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Applying new approaches to modeling diet and status: isotopic evidence for commoner resiliency and elite variability in the Classic Maya lowlands

Andrew D. Somerville [a,*], Mikael Fauvelle [a,1], Andrew W. Froehle [b,2]

[a] Department of Anthropology, University of California, San Diego, 9500 Gilman Drive 0532, La Jolla, CA 92093-0532, USA
[b] Department of Community Health, Division of Morphological Sciences and Biostatistics, Lifespan Health Research Center, Boonshoft School of Medicine, Wright State University, 3171 Research Blvd, Kettering, OH 45420-4014, USA

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ABSTRACT

Classic Maya states were characterized by a high degree of socioeconomic stratification. This paper investigates the degree to which status, as defined by grave goods and tomb construction, influenced dietary patterns of elites and commoners throughout the Classic Period (200–900/1000 AD) of the southern lowlands. We compile a database ($N = 102$) of previously-published stable isotope ratios ($\delta^{13}C$ collagen, $\delta^{13}C$ apatite, and $\delta^{15}N$ collagen) from Maya bone mineral and collagen, and interrogate these data through two new isotopic modeling techniques: a simple carbon isotope model (Kellner and Schoeninger, 2007; Froehle et al., 2010) and a multivariate isotope model (Froehle et al., 2012). We find that Maya elite diet varied significantly through time in terms of maize consumption and trophic level, while commoner diet remained remarkably stable. These findings provide new information relevant to studies of ancient Maya class structure and to studies of subsistence strategies of the pre-Columbian Americas.

1. Introduction

A key component in the study of complex societies concerns the degree to which they are characterized by social and economic stratification. Social distinctions between 'elites' and 'commoners' are well-established characteristics of archaic statehood, and are used by archaeologists working throughout the world (Marcus and Feinman, 1998: 6–7). Generally, such divisions are made through the study of how goods and resources were acquired and divided across a community. This is often done through the analysis of burial patterns, under the assumption that elites had greater access to high-value objects, were buried closer to ceremonial/political centers, and had more time invested in construction of their tombs (Chase and Chase, 1992b; Smith, 1987; Tainter, 1975). A complementary approach is to directly examine ancient peoples themselves through the study of osteology, paleopathology, and stable isotope analysis, to investigate differences in health, dietary practices, or cultural modifications to the body (Buikstra and Beck, 2006; Whittington and Reed, 1997a). In this paper we conduct an isotopic meta-analysis of ancient Maya diet and status in order to build a diachronic understanding of the relationship between dietary patterns and status affiliation during the ancient Maya Classic Period (250–900/1000 AD).

Patterns in dietary choices are recognized as having a close relationship to the identity of a consumer or social group (Mintz and Du Bois, 2002). Especially relevant is the link between diet and class (Goody, 1982; Gumerman, 1997). Due to socially-learned and status-linked dietary behaviors and attitudes, elites and commoners often differ in consumptive practices (Bourdieu, 1984). Food items themselves can play a key role in the negotiation of status and power. Socially desirable foods may be conspicuously consumed as part of elaborate feasts, either through elite-sponsored patron-role feasts designed to reinforce social indebtedness of individuals with lesser means (Dietler, 2001: 82–85; Mauss, 1990), or through diacritical feasts that serve to elevate and legitimize stratified class distinctions (Dietler, 2001: 85–88). Additionally, elites and commoners often have access to different food types, which may correspond to differences in quality or social desirability of the foodstuff. Elites may enjoy greater access to particular items simply due to the privilege associated with their socioeconomic standing, including their greater access to non-local

* Corresponding author. Tel.: +1 480 220 3000; fax: +1 858 534 5946.
E-mail addresses: asomervi@ucsd.edu (A.D. Somerville), mfauvell@ucsd.edu (M. Fauvelle), andrew.froehle@wright.edu (A.W. Froehle).
[1] Tel.: +1 858 534 4145.
[2] Tel.: +1 937 775 1413.

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food markets (Gumerman, 1997). Studies of differential consumption thus provide information on structured relations of ancient societies.

Research in Mesoamerica, the geographic region stretching from Northwest Mexico to portions of Panama, has long focused on the relationship between diet and status (e.g., Emery, 2003; Schoeninger, 1979; Turkon, 2004). Isotopic studies of bone tissue and tooth enamel, now routinely utilized in archaeological investigations, operate under the understanding that foods consumed in life leave characteristic signatures in preserved tissue (Schwarcz et al., 2011). Over the past several decades, isotopic analyses of human bone have made great strides in reconstructing dietary practices of the ancient Maya of Southern Mexico, Belize, and Honduras (e.g., White, 1999; Whittington and Reed, 1997c; Wright, 2006). Indeed, in terms of isotopic paleodiet studies, the ancient Maya are the most extensively investigated ancient civilization, and thus provide an excellent opportunity to explore issues of diet and status at a regional level. Previously-published regional isotopic assessments have explored gendered food behavior among the Maya (White, 2005), geographic patterning of diet (Gerry and Krueger, 1997), patterns of diet during the Maya Collapse (White, 1997; Wright, 1997; Wright, 2006; Wright and White, 1996), and the relationship between diet and status (Gerry, 1997). To date, however, no regional study has explicitly addressed the relationship between diet and status through time.

In this paper, we proceed with two goals: (1) to apply two new isotopic modeling techniques to a large archaeological database, and (2) to explore the dynamics of Maya hierarchy through time, taking into account both material correlates of wealth and patterns of food consumption. We compile a database of previously published Maya isotopic values ($\delta^{13}C_{collagen,}$ $\delta^{13}C_{apatite,}$ and $\delta^{15}N_{collagen}$) from the Early Classic (AD 250–600), Late Classic (AD 600–800), and Terminal Classic (AD 800–900/1000) periods, focusing on settlements within the southern lowlands. We interrogate these data by use of a simple carbon isotope model (Froehle et al., 2010; Kellner and Schoeninger, 2007), and a multivariate isotope model (Froehle et al., 2012). Applying these new methods permits a more complete picture of dietary patterns across time, and compiling data from multiple settlements allows a region-wide assessment of Maya social differentiation. The results of this study demonstrate that elite diet varied considerably across time, while commoner diet remained remarkably resilient.

2. Maya background

2.1. Status differences and food availability

The ancient Maya were a highly stratified society with strong divisions between social classes. While some researchers envision a stark two-class divide between Maya elites and commoners (Adams, 1981; Adams and Smith, 1981; Marcus, 1983; Thompson, 1954; Willey, 1980), others argue that Maya society was multi-tiered and highly variable, possibly containing a large "middle class" (Becker, 1973; Chase, 1992; Haviland, 1974; Sabloff and Rathje, 1975). Recently, dynamic models for social organization have become popular, emphasizing that Maya society varied considerably through both time and space (Iannone, 2002; Marcus, 1993,, 1998). Regardless of exactly how status differences were organized, the material culture of the ancient Maya provides a clear testimony to the differences that existed between the two extremes of the social spectrum. Maya nobility lived in large and well-constructed stone buildings that dwarfed the small wooden homes built by commoners. Such status divisions are also seen in burials: elite individuals were often treated to well-constructed tombs and crypts, whereas less affluent individuals were buried in simple graves and cysts (Haviland and Moholy-Nagy, 1992). Additionally, grave goods served as status markers for the dead, elites being interred with elaborate polychrome pottery, jade jewelry, and obsidian tools, and commoners buried with little in the way of non-perishable items.

Status differences among the Maya also resulted in differential dietary practices. Studies of animal remains from some Maya sites demonstrate that elites consumed more large mammals than commoners (Emery, 2003: 499; Masson, 1999; Pohl, 1985). Elite Maya may have had access to items acquired through tribute and long-distance exchange, whereas commoners may have lacked this ability. Evidence of tribute can be seen in Maya murals, such as at Bonampak, where stacks of cacao beans are shown being presented to a local ruler. Patterns of food production and dispersal might also create dietary differences between affluent inhabitants of urban centers and more rural populations. Periodic markets sponsored in site centers, for example, may have been more accessible to urban dwellers than to individuals living in peripheral settlements. Architectural and iconographic evidence for such markets can be found at the site of Calakmul, which sponsored a large market where food items such as maize gruel and tamales were exchanged (Carrasco et al., 2009). Although, in theory, ancient markets served to economically integrate class segments within a society and distribute prestige goods across differing socioeconomic levels (Hirth, 1998; Masson and Freidel, 2012), it remains likely that elites, due to material benefits associated with their rank, were able to obtain a greater variety of imported foods than were commoners. Finally, if elites sponsored or directed the construction and maintenance of intensive agricultural systems, including raised fields and hillside terraces (Flannery, 1982), it would follow that they might have had preferential access to the products of these investments, especially during times of resource stress.

Maya commoners, on the other hand, lacked many of these means of resource acquisition. Compared to elites, commoners had less political power and likely had fewer means by which to acquire imported goods (e.g., Lohse and Valdez, 2004). Botanical studies at Copan, one of the most extensively investigated ancient Maya cities, suggest that commoners had access to a lesser diversity of edible plants species than did elites (Lentz, 1991); isotopic studies of human bones from Copan demonstrate that elites enjoyed greater dietary diversity than commoners (Whittington and Reed, 1997b). Rather than acquiring much of their food through tribute or market exchange, commoners were more intimately involved in the production of their foodstuffs, having direct access to managed forests, home gardens, and milpas (Ford and Nigh, 2009; Gómez-Pompa and Kaus, 1992). Abrupt changes in material culture at some peripheral sites, however, mimic the timing and pace of change at political/ceremonial cores, indicating that peripheral communities were economically and socially linked to nearby regional centers (Ashmore et al., 2004). Indeed, it should be clear that major political and environmental events such as wars, alliances, droughts, and famines would have had significant repercussions for diets across the social spectrum. Nevertheless, elite subsistence strategies could be characterized as relying more heavily on political and economic circumstances, while commoner strategies were more directly articulated with local environments through household-based food production. Given that political and environmental changes did occur during the Classic period, two pertinent questions are raised: to what extent were class-based dietary differences expressed across time, and what do such differences tell us about the evolution of ancient Maya class structure? These questions may be addressed through dietary reconstruction using stable isotope analysis.