

PATTERNS OF LIP PRINTS IN THAIS

Bunpot Goodhour,^{1*} Suda Riengrojpitak,² Montip Tiensuwan,³ Wiwan Suwansumrit⁴

¹ M.Sc. Programme in Forensic Science, Faculty of Science, Mahidol University, Bangkok 10400, Thailand

² Department of Pathobiology, Faculty of Science, Mahidol University, Bangkok 10400, Thailand

³ Department of Mathematics, Faculty of Science, Mahidol University, Bangkok 10400, Thailand

⁴ Central Institute of Forensic Science, Ministry of Justice, Nonthaburi 11120, Thailand

*e-mail: scsrr@mahodol.ac.th

Abstract: Lip print pattern has been studied and used as means of identification in criminal and civil issues. The objectives of this study were to investigate the lip print patterns, and identify the most common pattern in Thais. It is the first lip pattern study done on Thai individuals. A total of 260 male and female, 130 each, aged between 7 to 75 years from Bangkok, Nonthaburi, Saraburi, Chachoengsao and Khonkaen provinces were studied.

A pink moisture lipstick was used to collect the lip impressions of the subjects. Both upper and lower lips prints were divided into equally eight topographic areas. Characteristics patterns of each area was examined and statistically analyzed. Pattern G (reticular pattern) is the most predominant in Thais, followed by patterns E (Complete branched), A (complete vertical), B (incomplete vertical), C (complete bifurcated), J (horizontal with other forms), D (incomplete bifurcated), F (incomplete branched), and H (X or comma form). Patterns F and H were not seen in females; Pattern I was not found in both sexes. No difference between male and female in term of pattern frequency. The upper lip, the highest frequency was G followed by E and low in others. The lower lip, E was the highest frequency in both left and right corners, followed by G; while A, B, G were predominant in lower middle areas. Although the patterns were similar but dissimilar in site and angle was found in deep details. No identical lip print pattern was examined in the sampling subjects. Clear and actual sizes of lip prints were established and a good evidentiary value in forensic comparative science.

Introduction: In forensic investigation, many evidences are important for human identification such as fingerprint, foot print, shoe print, and DNA analysis. The importance of Cheiloscopy is linked to the fact that lip prints are unique to one person even in monozygotic twins.^{2,4} Lips prints can be used to characterize human being the same as fingerprints.³ Lip print pattern is an anatomical character of the human lips. Snyder (1970) first described lip prints in 1950 and stated that “wrinkles and cracks on the lips might identify persons”.

Methodology: The bare lips with measuring scale were photographed using high resolution digital camera. A pink moisture lipstick was applied on the cleaned and dried lips. A plastic cylinder wrapped with white paper was used to collect lips print by rolling from right to left with gently force in a relax position. Photograph was taken on every lip sample. The lip prints on the paper were covered with cellophane tape for permanent record and divided into eight equally topographic areas (Figure 1), examined by magnifying lens. A modification of the Renaud’s classification (1973) was used to classify the patterns of ridges or grooves according to Domiaty et al. (2010). Percent frequency of each pattern in each area was analyzed by statistical software. The Bayes’ theorem was used to calculate the Bayes’ probability and favored odds of the lip pattern density and characteristics. The data were

analyzed using a statistical package SPSS for Windows version 18.0. Statistical significance was considered at, p -value < 0.05 .

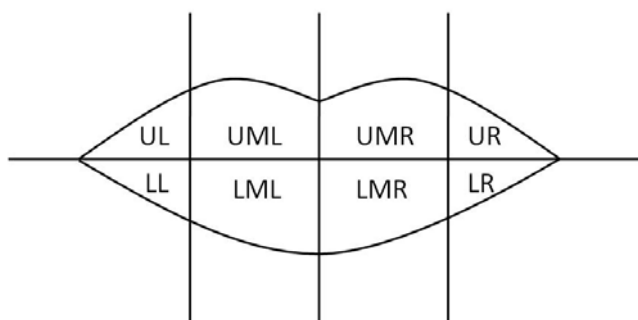


Figure 1. Eight equally topographic areas of lip print

Results, Discussion and Conclusion: In the present study, nine patterns of lip print according to Domiaty et al. (2010) (Figure 2), except pattern I, were observed in 130 males and 130 females. Percent frequency of each lip pattern is similar in both genders. The highest percentage was found in pattern G in both male (38.68%) and female (41.49%), followed by E, A, B, C, J, D, F. Patterns F and H could not be found in female but low percentage in male. Pattern I could not be found in both genders (Table 1).

It was reported that nine types of grooves were recorded in Saudi lips. Type J was the highest recorded followed by C, E, G, A, D, H and B. Pattern I was the least recorded one and appeared only in Saudi females; dissimilar lip-print patterns were detected among different individuals of families.¹ Our finding showing that no two lip prints are found the same (identical) in deeply detail which is similar to those studied by Domiaty et al (2010). They also found that non-identical lip-print patterns were recorded in identical twins. About ten percent showed one type of grooves in all areas of the lips, but two or more types of grooves were commonly seen in different areas of the print.¹

The percent frequency of each lip pattern in each area of male and female was quite similar (Figure 3). The high frequency was found in LMR and LML in both male and female. Patterns G and E were found in all areas of both upper and lower lips, but in different manner.

On upper lip of both genders, pattern G was the highest percent frequency followed by E (G was approximately twice of E), but different in minor patterns. On lower lip of both sexes, nine patterns were found in LML and LMR; the predominant patterns was A followed by B, G and E. In LL and LR, E was the predominant pattern followed by G. Therefore, the diversity of various patterns in these areas was established. This is useful for human identification. Pattern E could be classified into 3 groups: the highest (LL and LR), the medium (UL, UML, UMR and UR), and the lowest (LML and LMR). Pattern G showed two groups of probability density, first, in all areas of upper lip and second, the lower lip areas. Probability of patterns F was very low in male and could not be found in female. Probability of pattern H was very low in LMR, LML, LR and UMR, and could not be found in others. Pattern J was present in all areas of both upper and lower lips, but in low frequency. Domiaty (2010) reported 72.67% of prints showed the same groove pattern in the upper right and upper left areas, while 75.36% showed the same groove pattern in the lower right and lower left areas. They described the lip-print patterns of both genders at Almadinah

Almonawarah province and confirmed that the lip-print pattern is unique for each individual even in twins and family relatives.

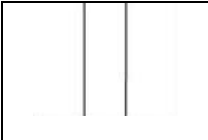
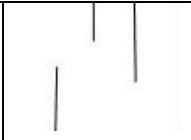
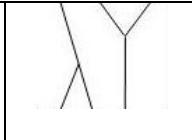
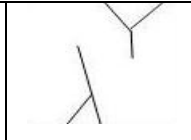
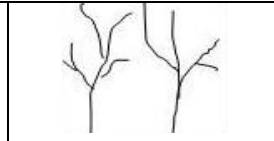
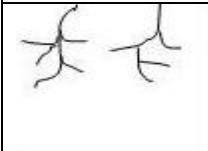
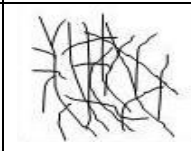

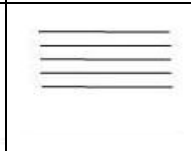
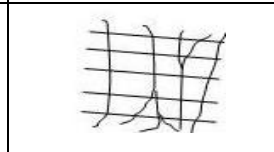
				
A Complete vertical	B Incomplete vertical	C Complete bifurcated	D Incomplete bifurcated	E Complete Branched
				
F Incomplete branched	G Reticular pattern	H X or comma form	I horizontal	J Horizontal with other forms (vertical, bifurcate or branching)

Figure 2. Ten lip print pattern types (Domiaty et al. 2010).

Table 1. Distribution of lip print pattern in male and female

Lip Patterns	Male		Female	
	Frequency	%	Frequency	%
A (Complete vertical)	166	12.16	175	13.40
B (Incomplete vertical)	137	10.04	125	9.57
C (Complete bifurcated)	87	6.37	62	4.75
D (Incomplete bifurcated)	15	1.10	8	0.61
E (Complete branched)	372	27.25	346	26.49
F (Incomplete branched)	6	0.44	0	0
G (Reticular pattern)	528	38.68	543	41.49
H (X or comma form)	6	0.44	0	0
I (Horizontal)	0	0	0	0
J [Horizontal with other forms (vertical, bifurcate or branching)]	48	3.52	47	3.60
Total	1,365	100	1,306	100

Note: More than one pattern could be found in one area.

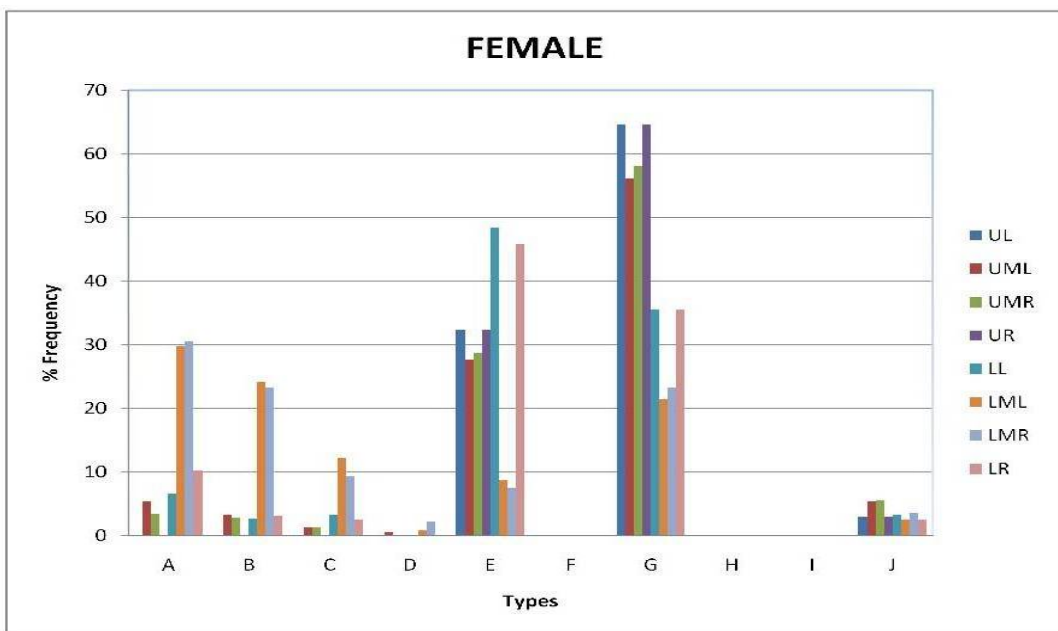
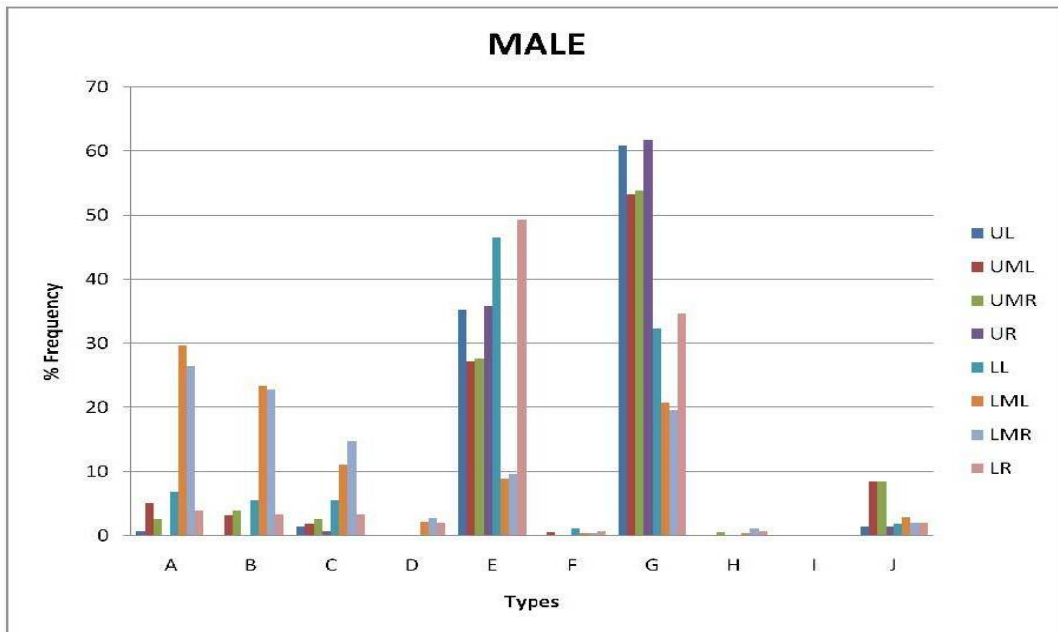


Figure 3. Percent frequency of lip print pattern in each area of male and female

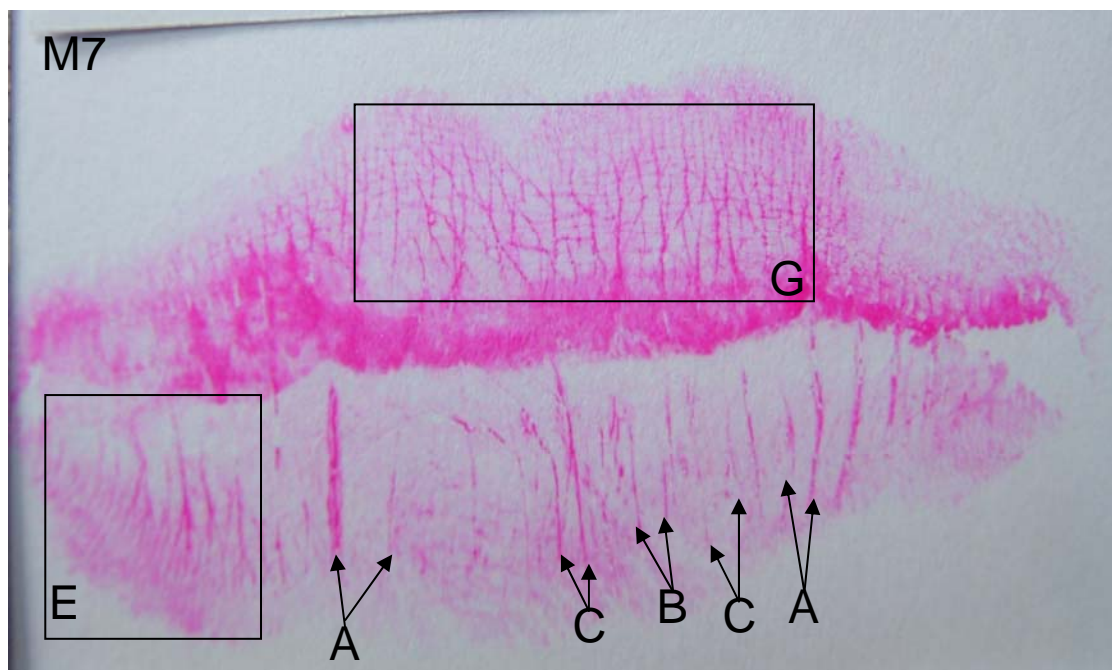


Figure 4. A lip print showing patterns A (Complete vertical), B (Incomplete vertical), C (Complete bifurcated), G (Reticular pattern) and E (Complete branched).

References:

1. Domiaty, M.A.E., Al-gaidi, S.A., Elayat, A.A., Safwat, M.D.E. *Forensic Science International* **2010**, *200*, 179c1- 179c9.
2. Sivapathasundharam, B., Prakash,P.A., Sivakumar, G. *Ind. J. Dent. Res.* **2001**,*12 (4)*, 234-237.
3. Snyder, LM. *Can. Soc. Forensic Sci.* **1970**, *4*, 154-158.
4. Tsuchihashi, Y. *Forensic Science* **1974**, *3*, 233-248.

Acknowledgements: The authors would like to thank Australian Federal Police (AFP) and Australian Embassy (Bangkok) for the financial support to Pol. Lt. Col. Bunpot Goodhour. Special thank to the Office of Police Forensic Science and Saraburee Forensic Police Division for their supports.

Keyword: Lip print pattern, Thai lip print, Cheiloscopy