



Physical Anthropology Section - 2012

H103 Unveiling Ancestry in Colombia through Morphometric Analysis

*Maria A. Lopez, BA**, National Institute of Legal Medicine and Forensic, Calle 24 #5A-61, Tunja, COLOMBIA; *Diego A. Casallas*, Attorney General's Office, Diag 22B # 52-01, Edificio L, Piso 5, Bogota, COLOMBIA; *Daniel Castellanos, MS*, National Institute of Legal Medicine and Forensic, Calle 4B #36-01, Cali, COLOMBIA; *Francia V. Soto, BA*, Prosecutor General's Office, Fiscalía General de la Nación, Cra. 19 #24-61, Bucaramanga, COLOMBIA; and *Jonathan D. Bethard, MA*, Boston University, School of Medicine, Boston, MA 02118

After attending this presentation, attendees will understand the complexity of accessing ancestry in Colombia given its heterogeneous population history. In addition, attendees will learn that recent analyzes of a documented modern Colombian skeletal collection have initiated a quantitative approach to understanding variation in Colombia.

This presentation will impact the forensic science community by presenting results on the first geometric morphometric ancestry study in Colombia. In addition, this presentation will contribute to recent research that has attempted to quantify population variation in Latin America.

Colombia is a multiethnic and multicultural country where various human groups of European, African, and Indigenous ancestry have intermixed and therefore shared the social, cultural, and biological characteristics of their place of origin. The concept of ancestry in Colombia is more complicated than in many other countries as a result of the particular demography, history, anthropology, and genetics of its inhabitants. Genetic research has found marked mtDNA differences among contemporary Colombians, indicating numerous geographic haplotypes, all of which have contributed to the regional division of the country's population.¹ To date, these differences have not yet been compared to the morphological and morphometric cranial features of the same populations.

In forensic anthropology, ancestry estimations have traditionally and generally been done on the basis of physical anthropological principles, such as craniofacial morphology. This morphology has been used to create categories of different groups of human beings, showing that there are perceptible metric and morphological differences between populations. Traditionally-used categories (European, African, and Asian) may correspond to the social categories used for ancestry in Colombia (Indigenous, African-Colombian, and Mestizo). However, ancestry analysis in the forensic context has been based primarily on foreign population studies, which have recently sparked discussions on the credibility of these studies in Colombia.

This project is the first geometric morphometric characterization to study ancestry in Colombia. Based on Buikstra and Ubelaker, the craniometric landmarks of 127 adult individuals, 48 females and 79 males, were registered with a MicroScribe GT using the modern skeletal collection curated by the National Institute of Legal Medicine and Forensic Sciences.² The individuals in the sample came from five of the six natural regions of the country, mostly from the Andean area. The data obtained were processed with the 3D-ID software package in order to compare the population categories generated by the program with morphological features of each cranium.

Not surprisingly, results from 3D-ID indicate a diverse array of potential population groups. For example, 13% of the sample was classified as having African descent, 34% were classified as having a European origin, 10% were classified as Mesoamerican, and 33% were classified as South American. We argue that these results confirm a heterogeneous population structure and are a good first step in unveiling ancestry in Colombia. It is hoped that through increasing the sample size and additional statistical analyzes (i.e., k-means cluster analysis), we might begin to better understand population variation in Colombia and contribute to discussions surrounding population variation throughout Latin America.³

This is a useful analysis in the forensic context because it is the beginning of a series of geometric morphometric studies of the modern Colombian population. It will facilitate comparisons with other Latin American samples as programs such as 3D-ID and FORDISC begin to incorporate these new data. It is our hope that in the Colombian forensic context, the human identification process and the estimation of ancestry will contribute to the accuracy of presumptive and/or positive identifications.

References:

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2. Buikstra JE, Ubelaker DH. Standards for data collection from human skeletal remains. Fayetteville: Arkansas Archeological Survey, 1994
3. Ross AH, Ubelaker DH, Kimmerle EH. Implications of dimorphism, population variation, and secular change in estimating population affinity in the Iberian Peninsula. *Forensic Sci Int* 2011;206:2145.e1-214.e5.

Colombian Ancestry, Geometric Morphometrics, Population Variation