H82   Exploring Chinese Cranial Affinity Within "Hispanic" Populations

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The goal of this presentation is to refine biological profiling for Hispanic populations using geometric morphometrics.

This presentation will impact the forensic science community by highlighting the importance of understanding biological variation in the determination of ancestry for populations broadly grouped as "Hispanic."

Hispanics are the largest minority population in the United States, accounting for nearly 17% of the nation's total population. The term "Hispanic," or "Latino," is applied to individuals sharing a common cultural heritage, most often in reference to a common language (i.e., Spanish). Although the term does not refer to race or common ancestry, Hispanics are typically treated as a single ethnic group despite having distinct sociocultural and genetic backgrounds. Genetically, researchers usually characterize Hispanics as a mix of Native American, European, and African ancestries. However, even this description does not fully capture the complex ethnohistories and populational migration patterns unique to the populations which fall under the umbrella term of Hispanic.

For instance, during the mid 19th- to early 20th-century, Chinese immigrants arrived in many Central and South American countries as indentured manual laborers. Following England's abolition of slavery and its decline in the United States, the Chinese emerged as the major labor force for the sugarcane fields of Cuba and Peru. Concurrently, a community of ethnic Chinese formed in Panama around work on the Panama Canal Railroad Company. Despite the historical presence of Chinese populations in many Spanish-speaking countries, this biological variation is often overlooked in analyses of Hispanic skeletal remains. This study utilizes geometric morphometrics to examine regional variation among Hispanic populations in relation to Chinese affinity. Fifteen standard craniometric landmarks were collected from modern populations of Panamanians (n=22), Cubans (n=19), Peruvians (n=7), and Chinese (n=5) using a Microscribe™ G2X® digitizer in association with the software program *Three Skull*. Among-group variation was characterized using landmark-based Procrustes superimposition and thin-plate-spline approaches from geometric morphometry in conjunction with canonical variates analysis and Procrustes distances among groups. These analyses were performed in the shareware program MorphoJ. The first two canonical variates accounted for 98% of the total variation among groups. The Peruvian and Chinese crania clustered on opposite ends of a canonical variates plot, with the Cuban and Panamanian crania positioned between these two populations. Based on permutation tests (1,000 permutation rounds) for Procrustes distances among groups, all of the populations were significantly different from one another ($p \leq 0.05$) in terms of shape variation. Procrustes distances were utilized to characterize group affinity due to the small sample sizes. The Chinese crania exhibited the most similarity with the Hispanic crania in the following order from most to least: Cuban (0.036), Panamanian (0.041); Peruvian (0.043). Overall, the most morphological similarity was found between the Cuban and Panamanian crania (0.0296), while the least was found between the Cuban and Peruvian crania (0.047). Graphical visualization of shape revealed varying patterns of shape change between the Chinese and Hispanic crania at lambda, prosthion, basion, opisthion, and asterion.

These results can be explained in terms of the unique ethnohistories of Cuba, Panama, and Peru. Several morphological studies have shown Peruvians to be a relatively homogenous, indigenous population compared to other Latin American populations, such as Cuban and Panamanian which exhibit varying amounts of African and European admixture. The more heterogeneous nature of these two populations likely justifies their greater Chinese affinity compared to Peruvian crania. Not only does this study highlight the potential presence of East Asian ancestry in Hispanic populations, but reveals the importance of considering such information in standard forensic practice to create a more informative assessment of ancestry in unidentified Hispanics than is often utilized.

Ancestry, Hispanic, Geometric Morphometrics