B171 Unusual Fingerprint Patterns in a North Indian Population—Implications in Forensic Casework and Fingerprint Research

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Learning Overview: After attending this presentation, attendees will understand the usefulness, importance, variability, and implications of the unusual fingerprint patterns in forensic casework and fingerprint research, especially while classifying the fingerprint patterns into defined categories.

Impact on the Forensic Science Community: This presentation will impact the forensic science community regarding new information on unusual fingerprint patterns. Moreover, this presentation is also expected to further help forensic scientists and fingerprint researchers acquire profound understanding of the fingerprint pattern in the identification process and in making population standards pertaining to different types of fingerprints in various population groups.

Fingerprinting remains one of the most popular methods of identification since the denouement of 19th century. Fingerprints serve as a powerful and most widely used characteristic tool in various issues pertaining to identification. The science of fingerprints has been employed for business transactions in Babylon up to the present day biometric, security system, and fingerprint sensing for locking of smart phones to secure the privacy of the user. The presence of definitive patterns and a large number of combinations of their occurrences form the basis of its use in forensics for identification purposes. The tenacity of fingerprint evidence for the identification of criminals has been well documented, but none of the research work focused on unusual fingerprints; therefore, the present study attempted to define such rarely encountered fingerprints in a population. The objective of the present study was to explore the unusual pattern types on the finger balls and their comparison with the commonly occurring and classifiable pattern types. Further, this presentation discusses the occurrence of unusual fingerprints in both the sexes with reference to the finger digits.

The research was conducted on 512 participants aged between 18 and 35 years from two ethnic groups residing in Districts Solan and Shimla in Himachal Pradesh State of North India. A total of 5,120 fingerprints from each digit of the 512 individuals were obtained. The fingerprints were analyzed for the pattern types based on Henry's classification. The patterns that did not fall in the prescribed category as per the definition of the finger pattern types were identified as unusual fingerprints.

A total of 11 unusual fingerprints were reported in both the sexes and two different ethnic groups studied, thus accounting for ~0.21% of the unusual fingerprints. These fingerprints were thoroughly analyzed and compared with the general pattern types according to Henry's classification. Furthermore, this study attempted to define these unusual fingerprints to formulate a category that may aid in the individualization process. The suggestive definition and naming of these new fingerprint patterns stands as a central pocket whorl (two patterns), a single spiral whorl enclosing mesh, a central pocket loop with a diminutive loop, and a lateral pocket loop with triradii (left) in the center. The proposed new nomenclature of these unusual fingerprints is expected to assist the forensic scientists and fingerprint examiners in better understanding and labeling of similar patterns in forensic cases.

Criminalistics, Unusual Fingerprints, Fingerprint ID and Research