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POSTER PRESENTATION – P23

FOOTPRINT MORPHOMETRY IN STATURE ESTIMATION OF SUBADULTS: ANTHROPOLOGICAL AND FORENSIC IMPLICATIONS

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Background: Footprint morphometry offers a promising approach for biological profiling in forensic anthropology, in situations where podiatric traces are more likely to be recovered than skeletal or genetic evidence. Studies exist on young adults and older populations till date, but research specifically on juvenile (or subadult) populations remains limited.

Objectives: This study is a preliminary attempt to investigate how static footprint dimensions relate to stature in Slovak subadults and evaluates their applicability for stature estimation models that can be relevant to human growth research in anthropological domains and Central European forensic caseworks.

Subjects and methods: A cross-sectional sample of 110 healthy Slovak adolescents (58 females, 52 males; 10–18 years) was collected using a recently validated non-colouring cream method to obtain bilateral static footprints and stature. Seven footprint variables were measured (toe lengths FPT1–FPT5, ball breadth FPBB, heel breadth FPHB).

Results: All footprint variables showed significant positive correlations with stature ($r=0.366–0.894$, $p<0.001$), with toe lengths exhibiting consistently stronger associations than breadth measurements in both sexes. Linear regression models yielded high coefficients of determination, particularly among males (R^2 up to 0.906), whereas females showed slightly lower but robust predictive power (R^2 up to 0.782). Multiple regression models that combined length and breadth variables with age further enhanced accuracy, reaching $R^2=0.910$ in males and $R^2=0.809$ in females.

Conclusion: The study contributes to a baseline or preliminary data for a Central European subadult reference, underscoring the anthropological importance of growth-related variations in foot form and the forensic value of footprint evidence in the identification of juvenile individuals encountered in crime scenes and mass disaster scenarios.

Keywords: Forensic anthropology; Biological estimation; Footprints; Stature prediction; Subadults.

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