

## ABSTRACT - BIOARCHAEOLOGY

### **AN EAR TO THE GROUND: MORPHOLOGICAL ANALYSES OF THE BONY LABYRINTH AS A TOOL TO STUDY BRAZILIAN PRECOLONIAL POPULATION HISTORY**

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Inferences regarding the relationships of kinship are a central element of the archaeological interpretations on the settlement of the American continent. Traditionally, these studies focused on morphological comparisons of anatomical regions (e.g., crania) and, more recently, on molecular data (i.e., aDNA). However, archaeological crania often do not preserve anatomical integrity while aDNA is affected by diagenesis. The advance of computed tomography brought forward a new approach to anthropological research, termed Virtual Anthropology. Unlike previous methods, this approach can operate with complex databases and can study effectively internal anatomical structures, such as the bony labyrinth. Recent studies suggest that the bony labyrinth records genetic distances between populations, due to its prenatal formation, developmental stability, and conformation to a model of serial founder effects. Located in the petrous part of the temporal bone, this structure presents as advantages (1) its study not being destructive, (2) not being

affected by diagenesis, and (3) preserving well in the archaeological context. To validate the use of this new method in a Brazilian context, this study analysed the labyrinths of several Brazilian archaeological groups (Toca do Alexandre, Justino, Caixa d'Água, Lapa do Santo, Tenório, Piaçaguera, Moraes, Capelinha and Laranjal). Alternative scenarios of population history in South America were then compared with other anatomical and molecular sources of data. Thus, this study pioneers Virtual Anthropology in Brazil and contributes with a new tool to reconstruct, explain, and model the narrative of past populations in Brazil and elsewhere.