Title: Canine crown sexual dimorphism in a sample of the modern Croatian population

Authors: JELENA DUMANCIC[1], G. RICHARD SCOTT[2], SANDRA ANIC MILOSEVIC[3], NATASA MEDANCIC[4], HRVOJE BRKIC[1]

Affiliations: [1]Department of Dental Anthropology, School of Dental Medicine, University of Zagreb, Zagreb, Croatia, [2]Department of Anthropology, University of Nevada, Reno, NV USA, [3]Department of Orthodontics, School of Dental Medicine, University of Zagreb, Zagreb, Croatia, [4]Private dental practice, Zagreb, Croatia

Sex assessment is a key part of forensic analysis to establish the identity of unknown deceased individuals. While skeletal sexual characteristics develop during puberty, development of permanent teeth takes place early in childhood and the influence of sex chromosomes is expressed in the sexual dimorphism of tooth crowns and roots. Previous studies have shown that canines are the most dimorphic teeth, but population-specific data are necessary for forensic methods. This study explores sex dimorphism in canine crown dimensions and morphology in a contemporary Croatian population. Hypothesis: both canine crown dimensions and morphology can be used for sex estimation.

The material consisted of 302 dental casts (147 females, 155 males) of orthodontic patients and dental students (11-25 years). Distal accessory ridge (DAR) of the upper and lower canines was evaluated using the Arizona State University Dental Anthropology System. Mesiodistal (MD) and buccolingual (BL) crown dimensions were measured on 120 casts.

Sex differences in MD and BL dimensions were significant ($p<0.05$, Student t-test) for all the canines (upper and lower, left and right) while in DAR only for lower canines ($p<0.000001$, Kruskal-Wallis tests). When all variables were put in model, backward stepwise discriminant function analysis isolated lower canine DAR and lower left canine MD as the two independent variables differentiating sex with an accuracy of 73.5%.

This study shows that both canine crown morphology and dimensions are useful for sex determination, especially for lower canines. These methods can be applied in children as lower canines erupt at about 9 years of age.

Keywords: Forensic Anthropology; Human; Dental Anthropology; Variation and Variability

Funding Citation: This research was funded by the Croatian Science Foundation within the project: IP-2020–02-9423 — Analysis of teeth in forensic and archaeological research.