



# Determining Ancestry of Unprovenanced Human Remains from the Grenadines, Southern Caribbean: Dental Morphology and Craniometric Analyses

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## Introduction

The bioarchaeological record of the southern Caribbean reflects a diverse population history due to the eventual replacement of founding indigenous groups by European and African populations as a result of colonial incursion and the Transatlantic Slave Trade. This complex history can present problems for proper dispensation of human skeletal remains, particularly those recovered outside the strictures of controlled excavation. In this case study, we examined a collection of unprovenanced skeletal material comprising four individuals of unknown ancestry deriving from a private collection on the island of Mustique in the southern Grenadines supposedly originating from the nearby island of Petite Mustique. Ancestry has been estimated using a combination of craniometrics and dental morphology, using the FORDISC database and the Arizona State University Dental Anthropology System (ASUDAS), respectively. We find that these data do not support Amerindian ancestry for these individuals, and instead suggest the remains are of European and/or African descent and therefore date to the post-Contact period. Ongoing stable isotope analyses should help in efforts to repatriate the remains to the appropriate governing body and location.

## Background

The Caribbean islands were originally inhabited by Amerindian people, likely of South American origin (Fitzpatrick 2006, Keegan 2000). However, they were rapidly decimated by the introduction of communicable diseases following European contact in the late 15th century. Subsequent growth of the Transatlantic Slave Trade resulted in replacement of indigenous populations by European colonists and African slave populations.

Petite Mustique is a small island of approximately 100 acres in the southern Caribbean, five miles offshore of the larger island of Mustique, where the remains were kept in storage. Both islands are now privately owned, but politically are a part of St. Vincent and the Grenadines, which comprises a chain of small, mostly volcanic islands in the Lesser Antilles. A single direct AMS date on human bone suggests at least one individual originates from 1436-1616 A.D., or around the time of contact.

The diverse population histories of the Caribbean islands necessitate careful assessment of ancestry affiliation. Although the provenience of remains is very important in any analysis, craniometric and dental morphology analyses can provide some information about peoples in the past.



Figure 1. Map of the Caribbean islands, inset of the Grenadines in the Lesser Antilles.

## Skeletal Analysis

The skeletal collection consists of 341 bones or bone fragments representing at least four adult individuals. An anthroposcopic analysis of ancestry was carried out for individual 4 (most complete skull). The interorbital width, low, rounded root of the nose, and somewhat prognathic facial profile, suggest these individuals may be of African descent.



Figure 2. Petite Mustique collection.

Biological profiles are shown in Table 1. Sex was assessed using all intact cranial and pelvic markers (White & Folkens 2005). Age was estimated using cranial sutures, and auricular surface morphology (Buikstra & Ubelaker 1994), depending on elements present for each individual. Stature and body mass formulae determined using Ruff (2012) and Auerbach & Ruff (2004) respectively.

Individual	Sex	Age	Stature (cm)	Body Mass (kg)	Pathology
1	Probable Male	35-39	164.5	-	-
2	Male	16-65	163.2	71.03	Osteophytic growth, resorption on clavicle
3	Female	23-52	-	-	Caries, antemortem tooth loss, mandibular abscesses
4	Possible Male	19-44	-	-	Hyperostotic nasal floor

Table 1. Summary of standard osteological analysis of four unprovenanced individuals.



Fig. 3. Ind. 2 right clavicle.

**Occupational Stress.** The sternal end of the right clavicle of individual 2 exhibits excessive bony growth and resorption (left). Large muscle insertions, including the deltoid insertion on the humerus and the pectoralis major insertion on the clavicle, may indicate frequent abduction/adduction, suggesting high levels of physical activity in life.

**Dental Morphology.** A suite of 23 ASUDAS traits were assessed according to Turner et. al. (1991) and Scott and Turner (1997) using associated plaques. Our analysis is qualitative, as no statistical analyses could be done for this sample size (n=4). We determined that the individuals present had a low level of enamel extension expression, common expression of molars with at least 4 cusps, a low rate of single-rooted molars, and no shoveling on UI2 and UC (see Figure 4). All of these traits indicate either European or African descent, not Amerindian ancestry.



Fig. 4. Ind. 4 mandible.

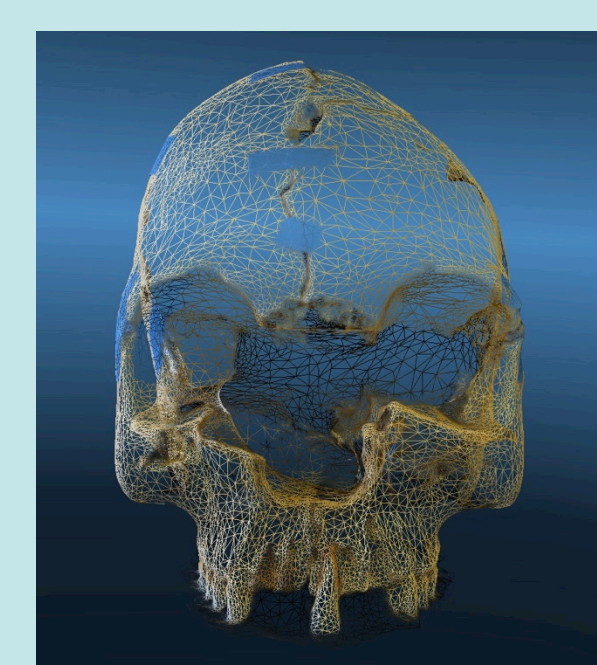


Fig. 5. Ind. 4 photogrammetry.



Fig. 6. Ind. 3 neurocranium.

**Craniometrics.** Standard cranial measurements (Buikstra & Ubelaker 1994) were entered into the FORDISC database. Of the four individuals, FORDISC only confidently identified individual 2 (black male). However, this could be questioned as individual 2 is comprised of only a frontal and a mandible. Individual 1 had posterior probabilities < 0.05, so we reject the hypothesis that the individual belongs to the classification group. Individuals 3 and 4 had posterior probabilities < 0.01, indicating that the individuals may not belong to any of the groups compared against, are missing necessary measurements, or are distorted. These results are reasonable as the measurements for individual 3 consist only of neurocranium measurements (see Fig. 6) and individual 4, which yielded the most complete cranial measurements, displays some cranial deformation (see Fig. 5) either from postmortem processes or pathology.

## Discussion

**Ancestry Evaluation.** Given the standard skeletal analysis, dental morphology, and craniometrics undertaken here, we conclude that the individuals in this collection are probably not of Amerindian descent, and likely came to the New World following European contact.

Because of the small sample size and equivocal FORDISC results, we are unable to distinguish whether these individuals are of European or African descent. It is possible that these remains represent admixed individuals, as these samples date to a time of prevalent population admixture (Benn-Torres et. al. 2008). In addition, the individuals present may not be of the same geographic or temporal origin, as no record of the context of recovery exists and not all individuals have been directly radiocarbon dated.

The radiocarbon date obtained suggests that at least one individual in this collection lived around the time of European contact with the Southern Antilles. This may indicate that the individuals present could be early immigrants to the region. A rib and tooth sample were submitted for <sup>13</sup>C/<sup>12</sup>C, <sup>15</sup>N/<sup>14</sup>N, and <sup>87</sup>Sr/<sup>86</sup>Sr isotope analysis at the Stable Isotope Lab at University of Florida, Gainesville. This analysis, which is underway, may help isolate a geographic region of origin for these individuals. To further distinguish ancestry of these individuals, DNA analyses would be necessary.

**Stewardship.** Unfortunately, much of the information that could have been gathered from this skeletal collection was lost when these individuals were removed from their original context without recording the provenience and association of the material. In addition, permanent glue was used on several skulls, making some reconstructions and subsequent metric analyses of the specimens difficult or impossible, as well as causing permanent damage to the bone. Preservation of remains is necessary for analysis and proper repatriation. Education and outreach about cultural heritage and principles of archaeology can help mitigate the loss of archaeological information. Particularly in small communities, outreach programs can have a widespread effect on the preservation and respect for archaeological remains, and may improve current archaeological practices and local histories.



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