



E13 Footprint Analysis: Data From North India Study Suggests New Features for Individualization and Biologic Profiling

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Learning Overview: After attending this presentation, attendees will have learned the usefulness of the individualistic and unique characteristics of footprints, the foundations and principles of footprint analysis, and how to apply this science to the evaluation of footprints associated with crimes, conduct research in this area, and apply this knowledge to other specialties.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by explaining the methods of analysis of footprints in terms of unique and individualistic characteristics that emerged from research on a large North Indian sample. This information will provide forensic scientists with a thorough understanding of new features and characteristics to consider when analyzing footprints in criminal matters, creating biologic profiles, while emphasizing the limitations of such analysis, and avenues to apply this knowledge and its methodologies to other scientific specialties and pursuits.

The modern analysis of footprints in the forensic context began in the 1970s and has made striking and noteworthy advances—progressing from anecdotal reports to reliable, substantial, scientific methodologies. These principles of footprint analysis are extremely valuable in identifying individuals associated with criminal activity. In addition, the principles have applications that may be applied to medicine, anthropology, engineering, biology, and other sciences.

This presentation introduces the findings and practical applications of the research conducted on an adult Gujjar population inhabiting the Sub-Himalayan region of northern India and on the students of a university in northern India as part of a significant investigation funded by the University Grants Commission of New Delhi. This research analyzed adult footprints with the objective of determining new features and characteristics that could be applied in the identification of individuals and in creating biologic profiles.

The research was conducted on a group of 700 adults (500 males and 200 females), ranging in age from 18 to 30 years. This study analyzed important features of the subjects' footprints, including some lesser-considered characteristics that had not been previously examined in a comprehensive manner. These features included biomechanical, morphological, and dermatological aspects, including humps in the toe-line, phalange marks, pits, crease marks, and cracks.

This study also evaluated anthropometric measures, such as relative lengths of the toes, which provide information on their morphology. These findings resulted in the development of a systematic method of categorizing footprints. The research showed that footprints may be classified on the basis of the relative morphological lengths of the first, second, and third toes. These findings suggest that partial footprints can provide valuable information, particularly in forensic matters where a partial footprint at a crime scene may prove adequate to be linked (or unlinked) to a suspect or a person of interest.

Forensic Podiatry, Individualistic Characteristics, Biologic Profiling