples from every corner of the union territory. The data was recorded using digital photography. Every lip print was divided into four quadrants manually. In Northern, Southern, Eastern and Western region the frequently encountered lip prints were branched groove, complete vertical groove, reticular groove and incomplete vertical groove respectively. It was concluded that there was vast variety of patterns present in Delhiites whereas the most common and frequent pattern observed were Complete vertical groove and Intersected groove having 23% each respectively whereas Branched groove appeared in the 20% of the total sample population and the irregular grooves were very less to be observed. It can be used for individualization of person belonging to any group. There are certain standards for the study of lip prints which can be used serve as a base for further enhance study.

Keywords: Lip prints; Suzuki and Tsuchihashi classification; Delhi Population

Introduction

Lip prints are characterized as the everyday lines and gaps as wrinkles and depressions present withinside the area of development of human lip, between the inner labial mucosa and outside skin, the research of lip prints is known as cheiloscopy. Like particular mark those are likewise certainly considered one among a kind and feature each character and sophistication attributes. This evidence can likewise be applied in intercourse assurance and to a few increases can understand the inexact age of the character [1]. Lip prints move approximately as evidence in instances like mass fiasco wherein the distinguishing evidence of the character is the actual task to be finished. Lip prints might be left on the wrong doing scenes on exclusive gadgets for example consuming glasses, cigarette butts, and conduit tape. Both direct exam and images permit more and more precise and factor via way of means of factor perceptions required for lip prints examinations. Appropriate exam of the individualizing characters of lip prints is essential to differentiate suspects and in addition verify their fine in wrongdoing scene [2]. The Suzuki and Tsuchihashi classification was used given in 1970 divides the lip prints into five categories: - Type 1 (Complete vertical groove), Type 1' (Incomplete vertical groove), Type 2 (Branched groove), Type 3 (Intersected groove), Type 4 (Reticular pattern groove) and Type 5 (Irregular groove) [3,4]. Fischer turned into the first anthropologist to explain the furrows at the pink a part of the human lips. The use of lip prints has been first endorsed as early as in 1932 through Edmond Locard (1877-1966), certainly considered one among Franceís best criminologists. Lemoyne Snyder in his book Homicide Investigation, written as early as 1950, mentions the viable use of lip prints withinside the identity of individuals [5]. The significance of cheiloscopy lies withinside the truth that lip prints are particular for every person, like fingerprints and palatal rugae. Furthermore, lip grooves are everlasting and unchangeable, as determined withinside the literature [6-9].

Material and Methodology

- Sample – This study focuses on 200 samples obtained from the population including the area of north (east and west), south (east and west), east and west regions of Delhi. The samples were mixed.
- Inclusion criteria – Only healthy lip prints were captured. Lip prints were free from any kind of pigmentation.
- Exclusion criteria – The collection of different samples was not based on age, gender, caste or religion.
- Recording of the lip print – Digital photography was per-

formed by device named canon. The volunteers were made to stand erect with the head positioned in straight manner. The lip prints were recorded without the use of any lipstick or any other material or without using any filters.

Objectives

- To Identify the most common type of lip print pattern present in the population of Delhi.
- To recognize the different lip print pattern in Delhiites.

Procedure for Analysis

1. Once the recording of the print is done. The photograph was transferred on the computer.
2. Each print will be divided into four quadrants namely A, B, C and D.
3. The quadrants were divided moving clockwise, starting from the left side of the upper lip to the left side of the lower lip.
4. Quadrants were manually classified.
5. By using snipping tool each quadrant was cut from the lip print and the pattern was observed.
6. Now different patterns present in each quadrant was observed and the data was formulated in the form of bar-graph on the basis of different regions.
7. After the observation based on different regions was concluded, then the entire data of the population was recorded.

Result

Like other evidences lip prints can also be used for the purpose of identification as proven in the literature [6-9]. Table 1 shows the lip print pattern that were present in different samples i.e., the Type 1, 1', 2, 3, 4 and 5 which are complete vertical groove, incomplete vertical groove, branched groove, intersected groove, reticular groove and irregular groove respectively as per the Suzuki and Tsuchihashi classification given in 1970 [3,4]. Figure 1 shows the distribution of four different quadrants starting from the left side of the upper lip to the left side of the lower lip. The different quadrants were named as A, B, C and D. Table 1 Shows the different Suzuki and Tsuchihashi classification. The Figures 2, 3, 4 and 5 depicts the distribution of lip print patterns in the region of north, south, east and west of Delhi in percent. Figure 6 shows the lip print pattern distribution the total population of Delhi. The Table 2 Shows the comparative analysis of different lip prints found on different regions of Delhi and the

Lip Print	Type
	Type 1 – Complete Vertical Groove
	Type 1' – Incomplete Vertical groove
	Type 2 – Branched groove
	Type 3 – Intersected groove
	Type 4 – Reticular pattern groove
	Type 5- Irregular groove

Table 1: Showing the classification on lip prints observed in the samples

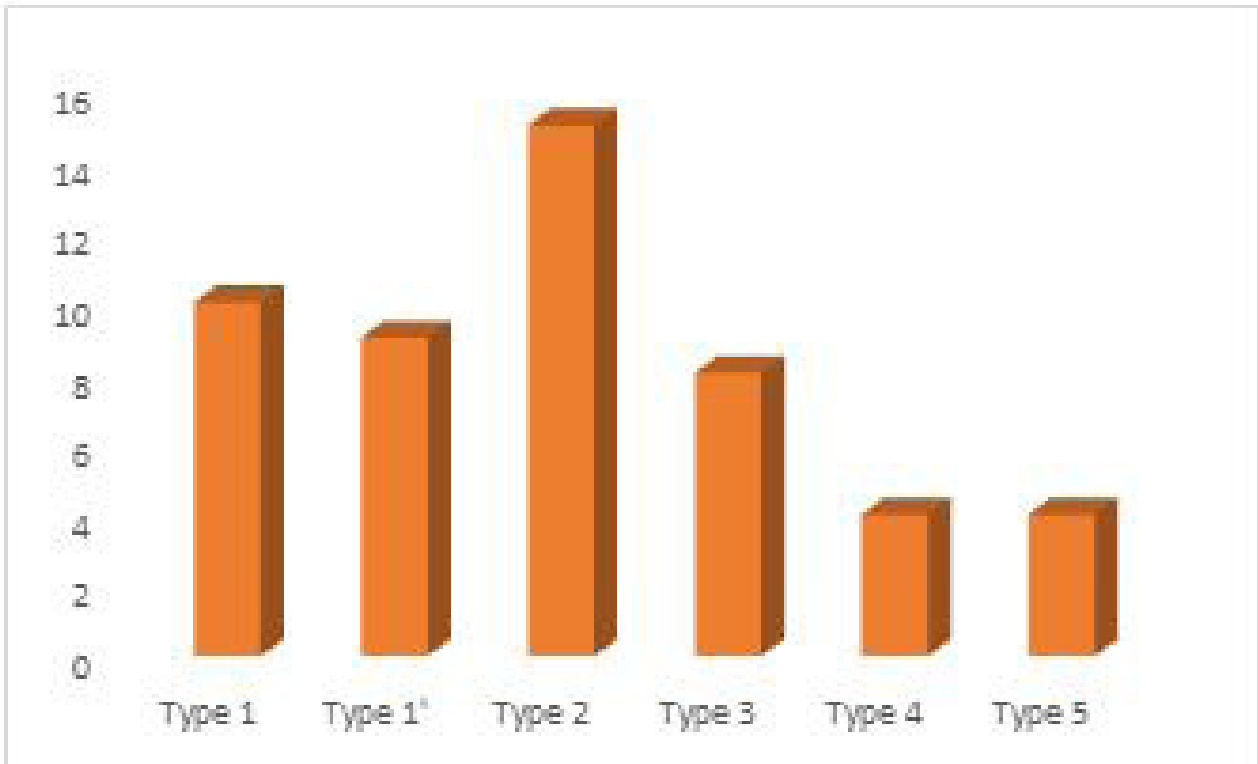**Figure 1:** Showing the distribution of quadrants in the lip print pattern

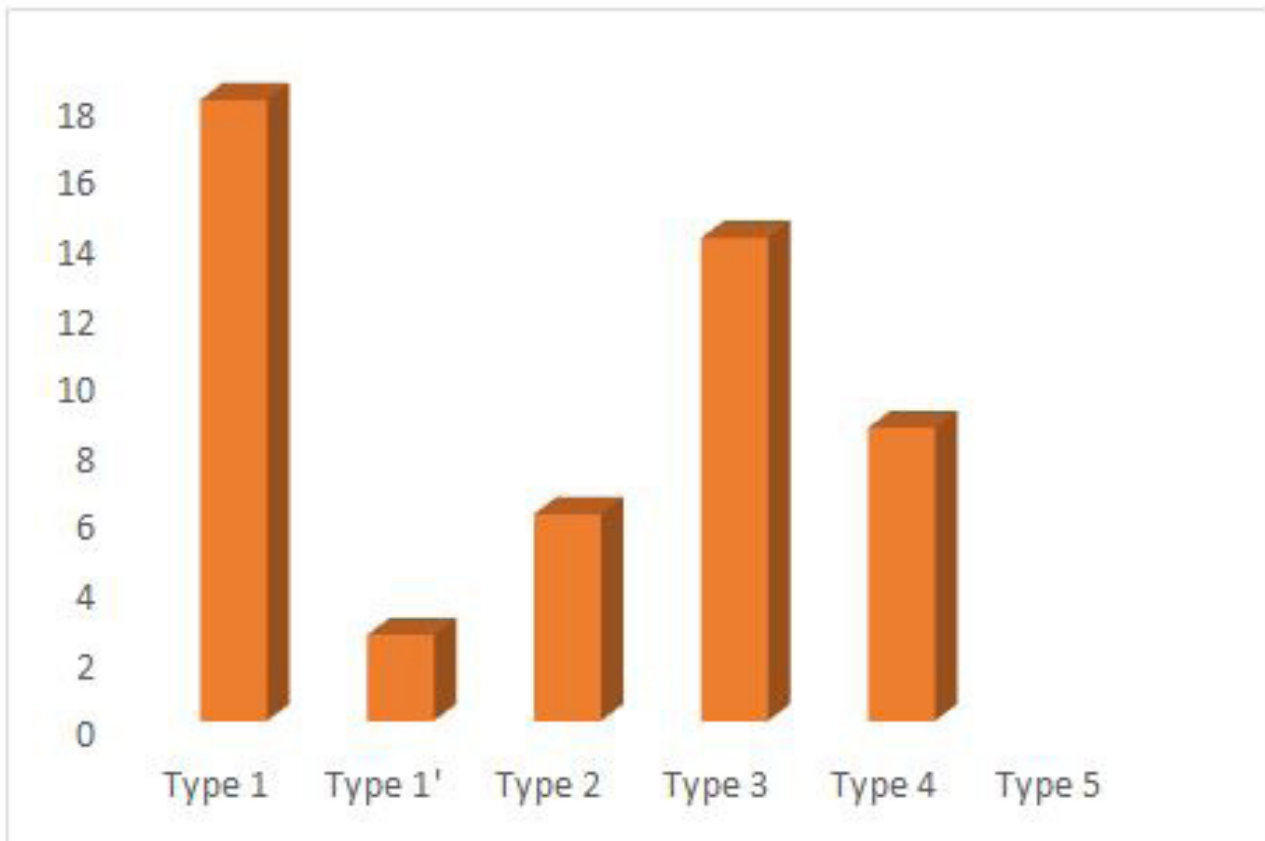**Figure 2:** Depicting the lip print pattern in northern region in percent

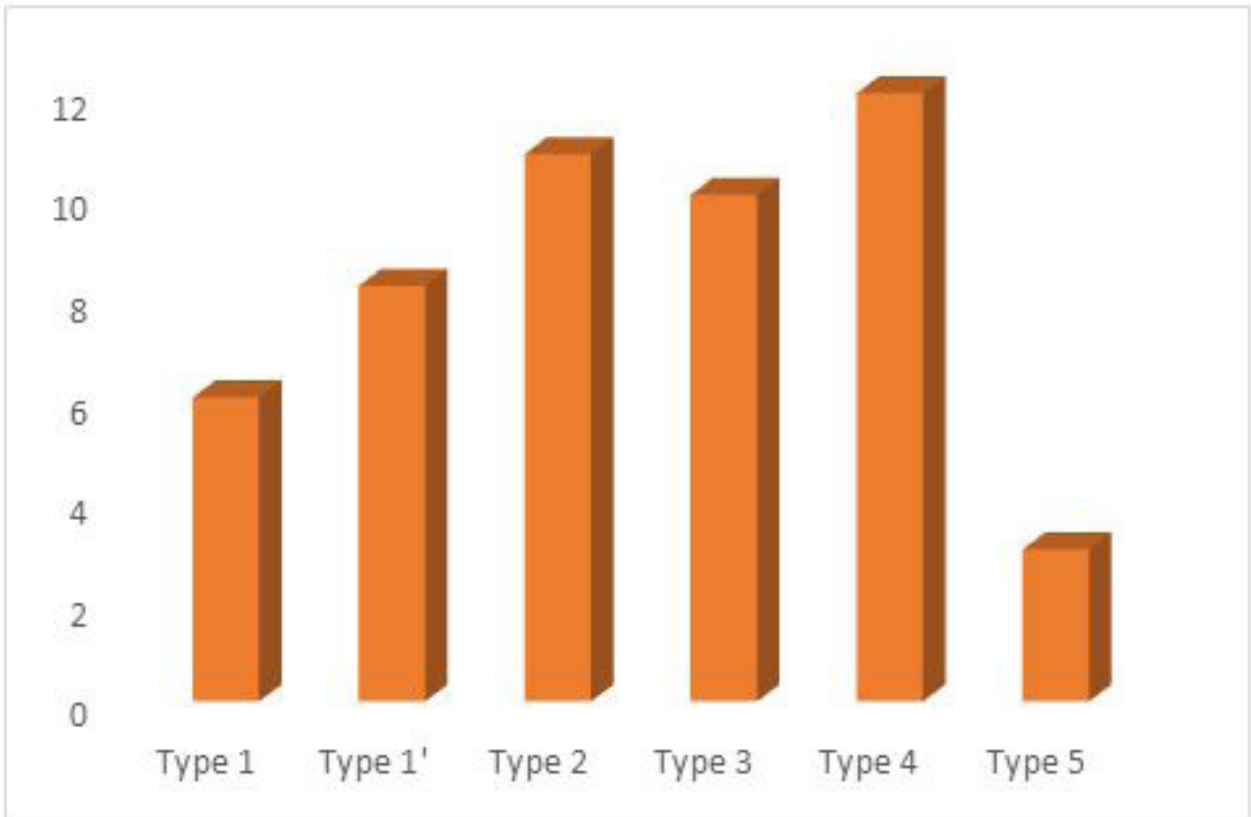**Figure 3:** Depicting the lip print pattern in southern region in percent

Figure 4: Depicting the lip print pattern in eastern region in percent
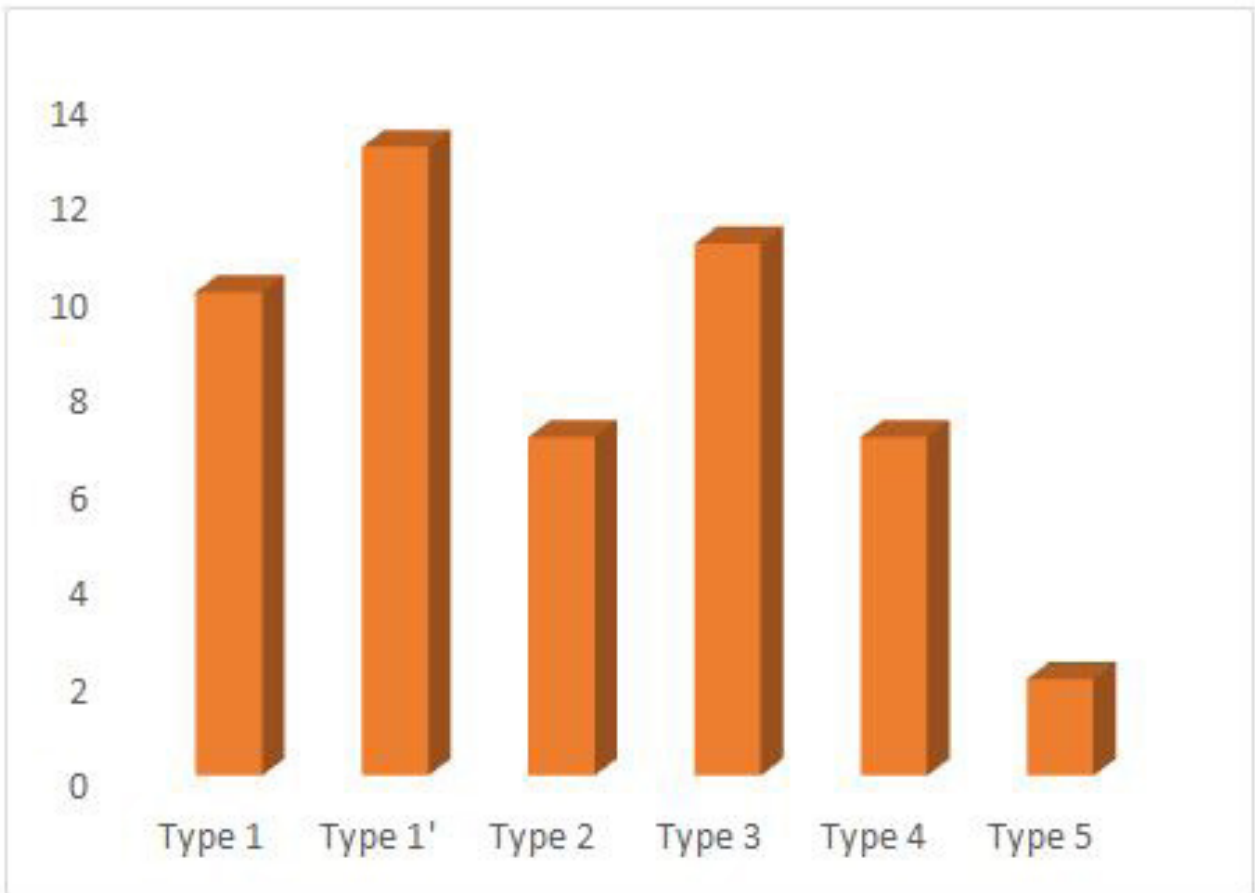

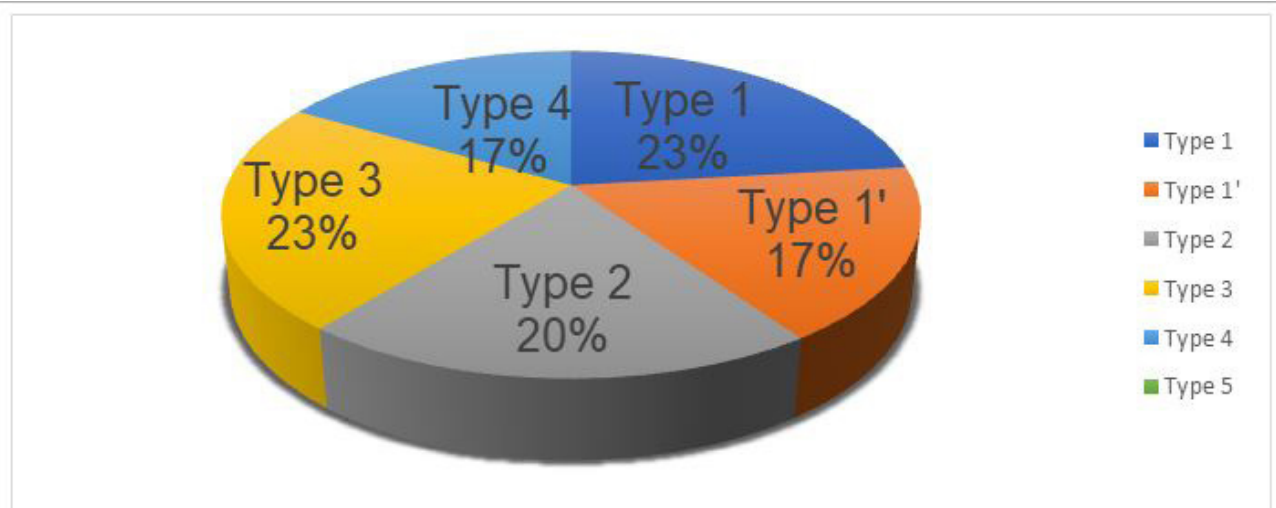**Figure 5:** Depicting the lip print pattern in western region in percent

Figure 6: Showing the total classification of lip print present in the population of Delhi

S.NO	LIP PATTERN	NORTHERN REGION	SOUTHERN REGION	EASTERN REGION	WESTERN REGION
1.	Type 1	10	18	6	10
2.	Type 1'	9	2.5	8.2	13
3.	Type 2	15	6	10.8	7
4.	Type 3	8	14	10	11
5.	Type 4	4	8.5	12	7
6.	Type 5	4	1	3	2

Table 2: Showing the comparative analysis of lip print pattern found in different regions of Delhi
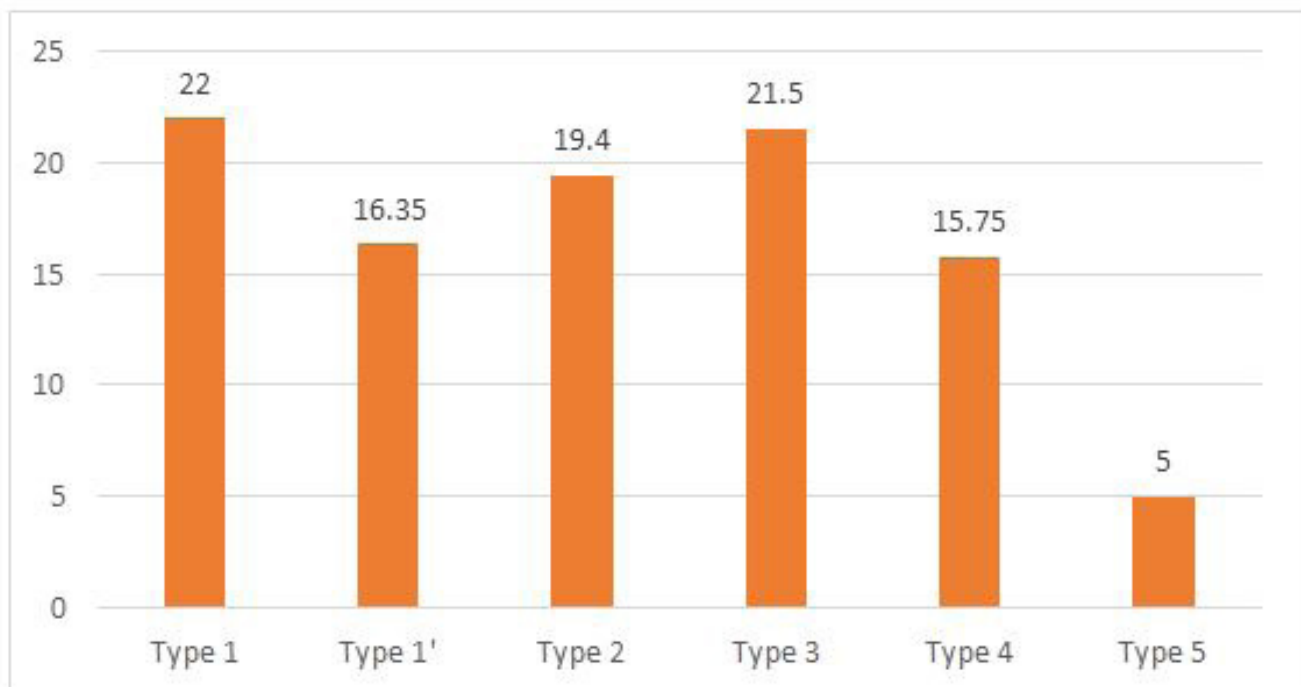

Figure 7: Depicting the comparative analysis of lip print pattern found in different regions of Delhi in percent

Figure 7 shows the comparative analysis of the lip print in percent. These prints are one of the most common evidence easily available on the scene of crime and if analyzed correctly can lead the investigation in the fruitful direction.

Discussion

There was a wide variety of lip prints patterns observed. From the above-mentioned data it can be concluded that the most common type of lip print present in the population of Delhi is Type 1 and 3 which are complete vertical groove and intersected groove respectively having 23%, the second most common type of pattern recognized was Type 2 which is branched groove with 20%. Type 1' and Type 4 which are incomplete vertical groove and reticular pattern groove constitutes with 17% each and Type 5 which is irregular groove was encountered in very few samples. Type 1 is most commonly found in the southern region, least commonly in eastern region. Type 1' is most commonly in western region, least commonly in southern region. Type 2 is most commonly found in northern region, least commonly in southern region. Type 3 is most commonly found in southern region, least commonly in northern region. Type 4 is most commonly found in eastern region, least commonly in northern region. Type 5 is most commonly found in northern region, least commonly in southern region. The reason behind using Suzuki and Tsuchihashi classification is that it is widely accepted. In further studies, I would be dividing the lip prints on the basis of individual characteristics to have a detailed knowledge of how lip prints are categorized among the different regions of Delhi. There is a lot of work already being performed to relate lip prints in identification of gender and also to study the inheritance pattern in the family.

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