

In Search of: Parasite Diversity in Pre-Columbian Coprolites

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DNA extraction and sequencing of pre-Columbian coprolites has provided information on the fecal microbiota and parasite burden of ancient humans. Nine pre-Columbian coprolites from the Island of Vieques, Puerto Rico, were utilized to determine the zoonotic and anthroponotic parasite diversity as well as the probable disease burden in two co-existing cultures; the Huecoid and Saladoid. The cores of the coprolites were used for DNA isolation and metasequencing. Bioinformatics revealed sequences of important enteric parasites such as: *Giardia spp.*, *Cryptosporidium spp.*, *Necator spp.*, *Ancylostoma spp.* and *Ascaris spp.* Among the zoonotic parasites: *Plasmodium spp.*, *Leishmania spp.*, *Babesia spp.*, *Theileria spp.*, *Eimeria spp.*, *Shistosoma spp.*, and *Trichinella spp.* were detected. Interestingly, the sequences found included some of parasite vectors such as *Anopheles spp.*, *Aedes spp.*, *Biomphalaria spp.*, and *Cavia spp.* The presence of the latter sequences may be explained by the consumption of the host species (such as rodents), although the presence of mosquito sequences cannot be explained the same way. Most of the detected parasites are those that can be transmitted by the fecal-oral route. The presence of *Giardia spp.* and *Cryptosporidium spp.* is in fact surprising since these pathogens usually cause enteritis, an affliction incompatible with the formation of coprolites. Although multiple infections were apparent, which lead to suspect poor overall health, finding coprolites clearly indicated that there were no symptoms associated with gastroenteritis. This may be a result of coevolution allowing host resistance to diseases brought about by enteric parasites.