

A16 Metric and Non-Metric Ancestry Evaluation Analysis of the Craniofacial Region in Greek-Cypriots: A Pilot Study

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Learning Overview: After attending this presentation, attendees will have a better understanding of the need to create population-based standards for less-studied regions, such as Cyprus and the wider eastern Mediterranean. This study combines different ancestry evaluation techniques developed around the world in order to determine an ancestry profile for Greek-Cypriots. This study also discusses the value of the Greek-Cypriot population as a platform for the development of human identification standards that could server the rest of the eastern Mediterranean region.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by offering a new composite method in ancestry evaluation that could serve as a population-based standard for human identification for Greek-Cypriots. This research utilizes a combination of metric analysis and non-metric observations to determine the skeletal “face” of Greek-Cypriots. This pilot study evaluates the relationship between different bones of the facial skeleton and their bordering landmarks. Thus, this study offers a unique insight of how different methods could work together to the development of a single ancestry evaluation approach for a newly studied population. Furthermore, the genetic makeup of Greek-Cypriots resembles that of its immediate neighbors; thus the results of this study, with little or no modification, could be applicable in establishing positive identification for unidentified remains retrieved in those areas.

Ancestry is a topic less studied in Europe and the Mediterranean region than in the United States. Little effort has been made to define the morphological parameters of the different populations that constitute the continent. The underlying hypothesis that we are all European-White in Europe has played a major role in ancestry being a less common research subject. However, open borders within the Eurozone and immigrant influx from war-afflicted countries have increased the need for ancestry standards to be developed as Europe and the Mediterranean are now characterized by mixed and admixed communities.

Combining both metrics and non-metric traits, the aim of this study is to create an objective methodological framework for analysis for this particular region of the cranium. The objective of this study is to define the craniofacial character of Greek-Cypriots and establish ancestry-related parameters. Methods focusing on more area-specific regions of the cranium can further aid in the evaluation of ancestry of fragmentary remains. In a pilot study of contemporary skeletons from the Cyprus Reference Research Collection (CRRC), focus was placed on the identification of macromorphoscopic and metric characteristics of the zygomatic bone in relation to the maxilla, orbits, and nasals.

A total of 50 crania were assessed using a total of 17 measurements, 5 of which aimed at recording size differences between males and females. The presence, frequency, and expression of ten non-metric traits from the zygomatic region was assessed macroscopically. While metrics show that a degree of sexual dimorphism in the overall size of this region of the facial skeleton is present, in some instances the overlap between male and female ranges was significant. Furthermore, when compared to other population groups, the mean average of bizygomatic breadth in Greek-Cypriots show distinct ancestral character specific to this population. With regard to non-metric observations, in many instances zygomatic traits classified within the low expression categories. However, some traits proved to be population specific. For example, a projecting zygoma was a predominant male (64%) and female (80%) characteristic, with an overall 72% incidence value; while the malar tubercle was greatly absent in both sexes. Additionally, the shape of the zygomatico-temporal suture was assessed, and a potentially a new non-metric trait was discovered during this research project.

In conclusion, the results of this study suggest that the combination of both metric and non-metric analysis is a useful tool in ancestry evaluation. The two approaches are complementary to each other and provide an objective framework for the determination of ancestry in skeletal remains but also reflect on the underlying similarities and differences between the sexes.

Ancestry Evaluation, Macromorphoscopic, Sexual Dimorphism