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Indigenous animal management practices on the eve of Columbus' landfall: Isotopic and zooarchaeological investigations in the Dominican Republic and Jamaica

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Summary

This dissertation investigates the functioning of human-animal interactions at pre-Columbian Indigenous sites located in the Dominican Republic and Jamaica. The five different case studies that comprise this work investigate the mortality ages and morphologies of animals, and the dietary linkages between humans and several animal species commonly found in archaeological sites throughout the Greater Antilles. These include domesticated dogs (*Canis familiaris*) and two species of capromyid rodents endemic to the region, namely extant Jamaican hutia (*Geocapromys brownii*) and extinct Puerto Rican hutia (*Isolobodon portoricensis*). The latter is a species that originated on the island of Hispaniola and likely went extinct in the early 16th century. It was long theorized that *Isolobodon portoricensis* was managed or possibly underwent nascent domestication. This is due to their ubiquity and abundance in zooarchaeological assemblages from Hispaniola and in the Puerto Rican and Virgin Islands where it was likely purposefully introduced by Indigenous peoples. This dissertation examines the zooarchaeological evidence of hutia management and assesses whether there is evidence of the purposeful feeding or scavenging behaviors as evidenced in their dietary isotope values of tooth enamel carbon ($\delta^{13}\text{C}_{\text{en}}$), and bone collagen carbon ($\delta^{13}\text{C}_{\text{co}}$) and nitrogen ($\delta^{15}\text{N}$). This is predicated on the fact that maize (*Zea mays*), a C_4 metabolic pathway domestic plant that is commonly identified at archaeological sites throughout the Caribbean, tends to raise carbon values within a consumer's tissues. Isotopic analysis of animal remains is therefore often employed throughout the Americas to determine the consumption of maize and thus serves as a proxy for investigating closeness in human-animal interactions. The first case study is an isotopic and morphological investigation into the dietary and mobility patterns of dogs recovered from 16 Indigenous sites throughout the Caribbean region, comparing isotopic data from the Greater to Lesser Antilles, Early to Late Ceramic Ages, modified to unmodified remains, burials versus nonburials, and locals versus nonlocals as determined from strontium ($^{87}\text{Sr}/^{86}\text{Sr}$) analysis. Food Reconstruction Using Isotopic Transfer Signals (FRUITS v. 3.0) dietary mixing modelling was employed on four buried dogs, determining that dog diets are like that of humans from the region and exemplifying the close relationships between both species. The second case study is a zooarchaeological study of the recovered fauna from the settlement of El Flaco (cal. AD 990-1452) and details the identification of roughly half of the animal remains recovered from the site, assesses the dietary importance of different species including hutias, and provides updated last occurrence dates for some taxa. These results are then interpreted within the greater schema of palaeoenvironmental work done in the region and speculates as to networks of exchange occurring between this hinterland settlement and coastal areas. The third case study examines the collagen values of *Isolobodon portoricensis* from El Flaco and three other Indigenous sites located in the Dominican Republic, El Carril (cal. AD 1030-1262), El Cabo (cal. AD 604-1504), and La Entrada (cal. AD 840-900). Other endemic species were analysed as well as domesticated guinea pig (*Cavia porcellus*), and these results were compared to the collagen dietary isotope values of humans and dogs from the site of El Flaco. The results indicate that some hutias were consuming similar foods to humans although not in a systematic way that might denote the captive management and purposeful feeding of maize

to the whole population. Morphological reconstruction was also conducted on hutias, providing some indication as to the possible mortality ages of this species. Case study number four combines enamel and collagen values of hutias, edible rats, and guinea pigs from the sites of El Flaco, El Carril and La Entrada, and employs FRUITS to more accurately demonstrate that some individual hutias were likely consuming significant quantities of maize. The fifth and final case study is a combined isotopic and zooarchaeological study of the site of White Marl, Jamaica, and provides isotopic evidence of the consumption of maize by Jamaican hutias at the site. These studies provide evidence of either the purposeful feeding of some hutias, or more probably that hutias were successfully scavenging from human garden plots. In the frame of niche construction theory, the evidence presented in this dissertation relates to the environmental practices of Indigenous peoples. Slash-and-burn farming was a widely practiced environmental management strategy throughout the region that likely created mosaiced plant communities of garden plots and old-growth forest. These mixed anthropogenic and natural environments have been shown to be beneficial to some dietary generalists, and the abundance of hutias in archaeological sites might be the result of 'garden hunting' strategies targeting an animal that is a beneficiary of human ecosystem engineering. This may have constituted a form of animal management that is tied to plant food production, and therefore represents an arguably sustainable form of low-level food production.