

## Original Article

# Prevalence of Different Subtypes of Type II Lip Prints among Students of Saveetha Dental College

Meenakshi Mohan, TN Uma Maheswari

From the Department of Oral Medicine, Saveetha Dental College and Hospitals, Chennai, Tamil Nadu, India

ABSTRACT

**Background:** Cheiloscropy, the study of lip prints, is a forensic technique for personal identification. Uniqueness of lip prints such as fingerprints helps to detect the identity of an individual. Various studies about lip prints have been conducted. The present study was conducted to establish the prevalence of subtypes of Type II variety of lip print.

**Aim:** The aim of the study is to find the prevalence and different types of Type II lip prints among 100 individuals from Saveetha Dental College.

**Objective:** To assess the prevalence of Type II variety of lip print. To identify which subtype of Type II lip print is commonly seen. To find whether there is any significant difference in subtypes of Type II lip print between male and female and to evaluate the most common subtype of Type II lip print seen in each compartment of lips.

**Result:** Type IIa is more common among both males and females, followed by Type IIb and then Type IIc .

**Conclusion:** This study has defined the subvarieties of Type II lip prints that were not given by studies of Yasuo Tsuchihashi.

**KEY WORDS:** Cheiloscropy, lip prints, subtype, Type II, uniqueness

Received: February, 2017.

Accepted: March, 2017.

## INTRODUCTION

Personal identification of an individual is becoming increasingly important in legal, medicolegal, and criminal investigations and in genetic research.<sup>[1]</sup> The methods involved in personal identification include anthropology, DNA fingerprinting, and blood group identification.<sup>[2]</sup> Like fingerprints, lip prints are unique to every individual. Lip prints are the physiological wrinkles and grooves on the sulci labiorum which forms a characteristic pattern.<sup>[3]</sup> The study of lip prints is known as cheiloscropy. It is derived from a Greek word “cheilos” meaning “lips” and “skopein” meaning “to see.” Cheiloscropy is a method of identification of a person based on the arrangement of lines on the red part of the lips.<sup>[4]</sup>

The biological pattern of human lips was first noticed and reported by an anthropologist, R. Fischer, in 1902 but failed to suggest its practical use in identification.<sup>[5]</sup> France’s greatest criminologist, Edmond Locard, was the one who recommended the use of lip prints in criminalization.<sup>[6]</sup> The idea of using lip prints in identification was first given by a forensic expert from California, Le Moynesnyder in 1950’s.<sup>[7]</sup> In 1972, Mc Donnell reported that two identical twins had different lip prints.<sup>[8]</sup> In 1990, Kasprzak elaborated the practical use of lip prints in a crime scene from glass, cigar butts, and cutlery.<sup>[9]</sup>

Santos, in 1967, was the first to classify lip patterns into four types:<sup>[10]</sup> straight line, curved line, angled line, and sine-shaped line.

Suzuki and Tsuchihashi, in 1970s, conducted a study and arrived at a classification which was considered to be standard.<sup>[11]</sup>

- Type I: Clear cut groove running vertically across the lip
- Type I’: Partial length groove of Type I
- Type II: Branched groove
- Type III: Intersected groove
- Type IV: Reticular pattern
- Type V: Other patterns.

There are several modifications in these patterns which are not studied much so far. A study has reported the prevalence of different varieties of Type V lip prints.<sup>[12]</sup> No such studies have reported the different varieties in Type II lip prints. Thus, this study was conducted to document the prevalence of different varieties of Type II lip prints among population. There is a need for such specific studies on lip prints to draw more evidence for forensic purposes.

## MATERIALS AND METHODS

### STUDY LOCATION

The study was carried out among the students of Saveetha Dental College and Hospitals, Chennai, Tamil Nadu, India.

**Address for correspondence:**

Dr. Meenakshi Mohan, E-mail: [drmeena.mohan23@gmail.com](mailto:drmeena.mohan23@gmail.com)

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

**For reprints contact:** [reprints@medknow.com](mailto:reprints@medknow.com)

**How to cite this article:** Mohan M, Uma Maheswari TN. Prevalence of different subtypes of type II lip prints among students of saveetha dental college. Int J Forensic Odontol 2017;2:9-12.

Access this article online	
<b>Quick Response Code:</b> 	<b>Website:</b> <a href="http://www.ijfo.org">www.ijfo.org</a>
	<b>DOI:</b> 10.4103/ijfo.ijfo_3_17

**STUDY SUBJECTS**

The study comprised a group of randomly selected 100 students, of which 50 were male and 50 were female. The participants were informed about the procedure prior and informed consent was obtained.

**INCLUSION CRITERIA**

- Students with no active or inert lip lesions
- Students with no known hypersensitivity to lipsticks
- Students willing to participate in the study.

**EXCLUSION CRITERIA**

- Students with known hypersensitivity to lip prints
- Students with active or passive lip lesions
- Students not willing to participate.

**STUDY PROCEDURE**

A uniform film of lipstick was applied over the clean and dry lips with the students' mouth open. The student was then asked to rub both upper and lower lips to spread the lipstick uniformly. The glued side of the cellophane tape was cut and placed over the lips, and a gentle pressure was applied from center to the corner of the lips for few seconds by dabbing. The cellophane tape was then carefully removed to avoid wrinkles and struck over a white sheet of paper. The participants were then given wet tissues and Vaseline to wipe off their lips.

**STUDY METHODOLOGY**

The lip prints were scanned using Hp scanner of 200 DPI resolutions and stored for records. The analysis of these lip prints was done manually with the help of magnifying lens. Typing of lip prints was done using Tsuchihashi classification.<sup>[11]</sup> The lip was divided into four quadrants with three compartments on each quadrant. Hence, 12 compartments were examined from each lip print [Figure 1]. Type 2 lip prints were classified further into three subtypes (Type IIa-Downward fork, Type IIb-Upward fork, and Type IIc-Double sided fork).

**RESULTS**

Six hundred compartments of male and 600 compartments of female prints were examined for Type II patterns. Among males 132/600 compartments and among females 158/600 compartments had Type II lip prints [Figure 2].

Among the 132 compartments in males that had Type II lip prints, 85 compartments possessed Type IIa, 31 compartments possessed Type IIb, and 16 compartments possessed Type IIc. Among the 158 compartments in females that had Type II lip prints, 99 compartments possessed Type IIa, 41 compartments possessed Type IIb, and 18 compartments possessed Type IIc. This reveals that Type IIa is more common among both males and females, followed by Type IIb and then Type IIc [Figure 3].

**DISCUSSION**

The study reveals Type I (36%) lip prints is common among males, followed by Type II (25%), Type III (20%), Type V (11%), and Type IV (8%). In females, Type II (32%) lip prints are common, followed by Type I (26%), Type III (21%),

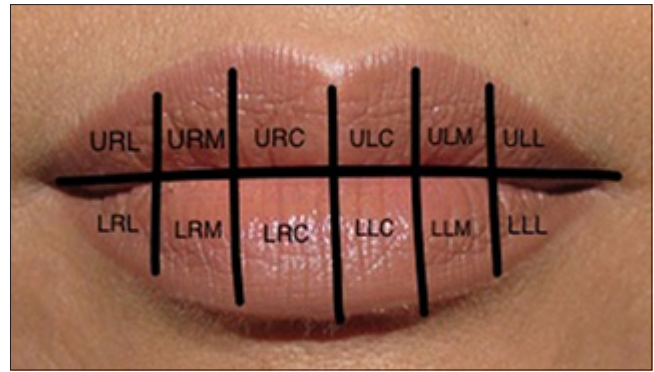


Figure 1: Analysis of lip print in twelve compartments

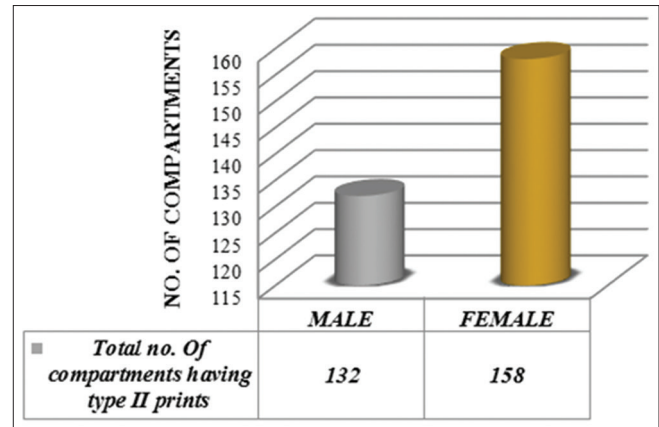


Figure 2: Total number of compartments having Type II prints

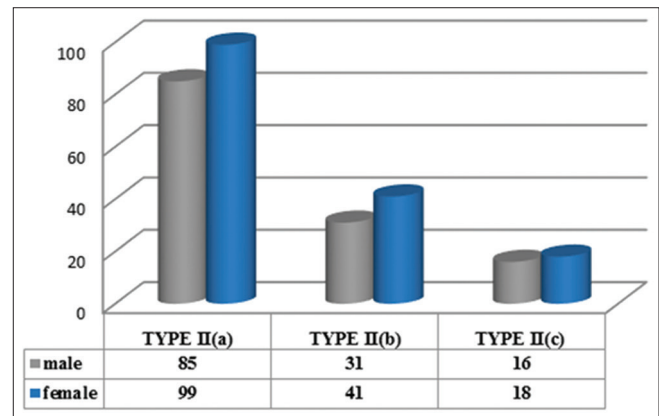


Figure 3: Comparison of different subtypes of Type II among male and female

Type IV (12%), and Type V (9%). There was no similar pattern of lip print seen between any individuals. Thus, all 100 students had their own lip print pattern. Hence, lip print can aid for personal identification just like fingerprints.<sup>[13]</sup>

This study concentrates more on Type II lip prints. Tsuchihashi described Type II lip print as vertical line bifurcating downward and upward in the lower and upper lip, respectively. In our study, Type II lip prints were categorized as a vertical line with fork upward in both upper and lower lip as Type II a, vertical line with fork downward in both upper and lower lip as Type IIb, and vertical line with fork upward and downwards as Type IIc.

**Table 1: Occurrence of subtypes of Type II in each compartment among female**

Subtype	URL	URM	URC	ULC	ULM	ULL	LLC	LLM	LLL	LRC	LRM	LRL
Type IIa	3	7	3	6	8	3	8	19	12	6	18	6
Type IIb	2	3	7	3	3	2	2	3	3	4	7	2
Type IIc	0	1	2	2	1	0	3	4	1	1	2	1

URL: Upper right lip, URM: Upper right middle, URC: Upper right center, ULC: Upper left center, ULM: Upper left middle, ULL: Upper left lip, LLC: Lower left center, LLM: Lower left middle, LLL: Lower left lip, LRC: Lower right center, LRM: Lower right middle, LRL: Lower right lip

**Table 2: Occurrence of subtypes of Type II in each compartment among male**

Subtype	URL	URM	URC	ULC	ULM	ULL	LLC	LLM	LLL	LRC	LRM	LRL
Type IIa	3	7	3	3	8	3	8	14	12	6	12	6
Type IIb	2	3	4	3	3	2	2	3	2	2	3	2
Type IIc	0	1	2	1	0	1	3	3	1	1	2	1

URL: Upper right lip, URM: Upper right middle, URC: Upper right center, ULC: Upper left center, ULM: Upper left middle, ULL: Upper left lip, LLC: Lower left center, LLM: Lower left middle, LLL: Lower left lip, LRC: Lower right center, LRM: Lower right middle, LRL: Lower right lip

**Table 3: Reveals the compartments that predominantly contain Type II varieties in both males and females**

	Female	Male
Type IIa	LLM	LLM
Type IIb	URC, LRM	URC
Type IIc	LLM	LLC, LLM

LLM: Lower left middle, URC: Upper right center, LRM: Lower right middle, LLC: Lower left center

Tables 1 and 2 show the distribution of the different subtypes of Type II lip print among the 12 compartments in males and females. Table 3 shows that Type IIa is commonly seen in lower left middle (LLM) compartment in both males and females. Type IIb is common in upper right center (URC) and lower right middle compartments in males and URC compartments in females. Type IIc is common in LLM compartment in male and LLM and lower left center compartment in females. This shows that each subtype is almost commonly seen in that particular compartment in both males and females. Type IIa was found to be more common in both males and female. Type IIb is the next common and Type IIc is the least common among both males and females [Figure 3].

Several studies on lip prints were done. Studies have showcased the significance of lip prints in personal identification<sup>[14]</sup> and its use in criminal and forensic practices.<sup>[15]</sup> Studies have compared lip prints with blood group,<sup>[16]</sup> fingerprints,<sup>[17]</sup> age, gender, and family.<sup>[3]</sup> Most of the studies have concentrated on the most commonly prevailing type of lip prints using Tsuchihashi classification among male and female. In a study of lip print patterns on fifty males and fifty females, it was found that Type IV was the most common in both sexes.<sup>[18]</sup> In another study, Type II lip prints were most common among both males (31.6%) and females (43.7%).<sup>[19]</sup> A study done by Uma Maheswari and Gnanasundaram<sup>[19]</sup> for a period of 1 year showed consistency of lip patterns without any gross changes. The study has concluded that there was no similarity of lip prints even among siblings. A study by Suzuki *et al.*<sup>[20]</sup> and Uma Maheswari and Gnanasundaram<sup>[19]</sup> found no significant

similarities of lip prints even among twins. Another study demonstrated the different subvarieties of Type V lip prints and their prevalence among male and female.<sup>[12]</sup> There is no specific study about different varieties of Type II lip prints so far. In a study by Uma Maheswari and Gnanasundaram,<sup>[19]</sup> the presence of subvarieties of Type II lip prints was first reported. With this reference, this study was carried out to evaluate the occurrence of different subvarieties of Type II lip prints among males and females.

## CONCLUSION

The present study has established that Type IIa is more common and Type IIc is less common among both males and females. These subvarieties of Type II prints can aid in the identification of criminalization. Thus, this study has defined the subvarieties of Type II lip prints that were not given by studies of Yasuo Tsuchihashi. Further studies can concentrate on different varieties of other lip print patterns which can add quintessence on to Tsuchihashi classification, thus making cheiloscopsy a more precise and a unique one.

## FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

## CONFLICTS OF INTEREST

There are no conflicts of interest.

## REFERENCES

1. Jaishankar S, Jaishankar N, Shanmugam S. Lip prints in personal identification. *J Forensic Dent Sci* 2010;1:23-6.
2. Sharma P, Saxena S. Cheiloscopsy: The study of lip prints in sex identification. *J Forensic Dent Sci* 2009;1:24-7.
3. Randhawa K, Narang RS, Arora PC. Study of the effect of age changes on lip print pattern and its reliability in sex determination. *J Forensic Odontostomatol* 2011;29:45-51.
4. Prabhu RV, Dinkar AD, Prabhu VD, Rao PK. Cheiloscopsy: Revisited. *J Forensic Dent Sci* 2012;4:47-52.
5. Prange A, Ulrich RE, Bøddeker H, Fischer R, Adolf FP. Microanalysis in forensic science: Characterization of single textile fibers by total reflection X-ray fluorescence. *Analytical*

- Sciences 1995;11:483-7.
6. Locard E. Dust and its analysis: An aid to criminal investigation. *The Police Journal* 1993;66:153-65.
  7. Quoted from Yasuo Tsuchihashi. Studies on personal identification by means of lip prints. *Forensic Science International* 1974;3:233-48.
  8. Santos MQ, Queilosophy A. A supplementary stomatological means of identification. *Int Microform J Leg Med* 1967;2:6.
  9. Castelló A, Alvarez-Seguí M, Verdú F. Luminous lip-prints as criminal evidence. *Forensic Sci Int* 2005;155:185-7.
  10. Augustine J, Barpande SR, Tupkari JV. Cheilosophy as an adjunct to forensic identification: A study of 600 individuals. *J Forensic Odontostomatol* 2008;26:44-52.
  11. Suzuki K, Tsuchihashi Y. New attempt of personal identification by means of lip print. *J Indian Dent Assoc* 1970;42:8-9.
  12. Sangeetha GS, Gnanasundaram N, Maragathavalli G, Uma Maheswari TN, Arvind M. Prevalence and different varieties of type V lip prints. *Anil Aggarwal's Internet Journal of Forensic Medicine and Toxicology* [serial online] 2013;14:9.
  13. Tsuchihashi Y. Studies on personal identification by means of lip prints. *Forensic Sci* 1974;3:233-48.
  14. Venkatesh R, David MP. Cheilosophy: An aid for personal identification. *J Forensic Dent Sci* 2011;3:67-70.
  15. Prabhu RV, Dinkar AD, Prabhu VD. Collection of lip prints as a forensic evidence at the crime scene: An insight. *J Oral Health Res* 2010;1:129-35.
  16. Patel S, IshPaul, Madhusudan AS, G Ramesh, Sowmya GV. Study of lip prints in relation to gender, family and blood group. *Int J Oral Maxillofac Pathol* 2010;1:4-7.
  17. Adamu LH, Taura MG, Ojo SA, Dahiru A, Sadeeq A, Umar KB. Relationship of thumb prints and lip prints among Nigerians. *IOSR J Dent Med Sci* 2013;9:12-7.
  18. Patil D, Mugadlimath AB, Hiremath R. A study on lip print types among North Karnataka people. *International Journal of Biomedical and Advance Research* 2013;4:619-22.
  19. Uma Maheswari TN, Gnanasundaram N. Role of lip prints in personal identification and criminalization. *Anil Aggarwal's Internet J Forensic Med Toxicol* 2011;12.
  20. Suzuki K, Tsuchihashi Y. New attempt of personal identification by means of lip print. *Journal of the Indian Dental Association* 1970;17:52-7.