



# Morphological Study of Lip Print Patterns among Keralities and Kannadigas

*Libiya Raju*

Department of Social Work, Kristu Jayanti College, Bengaluru

## ABSTRACT

This study examines the morphological variations in lip print patterns among individuals from Kerala and Karnataka, focusing on regional and gender differences. Lip prints, scientifically known as cheiloscopy, are unique patterns formed by wrinkles and grooves on the labial mucosa, making them a valuable tool in personal identification and forensic investigations. The study analyzed lip prints of 100 individuals (50 from Kerala and 50 from Karnataka, equally divided by gender) using the Suzuki and Tsuchihashi classification.

Data collection involved applying dark lipstick to the lower lip, transferring the print onto cellophane tape, and analyzing patterns. Results revealed regional and gender-based differences in lip print types. The incomplete vertical pattern was predominant in males and females from Kerala, while intersect and irregular patterns were more frequent in males from Karnataka. Complete vertical patterns were most common in Karnataka females.

Findings highlight the uniqueness of lip prints and their forensic relevance in determining identity, sex, and regional origin. However, limitations such as a small sample size and challenges posed by the pandemic underscore the need for further research to validate and expand these findings. Lip prints remain a promising scientific tool for personal identification and crime investigation.

## I. INTRODUCTION

Lip prints or Cheiloscopy is the study of characteristic pattern of elevations and depressions on labial mucosa called as sulci laborium. Fingerprints since decades have been used as one of the important tools for personal identification by forensic experts.

### TYPE OF LIPPRINT

Suzuki and Tsuchihashi Classification

1. Complete Vertical: Falls under Type I – Clear vertical grooves covering the entire lip.
2. Incomplete Vertical: Falls under Type I' – Vertical grooves that do not cover the entire lip.
3. Branch Type: Falls under Type II – Branched grooves resembling a “Y” or forked pattern.
4. Intersect: Falls under Type III – Grooves that intersect each other.
5. Reticular Pattern: Falls under Type IV – Grooves forming a net-like or reticular structure.
6. Irregular: Falls under Type V – Grooves that do not fit into any specific category and show irregular or mixed patterns.

## II. REVIEW OF LITERATURE

The 2009 study by Preethi Sharma, Susmita Saxena, and Vanita Rathod highlights the potential of lip prints in human identification and sex determination, similar to fingerprints. Lip prints, formed by the grooves on the labial mucosa (sulci laborium), are unique to individuals and can aid in crime scene investigations. The study, conducted on 20 males and 20 females, used materials like lipstick, bond paper, and a magnifying lens. It confirmed that cheiloscopy is a valuable tool for personal and forensic identification.

The 2009 study by Shailesh M. Gondivkar and colleagues explored cheiloscopy for sex determination, focusing on lip prints as a tool for personal and forensic identification. Conducted on 140 subjects (70 males and 70 females), the study found that Type C was most common in females (47.14%) and

Type B in males (70%), with high accuracy in identifying sex. The research confirmed cheiloscopy's value alongside traditional methods for individual identification.

### III METHODOLOGY

**AIM:** To determine the similarities and dissimilarities of lip prints from Kerala and Karnataka state.

**OBJECTIVES:**

- 1: To identify the similarities of lip prints of people from Kerala.
- 2: To identify the similarities of lip prints of people from Karnataka.
- 3: To study the dissimilarities of lip prints of people from Kerala and Karnataka.

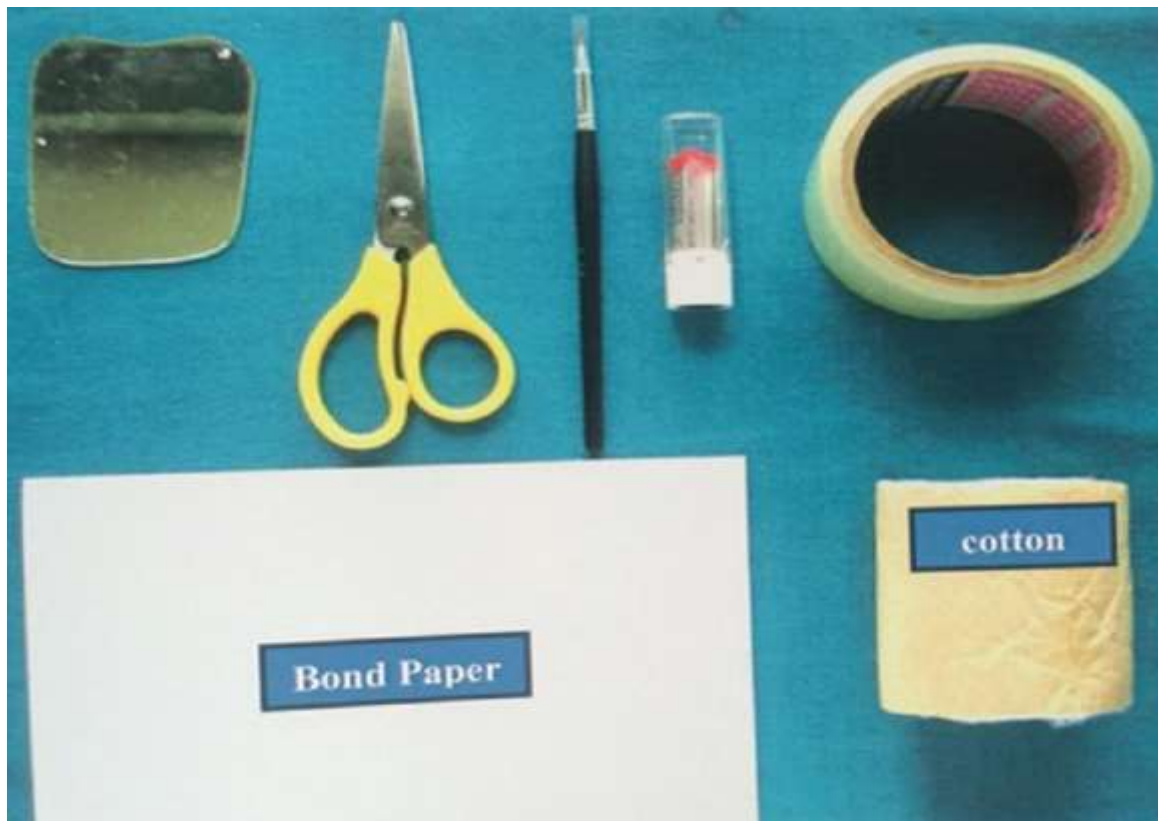
**AREA OF STUDY:** The middle part of the lower lip (10mm) was taken as study area and the wrinkles and grooves on labial mucosa called sulci labiorum form a characteristics pattern.

**RESEARCH:** Recording the lip prints about 25 samples each of males and females from Kerala and Karnataka.

**PROCEDURE:**

**MATERIALS REQUIRED:** Dark lip stick, lip stick remover/oil, A4, scissors, cellophane tape and lens.

- 1: Apply the darkest lip stick on the lower lip of the subject.
- 2: Roll the lips continuously to spread the lip sticks on the middle part of the lower lip. 3: Take impression on glued surface of cellophane tape.
- 4: Stick the cellophane tape on the bond paper in white sheet. 5: Mention the name, age, gender and region of the samples.
- 6: Noted down the pattern and the type of the lip prints in both males and females.
- 7: Distribution of type of lip print pattern among males and females and finding out the majority pattern seen among people from Kerala and Karnataka using Suzuki and Tsuchihashi classification of lip prints.

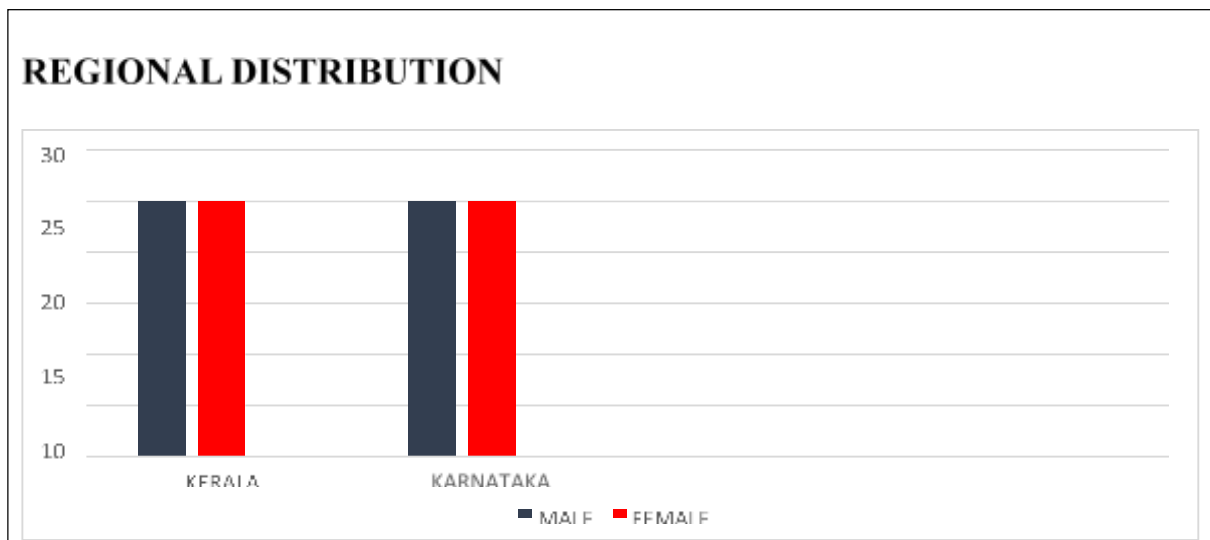


*Fig 1: Materials for recording of lip prints*

#### IV. ANALYSIS AND INTERPRETATION

**TABLE 4.1 REGIONAL DISTRIBUTION**

REGION	NUMBER OF SAMPLES
KERALA	50
KARNATAKA	50



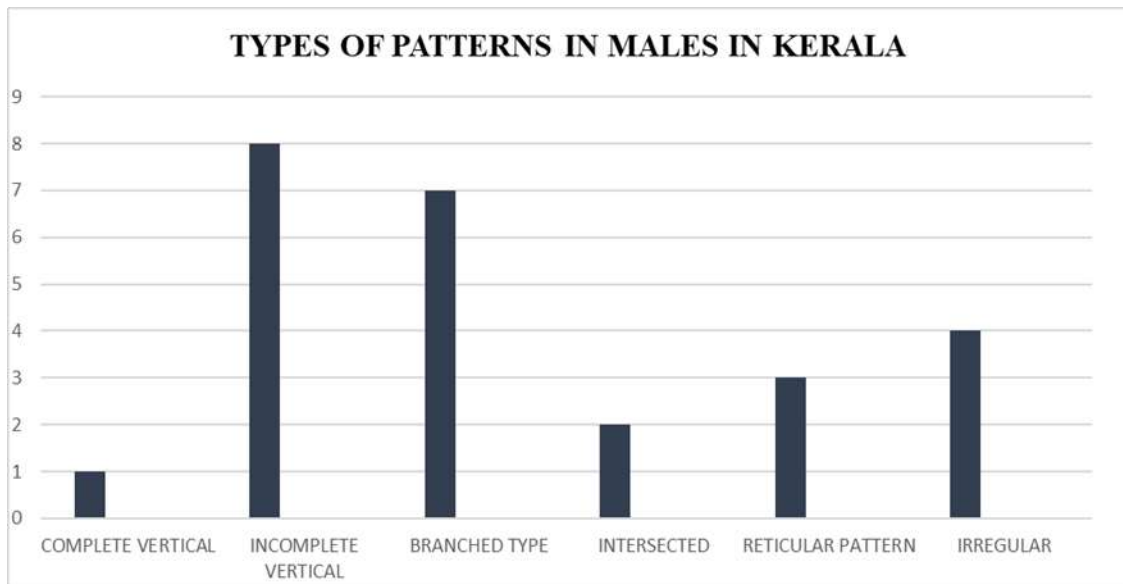
#### INTERPRETATION

Table 4.1 gives the details of the regional distribution and the total number of samples collected in this study. And it shows that the 25 samples of males from Kerala, 25 samples of females from Kerala and 25 samples of males from Karnataka, 25 samples of females from Karnataka were collected.

**Table 4.2**

#### TYPES OF PATTERNS IN MALES OF KERALA

SL.NO	PATTERN	FREQUENCY
1.	COMPLETE VERTICAL	1
2.	INCOMPLETE VERTICAL	8
3.	BRANCHED TYPE	7
4.	INTERSECT	2
5.	RETICULAR PATTERN	3
6.	IRREGULAR	4



#### INTERPRETATION

Table 4.2 gives the details of types of patterns and their frequency of the males of Kerala. In six types of lip print (complete vertical, incomplete vertical, branched type, intersect, reticular pattern, irregular) the most predominant pattern seen in males of Kerala are incomplete vertical pattern of lip print in which, among 25 samples, 8 samples are showing incomplete vertical pattern. And 6 samples are showing the branched type of lip print, 4 samples are showing irregular pattern, 3 samples are showing reticular pattern, 2 samples are showing intersect pattern and 1 sample is showing complete vertical pattern.

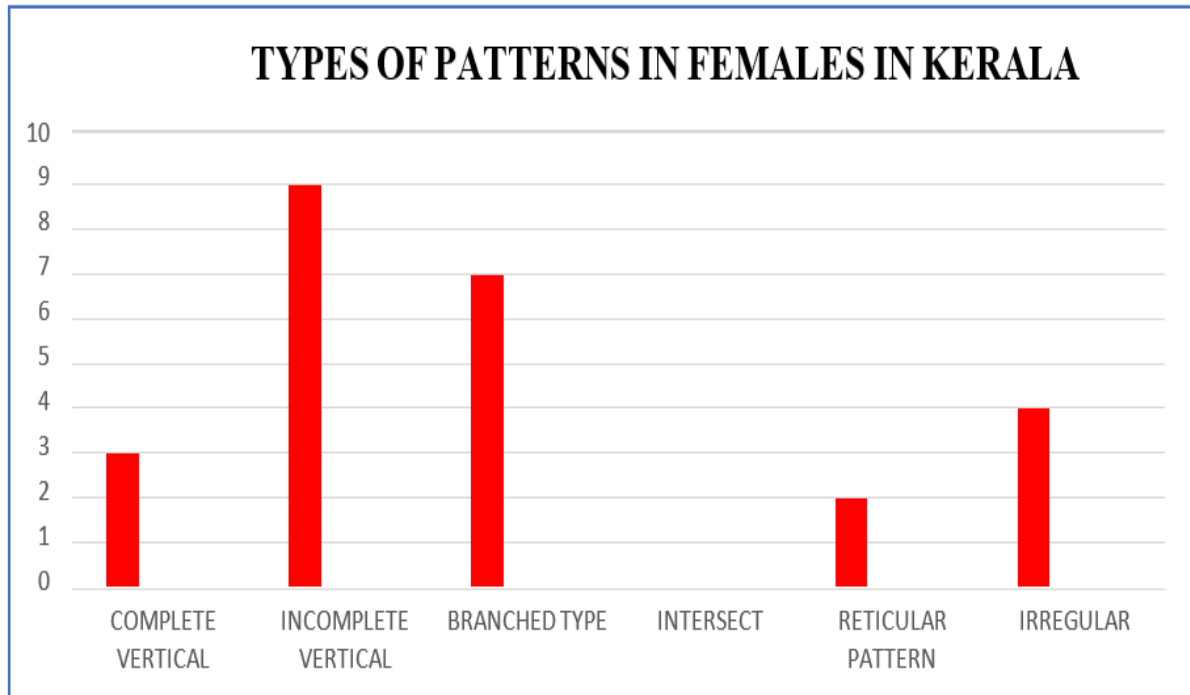
#### INTERPRETATION

Table 4.2 gives the details of types of patterns and their frequency of the males of Kerala. In six types of lip print (complete vertical, incomplete vertical, branched type, intersect, reticular pattern, irregular) the most predominant pattern seen in males of Kerala are incomplete vertical pattern of lip print in which, among 25 samples, 8 samples are showing incomplete vertical pattern. And 6 samples are showing the branched type of lip print, 4 samples are showing irregular pattern, 3 samples are showing reticular pattern, 2 samples are showing intersect pattern and 1 sample is showing complete vertical pattern.

**Table 4.3**

#### TYPES OF PATTERNS IN FEMALES IN KERALA

Sl.NO	TYPES OF PATTERNS	FREQUENCY
1.	COMPLETE VERTICAL	3
2.	INCOMPLETE VERTICAL	9
3.	BRANCHED TYPE	7
4.	INTERSECT	0
5.	RETICULAR PATTERN	2
6.	IRREGULAR	4



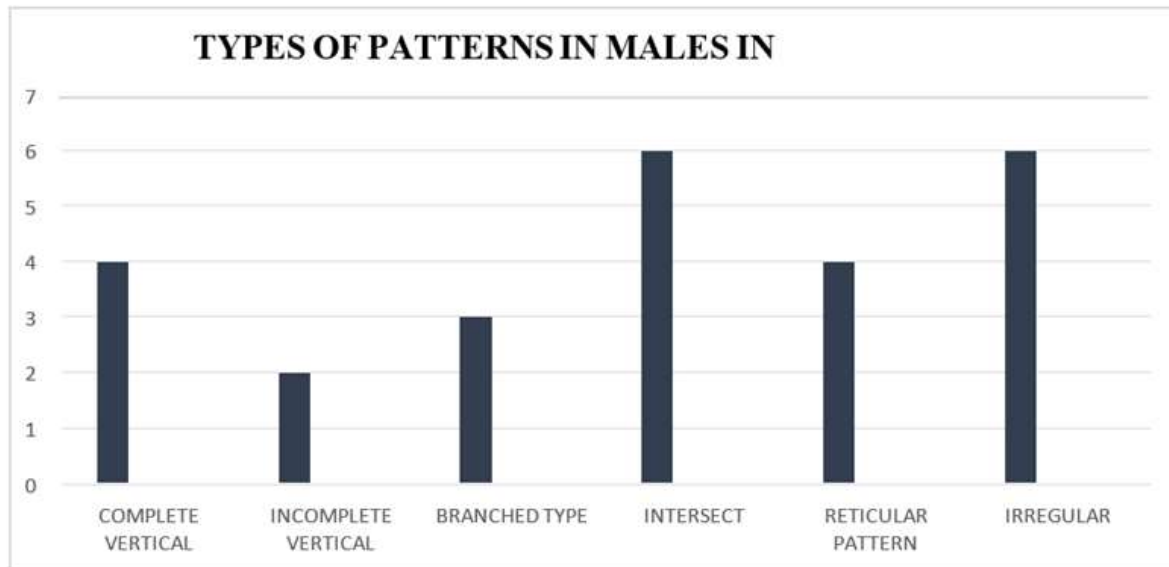
#### INTERPRETATION

Table 4.3 gives the details of types of patterns and their frequency of the females of Kerala. In six types of lip print (complete vertical, incomplete vertical, branched type, intersect, reticular pattern, irregular) the most predominant pattern seen in females of Kerala are incomplete vertical pattern of lip print in which, among 25 samples, 9 samples are showing incomplete vertical, 7 samples are showing branched type, 4 samples are showing irregular pattern, 3 samples are showing complete vertical, 2 samples are showing reticular pattern, 0 samples are showing intersect pattern.

**Table 4.4**

#### TYPES OF PATTERNS IN MALES IN KARNATAKA

SLNO	TYPES OF PATTERNS	FREQUENCY
1.	COMPLETE VERTICAL	4
2.	INCOMPLETE VERTICAL	2
3.	BRANCHED TYPE	3
4.	INTERSECT	6
5.	RETICULAR PATTERN	4
6.	IRREGULAR	6



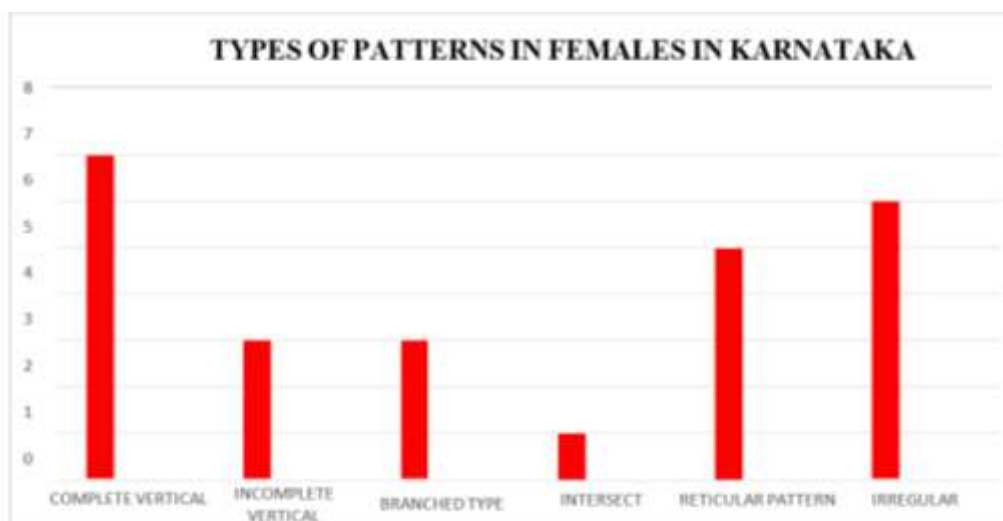
#### INTERPRETATION

Table 4.4 gives the details of types of patterns and their frequency of the males of Karnataka. In six types of lip print (complete vertical, incomplete vertical, branched type, intersect, reticular pattern, irregular) the most predominant pattern seen in males of Karnataka are intersect pattern and irregular pattern of lip print in which, among 25 samples, 6 samples of each of intersect pattern and irregular pattern, 4 samples each of complete vertical and reticular pattern, 3 samples of branched type, 2 samples of incomplete vertical.

**Table 4.5**

#### TYPES OF PATTERNS IN FEMALES IN KARNATAKA

Sl.No	TYPES OF PATTERNS	FREQUENCY
1.	COMPLETE EVRTICAL	7
2.	INCOMPLETE VERTICAL	3
3.	BRANCHED TYPE	3
4.	INTERSECT	1
5.	RETICULAR PATTERN	5
6.	IRREGULAR	6



#### INTERPRETATION

Table 4.5 gives the most predominant pattern seen in females of Karnataka are complete vertical

pattern of lip print in which, among 25 samples, 7 samples of complete vertical, 6 samples of irregular pattern, 5 samples of reticular pattern, 3 samples each of incomplete vertical and branched type, 1 sample is of intersect.

---

## V. FINDINGS AND CONCLUSION

### *FINDINGS*

- There is no lip prints matched with each other; thus, it shows the uniqueness of the lip prints.
- Type I' was most seen in males in Kerala.
- Type I' was most seen in females in Kerala.
- Type III and V was most seen in males in Karnataka.
- Type I was most seen in females in Karnataka.
- Type I was least commonly seen in males in Kerala.
- Type III was least commonly seen in females in Kerala.
- Type I' was least commonly seen in males in Karnataka.
- Type III was least commonly seen in Karnataka.

### *CONCLUSION*

In this study, I focused on regional differences and gender variations in lip prints, identifying the most predominant patterns among males and females in Kerala and Karnataka. Based on this minor study, I observed that Type I' was the most commonly occurring lip print in both males and females of Kerala. In Karnataka, Type III and Type V were the most common patterns among males, while Type I was predominant among females. Conversely, Type I was the least common lip print among males in Kerala, and Type III was the least common among females in the same state. In Karnataka, Type I' was the least common among males, and Type III was the least common among females.

This study highlighted that lip print patterns can vary based on region, making them a valuable tool in crime investigations to narrow down suspects. Similar to fingerprints, lip prints serve as a unique form of personal identification. Furthermore, their uniqueness and reliability make them admissible as scientific evidence in courts of law. Recent studies have also demonstrated the potential of lip prints obtained from crime scenes to help determine the region and sex of individuals.