

## Investigating the Morphological Patterns of Lip Prints and Their Effectiveness in Individualization and Gender Determination in Pakistani Population

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**Abstract :** Lip print analysis (Cheiloscopy) is the new emerging technique that might be the guardian angel in establishing the personal identity. Cheiloscopy is basically the study of elevations and depressions present on the external surface of the lips. In our study, 600 lip prints samples were taken (300 males and 300 females). Lip prints of each individual were divided into four quadrants and the upper middle portion. For general classification, middle part of the lower lip almost 10 mm wide would be taken into consideration. After analysis of lip-prints, our results show that lip prints are the unique and permanent character of every individual. No two lip print was matched with each other even of the identical twins. Our study reveals that there is equal distribution of lip print patterns among all the four quadrants of lips and the upper middle portion; these distributions were statistically analyzed by applying chi-square test which shows the significant results. In general classification, 5 lip print types/patterns were studied, Type 1 (Vertical lines), Type 2 (Branched pattern), Type 3 (Intersected pattern), Type 4 (Reticular pattern) and Type 5 (Undetermined). Type 1 and Type 2 were found to be the most frequent patterns in female population, while Type 3 and Type 4 most commonly found in male population. These results were also analyzed by applying Chi-square test, and the results show significance statistically. Thus, establishing sex determination on the basis of lip print types among the gender. Type 5 was the least common pattern among genders.

**Keywords :** cheiloscopy, distribution, quadrants, sex determination

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