

Study of Lip Prints among the Population of Marathi Community

Neeti Kapoor*, Prakash Tiwari**

*. Assistant Professor, Institute of Forensic Science, RTM Nagpur University, Nagpur MH, INDIA

** . Department of Criminology and Forensic Science, Dr. Hari Singh Gour University, Sagar.MP INDIA

Abstract: Lip print: The science under which lip prints study referred as Cheiloscopy. Establishing a person's identity is a very important process in civil and criminal cases. . Lip prints help in personal identification and criminal investigation is very much important as his evidence would be very much useful in law and justice. Dental identification, fingerprint and DNA comparisons are probably the most common techniques used in this context, allowing fast and secure identification processes. However, since they cannot always be used, sometimes it is necessary to apply different and less known techniques. The pattern of wrinkles on the lips has individual characteristics as fingerprints. Although Lip Print identification may appear in the field literature there is very little science or research to support the theory that Lip Prints are individual, or to support a methodology, for the collection and comparison of Lip Prints, which has become accepted within the forensic community.

Lip prints are unique and do not change during the life of a person. The external surface of lip has numerous elevations and depressions that form a characteristic pattern, referred to as lip prints, lip prints can be obtained at the crime scene from clothing, cups, glasses, cigarettes, windows and doors.

Where identification is concerned, the mucosal area of the lip holds the most interest. This area, also called Klein's zone, is covered with wrinkles and grooves that forms a characteristic pattern the lip print. The importance of Cheiloscopy is linked to the fact that lip prints are unique to one person, except in monozygotic twins. Like fingerprints and palatal rugae, lip grooves are permanent and unchangeable. It is possible to identify lip patterns as early as the sixth week of intra uterine life

The research paper comprises study of 100 female lip prints and 100males lip prints of Marathi community. Prints are divided into 6 types such as branched, rectangular, long vertical, short vertical and diamond and prints of a person studies by dividing lips into four quadrant (A, B, C, and D). This study shows that lip prints are unique to an individual and behold the potential for recognition of the sex of an individual and shows percentage variation of different types of lip prints in male and female lip prints samples. This technique is helpful in sexual dimorphism on the basis of presence of different types of pattern.

Index Terms: Cheiloscopy, Marathi community, Branched pattern

I. INTRODUCTION

Lip prints are normal lines and fissures in the form of wrinkles and grooves present in the zone of transition of human lip, between the inner labial mucosa and outer skin, examination of which is known as Cheiloscopy. This is unique for individuals, as finger prints. Research studies and information regarding the use of lip prints as evidence in personal identification and criminal investigation in dentistry, although age old, are scanty. However, studying in depth and establishing further facts and truth in lip prints will certainly help as useful evidence in forensic identification of person. Lip prints are uniform throughout life and shows presence or absence of person at crime scene.

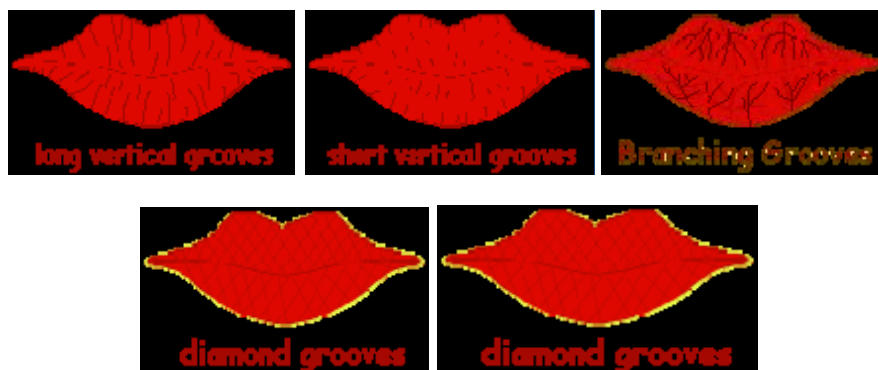
Fischer in 1902 was the first anthropologist to describe the furrows on the red part of the human lips. However, it was only in 1932 that Edmond Locard, one of France's greatest criminologists, recommended the use of lip prints in personal identification and criminalization. In 1950, Synder reported in his book Homicide Investigation that the characteristics of the lips formed by lip grooves are as individually distinctive as the ridge characteristics of finger prints. Suzuki, in 1967, made detailed investigations of the measurement of the lips, the use and color of rouge, and the method for its extraction to obtain useful data for practical forensic application. Later in 1970, Suzuki and Tsuchihashi, conducted a study on 107 Japanese families and named the grooves on labiorum rorum as sulci labiorum and the lip prints consisting of these grooves as ' Figura linearum labiorum rubrorum '. Mc Donnell in 1972 conducted a study on lip prints between two identical twins and reported that two identical twins seemed to be indistinguishable by every other means but their lip prints were different .Cottone, in 1981, reported in his book Outline of Forensic Dentistry, that Cheiloscopy is one of the special techniques used for personal identification. In 1990, Kasprzak conducted a research for period of five years on 1500 persons to elaborate the practical use of Cheiloscopy. Recently, Vahanwala in 2000 conducted a study of lip patterns to promote the importance of Cheiloscopy in forensic science identification.

Suzuki's and Tsuchihashi considered five different types of grooves:

- Type I: Long vertical grooves
- Type I' : Short vertical grooves
- Type II: Branching groove.
- Type III : Diamond grooves
- Type IV : Rectangular grooves

In this study on the basis of Suzuki's and Tsuchihashi classification of lip prints and research on 200 samples (100 male lip prints and 100 female lip prints) lip prints are classified into 6 categories.

- Type 1: Long vertical
- Type 2: Short vertical
- Type 3: Branched
- Type 4: Mixed(quadrant having more than one combination of prints considered as Mixed prints)
- Type 5: Rectangular
- Type 6: Diamond



II. METHODOLOGY

MATERIAL REQUIRED: Glass plate, black powder, and digital camera.

PROCEDURE: The subject should ask to open mouth and press firmly their lips on glass plate, this invisible prints known as latent prints. After taken prints developed it by using black powder used to developed fingerprints, when prints developed then photograph by digital camera. After that prints divided into four quadrant (A, B, C, D) starting clockwise from upper to lower lip of male and female. This same procedure repeats with 100 samples of male and female of Marathi community, and then observed different type of lip prints present at different quadrant. This technique help in sexual dimorphism on basis of presence of different types of lip prints on different quadrant of lips.

III. RESULT

Table: 1(Quadrant wise distribution of different types of lip prints in male)

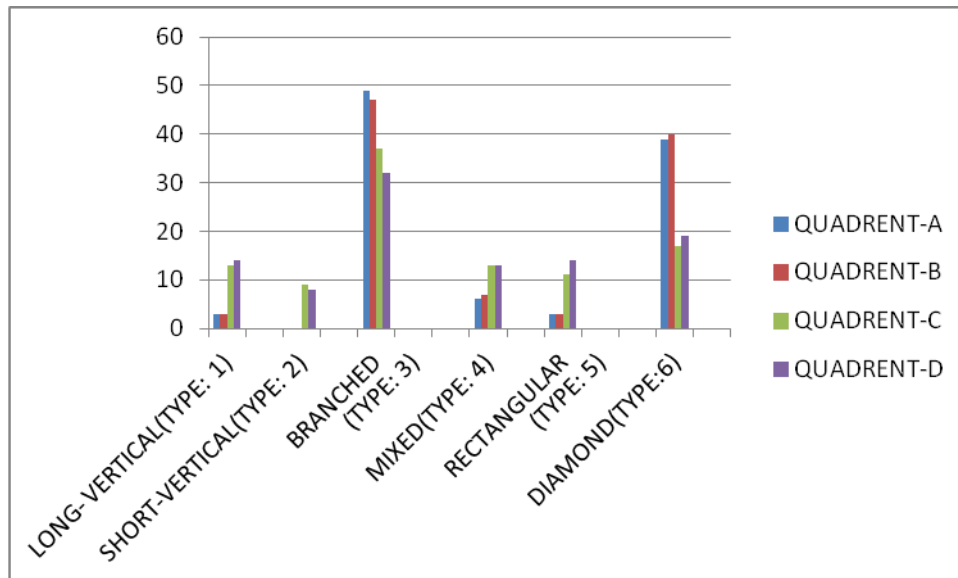
SNO	QUADRENT -A	QUADRENT- B	QUADRENT-C	QUADRENT-D
1	BRANCHED	MIXED	BRANCHED	DIAMOND
2	DIAMOND	DIAMOND	DIAMOND	DIAMOND
3	MIXED	LONG VERTICAL	RECTANGULAR	DIAMOND
4	DIAMOND	BRANCHED	SHORT VERTICAL	SHORT VERTICAL
5	DIAMOND	DIAMOND	MIXED	MIXED
6	DIAMOND	DIAMOND	BRANCHED	BRANCHED
7	DIAMOND	DIAMOND	MIXED	MIXED
8	BRANCHED	BRANCHED	BRANCHED	BRANCHED
9	DIAMOND	DIAMOND	DIAMOND	DIAMOND
10	DIAMOND	DIAMOND	LONG VERTICAL	LONG VERTICAL
11	BRANCHED	BRANCHED	MIXED	MIXED
12	DIAMOND	DIAMOND	DIAMOND	DIAMOND
13	DIAMOND	DIAMOND	MIXED	MIXED
14	LONG VERTICAL	BRANCHED	LONG VERTICLE	BRANCHED
15	MIXED	MIXED	MIXED	DIAMOND

16	BRANCHED	BRANCHED	BRANCHED	BRANCHED
17	DIAMOND	DIAMOND	DIAMOND	DIAMOND
18	BRANCHED	DIAMOND	MIXED	DIAMOND
19	BRANCHED	BRANCHED	LONG VERTICLE	LONG VERTICLE
20	DIAMOND	DIAMOND	DIAMOND	MIXED
21	DIAMOND	DIAMOND	DIAMOND	DIAMOND
22	DIAMOND	DIAMOND	BRANCHED	BRANCHED
23	BRANCHED	BRANCHED	BRANCHED	BRANCHED
24	DIAMOND	MIXED	BRANCHED	RECTANGULAR
25	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
26	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
27	DIAMOND	DIAMOND	MIXED	MIXED
28	MIXED	MIXED	SMALL VERTICAL	SMALL VERTICLE
29	DIAMOND	DIAMOND	DIAMOND	DIAMOND
30	DIAMOND	DIAMOND	DIAMOND	DIAMOND
31	BRANCHED	BRANCHED	BRANCHED	RECTANGULAR
32	BRANCHED	BRANCHED	BRANCHED	MIXED
33	DIAMOND	DIAMOND	BRANCHED	LONG VERTICAL
34	DIAMOND	DIAMOND	BRANCHED	BRANCHED
35	DIAMOND	DIAMOND	DIAMOND	DIAMOND
36	DIAMOND	DIAMOND	DIAMOND	DIAMOND
37	BRANCHED	DIAMOND	BRANCHED	BRANCHED
38	DIAMOND	DIAMOND	DIAMOND	RECTANGULAR
39	DIAMOND	DIAMOND	DIAMOND	RECTANGULAR
40	DIAMOND	DIAMOND	BRANCHED	BRANCHED
41	DIAMOND	DIAMOND	SHORT VERTICLE	SHORT VERTICLE
42	DIAMOND	DIAMOND	MIXED	MIXED
43	DIAMOND	DIAMOND	LONG VERTICLE	LONG VERTICLE
44	BRANCHED	BRANCHED	MIXED	MIXED
45	DIAMOND	DIAMOND	MIXED	MIXED
46	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
47	DIAMOND	DIAMOND	DIAMOND	BRANCHED
48	DIAMOND	DIAMOND	SHORT VERTICLE	SHORT VERTICLE
49	BRANCHED	BRANCHED	BRANCHED	BRANCHED
50	DIAMOND	DIAMOND	RECTANGULAR	RECTANGULAR
51	DIAMOND	DIAMOND	RECTANGULAR	RECTANGULAR
52	DIAMOND	DIAMOND	RECTANGULAR	RECTANGULAR
53	DIAMOND	DIAMOND	DIAMOND	DIAMOND
54	DIAMOND	DIAMOND	BRANCHED	BRANCHED
55	LONG VERTICLE	LONG VERTICLE	BRANCHED	BRANCHED
56	BRANCHED	BRANCHED	BRANCHED	BRANCHED
57	RECTANGULAR	DIAMOND	BRANCHED	BRANCHED
58	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
59	BRANCHED	BRANCHED	LONG VERTICLE	LONG VERTICLE
60	MIXED	MIXED	LONG VERTICLE	LONG VERTICLE
61	BRANCHED	BRANCHED	BRANCHED	BRANCHED
62	BRANCHED	BRANCHED	LONG VERTICLE	LONG VERTICLE
63	BRANCHED	BRANCHED	SHORT VERTICLE	SHORT VERTICLE
64	BRANCHED	BRANCHED	BRANCHED	BRANCHED
65	BRANCHED	BRANCHED	BRANCHED	BRANCHED
66	BRANCHED	BRANCHED	LONG VERTICLE	LONG VERTICLE
67	DIAMOND	DIAMOND	DIAMOND	DIAMOND
68	BRANCHED	BRANCHED	BRANCHED	BRANCHED
69	BRANCHED	BRANCHED	LONG VERTICLE	LONG VERTICLE
70	DIAMOND	DIAMOND	RECTANGULAR	RECTANGULAR
71	BRANCHED	BRANCHED	MIXED	MIXED
72	RECTANGULAR	RECTANGULAR	SHORT VERTICLE	SHORT VERTICLE
73	LONG VERTICLE	LONG VERTICLE	BRANCHED	BRANCHED
74	BRANCHED	BRANCHED	BRANCHED	BRANCHED
75	BRANCHED	BRANCHED	BRANCHED	BRANCHED
76	BRANCHED	BRANCHED	BRANCHED	BRANCHED
77	BRANCHED	BRANCHED	LONG VERTICLE	LONG VERTICLE
78	BRANCHED	BRANCHED	BRANCHED	BRANCHED
79	BRANCHED	BRANCHED	BRANCHED	BRANCHED
80	MIXED	MIXED	SHORT VERTICLE	SHORT VERTICLE

81	BRANCHED	BRANCHED	SHORT VERTICLE	SHORT VERTICLE
82	BRANCHED	BRANCHED	BRANCHED	BRANCHED
83	BRANCHED	BRANCHED	SHORT VERTICLE	SHORT VERTICLE
84	BRANCHED	BRANCHED	LONG VERTICLE	LONG VERTICLE
85	BRANCHED	BRANCHED	BRANCHED	BRANCHED
86	BRANCHED	BRANCHED	MIXED	MIXED
87	DIAMOND	DIAMOND	DIAMOND	DIAMOND
88	MIXED	MIXED	RECTANGULAR	RECTANGULAR
89	BRANCHED	BRANCHED	RECTANGULAR	RECTANGULAR
90	BRANCHED	BRANCHED	BRANCHED	BRANCHED
91	BRANCHED	BRANCHED	BRANCHED	BRANCHED
92	BRANCHED	BRANCHED	BRANCHED	BRANCHED
93	BRANCHED	BRANCHED	BRANCHED	LONG VERTICLE
94	BRANCHED	BRANCHED	MIXED	MIXED
95	DIAMOND	DIAMOND	DIAMOND	DIAMOND
96	BRANCHED	BRANCHED	LONG VERTICLE	LONG VERTICLE
97	BRANCHED	BRANCHED	BRANCHED	BRANCHED
98	BRANCHED	BRANCHED	RECTANGULAR	RECTANGULAR
99	BRANCHED	BRANCHED	RECTANGULAR	RECTANGULAR
100	BRANCHED	BRANCHED	BRANCHED	BRANCHED

Table: 2(different type of lip prints present in different quadrents in male))

SNO	QUADRENT-A	QUADRENT-B	QUADRENT-C	QUADRENT-D
LONG-VERTICAL(TYPE: 1)	3	3	13	14
SHORT-VERTICAL(TYPE: 2)	0	0	9	8
BRANCHED (TYPE: 3)	49	47	37	32
MIXED(TYPE: 4)	6	7	13	13
RECTANGULAR (TYPE: 5)	3	3	11	14
DIAMOND(TYPE:6)	39	40	17	19



Bar diagram of different type of lip patterns in male quadrants wise

Table: 3 (Quadrant wise distribution of different types of lip prints in female)

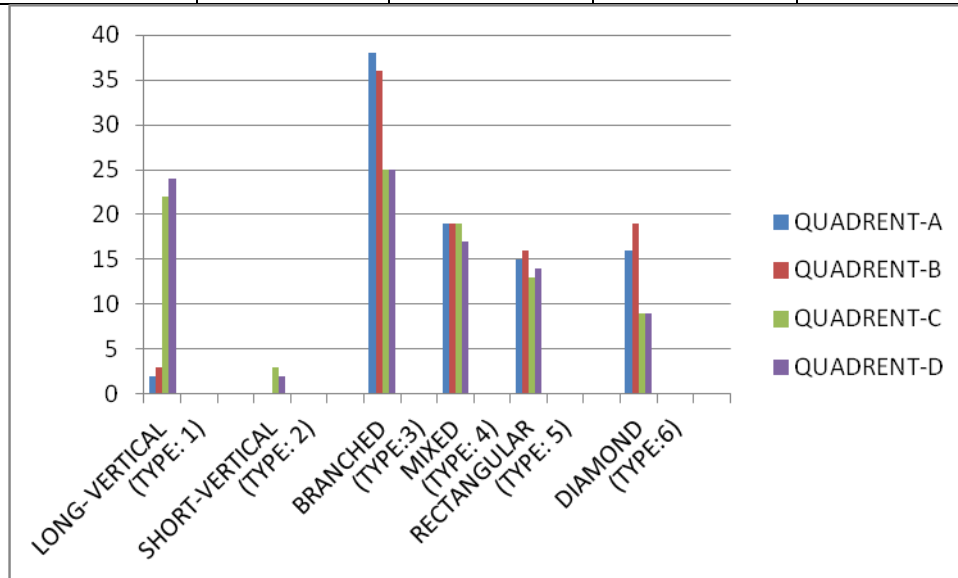
SNO	QUADRENT-A	QUADRENT-B	QUADRENT-C	QUADRENT-D
1	MIXED	BRANCHED	BRANCHED	BRANCHED
2	DIAMOND	DIAMOND	MIXED	RECTANGULAR
3	RECTANGULAR	RECTANGULAR	LONG VERTICAL	LONG VERTICAL
4	DIAMOND	DIAMOND	DIAMOND	DIAMOND
5	MIXED	MIXED	LONG VERTICAL	LONG VERTICAL
6	MIXED	LONG VERTICAL	LONG VERTICAL	LONG VERTICAL
7	MIXED	MIXED	LONG VERTICAL	LONG VERTICAL
8	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
9	BRANCHED	BRANCHED	MIXED	MIXED
10	BRANCHED	MIXED	MIXED	MIXED
11	DIAMOND	DIAMOND	MIXED	MIXED
12	BRANCHED	BRANCHED	RECTANGULAR	RECTANGULAR
13	DIAMOND	DIAMOND	DIAMOND	DIAMOND
14	BRANCHED	BRANCHED	BRANCHED	LONG VERTICLE
15	DIAMOND	DIAMOND	DIAMOND	DIAMOND
16	LONG VERTICAL	LONG VERTICAL	LONG VERTICAL	LONG VERTICAL
17	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
18	MIXED	DIAMOND	MIXED	MIXED
19	RECTANGULAR	RECTANGULAR	LONG VERTICAL	MIXED
20	BRANCHED	BRANCHED	RECTANGULAR	RECTANGULAR
21	BRANCHED	BRANCHED	MIXED	MIXED
22	BRANCHED	BRANCHED	BRANCHED	BRANCHED
23	DIAMOND	DIAMOND	DIAMOND	DIAMOND
24	MIXED	MIXED	RECTANGULAR	RECTANGULAR
25	RECTANGULAR	RECTANGULAR	LONG VERTICAL	LONG VERTICAL
26	DIAMOND	DIAMOND	LONG VERTICAL	LONG VERTICAL
27	DIAMOND	DIAMOND	MIXED	MIXED
28	DIAMOND	DIAMOND	DIAMOND	DIAMOND
29	DIAMOND	DIAMOND	MIXED	MIXED
30	RECTANGULAR	RECTANGULAR	LONG VERTICAL	LONG VERTICAL
31	BRANCHED	BRANCHED	BRANCHED	BRANCHED
32	MIXED	MIXED	BRANCHED	BRANCHED
33	MIXED	MIXED	MIXED	MIXED
34	DIAMOND	DIAMOND	DIAMOND	DIAMOND
35	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
36	MIXED	MIXED	MIXED	MIXED
37	BRANCHED	BRANCHED	SHORT VERTICAL	SHORT VERTICAL
38	MIXED	MIXED	MIXED	MIXED
39	MIXED	MIXED	RECTANGULAR	RECTANGULAR
40	BRANCHED	MIXED	BRANCHED	MIXED
41	BRANCHED	BRANCHED	BRANCHED	BRANCHED

42	BRANCHED	BRANCHED	BRANCHED	BRANCHED
43	BRANCHED	BRANCHED	BRANCHED	BRANCHED
44	MIXED	MIXED	MIXED	MIXED
45	BRANCHED	BRANCHED	MIXED	MIXED
46	BRANCHED	BRANCHED	BRANCHED	BRANCHED
47	BRANCHED	BRANCHED	BRANCHED	BRANCHED
48	MIXED	MIXED	BRANCHED	BRANCHED
49	DIAMOND	DIAMOND	SHORT VERTICAL	SHORT VERTICAL
50	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
51	BRANCHED	BRANCHED	BRANCHED	BRANCHED
52	BRANCHED	BRANCHED	BRANCHED	BRANCHED
53	MIXED	MIXED	MIXED	MIXED
54	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
55	BRANCHED	BRANCHED	BRANCHED	BRANCHED
56	DIAMOND	DIAMOND	DIAMOND	DIAMOND
57	DIAMOND	DIAMOND	RECTANGULAR	RECTANGULAR
58	BRANCHED	BRANCHED	MIXED	MIXED
59	BRANCHED	BRANCHED	SHORT VERTICAL	SHORT VERTICAL
60	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
61	DIAMOND	DIAMOND	BRANCHED	BRANCHED
62	BRANCHED	BRANCHED	BRANCHED	BRANCHED
63	RECTANGULAR	RECTANGULAR	LONG VERTICAL	LONG VERTICAL
64	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
65	BRANCHED	BRANCHED	MIXED	BRANCHED
66	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
67	MIXED	MIXED	RECTANGULAR	RECTANGULAR
68	BRANCHED	BRANCHED	RECTANGULAR	RECTANGULAR
69	BRANCHED	BRANCHED	SHORT VERTICAL	SHORT VERTICAL
70	RECTANGULAR	RECTANGULAR	BRANCHED	BRANCHED
71	MIXED	MIXED	LONG VERTICAL	LONG VERTICAL
72	RECTANGULAR	RECTANGULAR	LONG VERTICAL	LONG VERTICAL
73	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
74	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
75	DIAMOND	DIAMOND	LONG VERTICAL	LONG VERTICAL
76	DIAMOND	DIAMOND	DIAMOND	DIAMOND
77	RECTANGULAR	RECTANGULAR	BRANCHED	BRANCHED
78	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
79	MIXED	MIXED	DIAMOND	DIAMOND
80	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
81	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
82	LONG VERTICAL	LONG VERTICAL	LONG VERTICAL	LONG VERTICAL
83	BRANCHED	BRANCHED	BRANCHED	BRANCHED
84	RECTANGULAR	RECTANGULAR	BRANCHED	BRANCHED
85	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
86	BRANCHED	BRANCHED	BRANCHED	BRANCHED
87	BRANCHED	BRANCHED	BRANCHED	BRANCHED
89	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
90	BRANCHED	BRANCHED	SHORT VERTICAL	SHORT VERTICAL
91	MIXED	MIXED	MIXED	MIXED
92	BRANCHED	BRANCHED	BRANCHED	BRANCHED
93	DIAMOND	DIAMOND	DIAMOND	DIAMOND
94	BRANCHED	BRANCHED	SHORT VERTICAL	SHORT VERTICAL
95	BRANCHED	BRANCHED	BRANCHED	BRANCHED
96	MIXED	MIXED	MIXED	MIXED
97	BRANCHED	BRANCHED	LONG VERTICAL	LONG VERTICAL
98	MIXED	MIXED	MIXED	MIXED
99	RECTANGULAR	RECTANGULAR	RECTANGULAR	RECTANGULAR
100	BRANCHED	BRANCHED	BRANCHED	BRANCHED

Table -4(different type of lip prints present in different quadrants in female)

SNO	QUADRENT-A	QUADRENT-B	QUADRENT-C	QUADRENT-D
LONG- VERTICAL (TYPE: 1)	2	3	22	24

SHORT-VERTICAL (TYPE: 2)	0	0	3	2
BRANCHED (TYPE:3)	38	36	25	25
MIXED (TYPE: 4)	19	19	19	17
RECTANGULAR (TYPE: 5)	15	16	13	14
DIAMOND (TYPE:6)	16	19	9	9



Bar diagram of female lip prints quadrant wise.

IV. DISCUSSION

In present study of lip prints of Marathi community shows that type 3 (branched) pattern is frequently present in both sexes in all quadrants .In female 8.25% of long vertical 4.25% of short vertical,41.25% of branched, 9.75% of mixed, 7.25% of rectangular and 28.75% of diamond in all four quadrants.

In female 12.75% of long vertical, 1.25% of short vertical, 31% of branched, 18.5% of mixed, 14.5% of rectangular, 13.25% of diamond in all four quadrants.

V. CONCLUSION

Lip print identification is generally acceptable within the forensic science community as a means of positive identification because it appears in the literature the importance of Cheiloscopy is linked to the fact that lip prints are unique to one person, except in monozygotic twins. Like fingerprints and palatal rugae, lip grooves are permanent and unchangeable there is a need for Lip prints identification to be acceptable in the court as scientifically based evidence. This research involves the study of 200 lip prints in Marathi community (100 lip prints of male and 100 of female shows branched (type 3) pattern present most in both the sexes.

REFERENCES

1. Verghese J.Dr vrghese,Somasekar Dr Umesh, R.Babu, A study on lip prints among the people of Kerala, *J.I.A.F.M*, **32(1)**
2. PrabhuV.Rachana, Dinkar D.Ajit, Prabhu Dinesh Vishnudas, Collection of lip prints as a forensic evidence at the crime scene – an insight.
3. Aggrawal Dr. Anil, Importance of lip prints, *I.J.F.T*, **VOL(II)(2004)**
4. Reddy Krishna vamsi , An overview in forensic dentistry,*J.A.D.R*,**VOL(II)(2011)**
5. Nandy A. Principles of Forensic Medicine. 2nd edition. Calcutta: Central, 100-101(2003)

AUTHORS

First Author – Neeti Kapoor, Assistant Professor, Institute of Forensic Science, RTM Nagpur University, Nagpur MH, INDIA

Second Author – Prakash Tiwari, Department of Criminology and Forensic Science, Dr. Hari Singh Gour University, Sagar, MP INDIA