

## Study of Lip Prints for Identification in Forensic Odontology

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**Citation of this Article:** Dr. Mitul Prajapati, Dr. Prakhar Agrawal, Dr. Akil Kureshi, Dr. Saurabh Nayak, Dr. Harsh Shah, “Study of Lip Prints for Identification in Forensic Odontology”, IJDSIR- July - 2021, Vol. – 4, Issue - 4, P. No. 169 – 173.

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**Type of Publication:** Original Research Article

**Conflicts of Interest:** Nil

### Abstract

**Introduction:** Cheiloscopy is the study of characteristic patterns of depressions and elevations, anatomically found on oral mucosa. It is a forensic investigation technique that deals with identification of humans based on lips traces.

**Objective:** The objective of this study is to evaluate the uniqueness of lip prints which helps in personal identification.

**Material and Methods:** The study group comprised of 100 individual out of which 50 were males and 50 were females. The materials used were dark-colored lipstick, paper, cellophane tape, a brush, and a magnifying lens.

**Results:** Most common lip prints in male is Type I while in Female is Type II and most common pattern in both

group is Type II followed by Type I and Type V is the least common type.

**Conclusion:** Lip prints are consistent of an individual for life time; it may be used as a record for individual along with the fingerprints.

**Keywords:** Identification, Forensic Odontology, Lip prints.

### Introduction

Identification plays a very important role in any crime investigation. The traditional methods for personal identification include anthropometry, finger prints, sex determination, age estimation, measurement of height, and differentiation by blood groups, DNA and odontology. [1]

Cheiloscopy is an emerging, cost effective and simple technique. Cheiloscopy is the study of characteristic patterns of depressions and elevations, anatomically found

on oral mucosa. [2] Lip prints are normal Anatomical character of human lips. Cheilosophy has been reported to easier to perform and helpful due to its unique pattern and often more helpful in criminal investigations when other identification methods or parameters are either not available or difficult to analyze. The interesting aspect of cheilosophy is that the wrinkles and cracks of the lips specifically maintain the uniqueness and recordibility when the question of sex determination or of identity of that person comes. Study shows that lip print pattern does not change even as age advances.[3] Since lip prints are unique like the finger prints for an individual, it has also be used as a supplementary tool to verify the presence or absence of a person at the site of crime.[4] The significance of cheilosophy is linked to the fact that lip prints are inherent, once developed at the 6<sup>th</sup> month of intrauterine life they are permanent, unalterable even after death, and unique to each person except for monozygotic twins.[5] The present study was carried out to evaluate the uniqueness of lip prints, their role in personal identification.

### Material and Methods

The study group comprised of 100 individual out of which 50 were males and 50 were females. The individuals having healthy lips without any pathology included in this study. Written consent from individual was taken. The lips of individual were cleaned and a dark colored frosted non glossy lipstick applied in a single motion evenly. Individual asked to make lip in relax position and impression was taken by using glued portion of cellophane

tape and then impression was transferred to paper and subsequently visualized with the magnifying lens. The lip prints were divided into six quadrants; right upper, middle upper, left upper, left lower, middle lower, right lower. In present study, we followed Suzuki and Tsuchihashi classification:

- Type I: Clear cut vertical grooves that run across the entire lips.
- Type I': Similar to type I, but that do not run across the entire lip.
- Type II: Branched groove (branched y pattern).
- Type III: Intersected grooves.
- Type IV: Reticular grooves.
- Type V: Undetermined



Figure 1: Suzuki and Tsuchihashi's Classification

**Observation and Results:** We have observed following results.

TYPE	GENDER	UR	UM	UL	LR	LM	LL
TYPE I	MALE	8%	5%	7.33%	2.16%	6.16%	2.83%
	FEMALE	6.24%	2.33%	5.64%	1.5%	4.12%	2.33%
TYPE I'	MALE	0	0.5%	0	0	0.5%	0
	FEMALE	0	1.5%	0.16%	0	2.16%	0
TYPE II	MALE	4.12%	2.16%	5%	8.34%	1.5%	7.5%
	FEMALE	8%	2.33%	7.33%	12.48%	3.12%	8.34%
TYPE III	MALE	3.12%	2.33%	3.34%	5.43%	1.16%	5.66%
	FEMALE	2.33%	1.50%	3.34%	2.33%	0.5%	3.34%
TYPE IV	MALE	0.5%	6.24%	1.5%	1.15%	3.64%	2.83%
	FEMALE	0.5%	12.64%	1.16%	0.5%	3.46%	0
TYPE V	MALE	0	0	0	0	0	0
	FEMALE	0	0.5%	0.16%	0.16%	0	0

Table 1: Different Lip pattern in different segment of upper and lower lip between males and females. UR: Upper right, UM: Upper middle, UL: Upper left, LR: Lower right, LM: Lower middle, LL: Lower left.

TYPE	GENDER	UPPER	LOWER	U+L	MEAN
TYPE I	MALE	20.33%	11.15%	31.48%	26.82%
	FEMALE	14.21%	7.95%	22.16%	
TYPE I'	MALE	0.5%	0.5%	1%	2.41
	FEMALE	1.66%	2.16%	3.82%	
TYPE II	MALE	11.28%	17.34%	28.62%	35.11%
	FEMALE	17.66%	23.94%	41.6%	
TYPE III	MALE	8.79%	12.25%	21.04%	17.19%
	FEMALE	7.17%	6.17%	13.34%	
TYPE IV	MALE	8.24%	7.62%	15.86%	17.06%
	FEMALE	14.3%	3.96%	18.26%	
TYPE V	MALE	0	0	0	0.41%
	FEMALE	0.66%	0.16%	0.82%	

Table 2: Distribution of different type of lip pattern in both lips in males & females.

RESULT	MOST COMMON TYPE	LEAST COMMON TYPE
MALE	TYPE I (31.48%)	TYPE V (0%)
FEMALE	TYPE II (41.6%)	TYPE V (0.82%)
TOTAL	TYPE II (35.11%)	TYPE V (0.41%)

Table 3: Common and Least common type of Lip prints.

### Discussion

Identity” is a set of physical characteristics, functional or psychic, normal or pathological- that define an individual. Lip prints are recognizable from the 6th week of fetal life. They are not affected by environmental changes, pathologies, minor trauma and inflammation. When lips are impressed onto variety of surfaces (like photographs, glass, papers, windows cutlery, cigarette) the visible morphology and patterns produced by them are important tool for identification of a person. Due to the specific pattern of grooves and wrinkles in lips, cheiloscropy has become an important antemartem identification procedure and a source of circumstantial evidence. It can conclude the character of the event, number and sex of person involved, cosmetics used, habits, occupational trails and pathology present in lip itself. In this study most common lip pattern is Type II (35.11%) followed by Type I (26.82%) and least common type is Type V (0.41%). Gondivkar et al. observed Type II Lip pattern is the most predominant in both lips.<sup>[6]</sup> Verghese et al observed Type III pattern predominantly in both males and females.<sup>[7]</sup> Vahanwala et al observed Type I and I’ pattern mre common in females and in males Type III and IV.<sup>[8]</sup> Sivapathsundaram et al. observed predominantly Type III pattern in males and females.<sup>[9]</sup> Chaitanya Babu et al. observed Type I and II pattern predominantly in females and Type III and IV in males. In different racial and ethnic group lip pattern shows differences in predominant type.<sup>[10]</sup>

### Conclusion

Lip print is absolutely noninvasive process, and could help in the identification process. Because of this, it would be recommended to think about introduction of new records into standard dental procedure.

### References

1. Venkatesh R, David MP. Cheiloscropy: An aid for personal identification. J Forensic Dent Sci. 2011;3(2):67-70
2. Kundu S, Gangrade P, Jatwar R, Rathia D. Cheiloscropy - A diagnostic and deterministic mirror for establishment of person identification and gender discrimination: A study participated by Indian Medical students to aid legal proceedings and criminal investigations. J Exp Clin Anat 2016; 15:31-42
3. Saad W.M., Kameel A.H., Hassan F.Z., El-Otiefy M.A. (2005). Genetic studies on the inheritance of lip prints in cleft and palate. Egypt J Plast Reconstr Surg 29:9-12.
4. Sultana Q., Shariff M.H., Asif M., Avadhani R. (2014). Cheiloscropy: A scientific approach for personal identification. Int J Anat Res 2 (4):668-72.
5. Rastogi P., Parida A. (2011). Lipprints – An aid in identification. Aust J Forensic Sci 44:1-8.
6. Gondivkar SM, Indukar A, Degwekar S, Bhowate R. Cheiloscropy for sex determination. J Forensic Dent Sci 2009; 1:56-60.
7. Verghese A, Somasekar M, Babu U. A study on lip print types among the people of Kerala. J Indian Acad Forensic Med 2001; 32:6-7

8. Vahanwahal S.P., Parekh D.K. (2000). Study of lip prints as an aid to forensic methodology. J Indian Dent Assoc 71:269-71.
9. Sivpathasundaram B., Prakash P.A., Sivakumar G. (2001). Lip prints (Cheiloscopy). Indian J Dent Res 12:234-7
10. Sharma BS, Gupta V, Vij H, Sharma E, Tyagi N, Singh S. Cheiloscopy: A tool for antemortem identification. Indian J Dent Sci 2017; 9:176-80  
students to aid legal proceedings and criminal investigations. J Exp Clin Anat 2016; 15:31-42