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Oaxaca and its neighbors in Prehispanic times: Population movements from the perspective of dental morphological traits☆

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ABSTRACT

The dynamic interaction among human groups in Prehispanic Mesoamerica led to population exchange and migrations that have just recently begun to be understood from a bioarchaeological perspective. Still, little is known about the demic biological affinities between Southern Sierra Madre populations and their coeval neighbors in Mesoamerica. The present paper focuses on biological affinities as assessed though dental morphology among three Prehispanic human collections from the present state of Oaxaca, Mexico, dated to the Classic (Monte Albán) and the Postclassic periods (Zaachila and Cerro Guacamaya). Here, we assess the extent of biological relationships within the region and with select contemporaneous groups from the *altiplano* (the Valley of Mexico), the Gulf of Mexico and Maya area. Population dynamics within the Oaxaca Valley show continuity between Monte Albán and Cerro Guacamaya. Zaachila, though contemporary to Cerro Guacamaya, diverges from the other Oaxaca groups. At the regional level, affinity is seen between Monte Albán and its coeval sample from the Maya and Mixe-Zoque fringe region. Sites in the *altiplano* and the Gulf of Mexico show relationships less stable over time. However, Cholula and Teotihuacán are more consistently separate from Oaxaca samples, perhaps indicating population interactions were fairly uncommon between these two regions, at least in the time frame analyzed in this study.

1. Introduction

Population movements in the past commonly mirror paths originated by trade activities and market exchange, even though they were also likely driven by a plethora of personal, social, economic, and political reasons (Arango, 2000; Cameron, 2013; Manning, 2005). Several models of migration use economic factors to explain migration, including the neoclassical push-pull theory, which claims that people move because of market offerings that attract them towards wealthier economies (pull) in response to less advantageous socioeconomic condition in the individuals' places of origin (push). The push-pull theory interprets population migration (and movement) as the result of economic factors. In this model the decision to move is entirely dependent on the individual's or group's rational decision. Alternatively, conflict theories do not separate causes of migration from their consequences. According to this theoretical perspective, human mobility is not just the product of unequal development and does not respond to natural causes. However, both the push-pull model and conflict theories often neglect that migration networks consist of all those interpersonal relationships (like family, friends and more) that link a potential migrant to other people who have already migrated. Although economic reasons are often an important impetus for individuals to move, a migration network is not necessarily strictly tied to the movement of a labor force (Arango, 2000).

In archaeological contexts, cultural evidence of contact among regions rests (among other factors) on the presence of foreign, imported materials and stylistic elements. However, an exchange of ideas or material culture may not by itself indicate that the exchange followed, or was triggered by, gene flow through biological contact or migration (Cucina, 2015a). To the contrary, skeletal evidence provides evidence of actual population mobility. Morphological affinities indicating population movement have been extensively explored in two regions in Mesoamerica, through the combined or independent analysis of dental morphological traits and strontium stable isotopes, spanning from the Maya realm (see for example Aubry, 2009; Cucina, 2015b; Cucina et al., 2015; Price et al., 2000; Wrobel, 2004 among the others) to the highlands of Central Mexico (Ragsdale and Edgar, 2015) in Classic and Postclassic times.

Little evidence is currently available of population affinities in other parts of Mesoamerica. As regards the Oaxaca region, the only analyses available are Christensen (1998a, 1998b), which focused on the

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Formative period, and Beekman and Christensen (2003) who analyzed the Valley of Oaxaca by time period rather than by site in a comparison with several collections from north of Mesoamerica. Regarding other aspects of Oaxacan prehistory, the anthropological literature lacks information on the province in general and on the Valley of Oaxaca in particular. This is somewhat surprising given the region's important geographic and cultural position, from the Formative to Postclassic times, and the presence of Monte Albán, one of the largest and most important sites in the Prehispanic period. The present paper contributes to filling this gap in the bioarchaeological evidence for population affinities by exploring population relationships in the Valley of Oaxaca and surrounding regions during Classic and Postclassic times through the analysis of dental morphological traits. In particular, it addresses specific questions of population continuity/discontinuity through time among the Valley's Prehispanic occupants and their biological (phenetic) affinities with contemporary groups in surrounding territories. Given limited sample sizes and in some cases the vague chronology of skeletal collections used, we do not mean for the research presented to be conclusive. Instead, with this paper we aim to generate new hypotheses and new potential directions for future research.

2. Regional background

The Oaxaca Valley was a rich and complex cultural landscape spanning from the first millennium BC to colonial times. In this millennial timeframe, Monte Albán stands out as the epicenter of the social, political and human relationships (O'Brien and Lewarch, 1992; Feinman et al., 1985). It was founded around 500 BCE, and until about 100 BCE (Monte Albán Phase I, Sherman et al., 2010) its strategic geographical position seems to indicate that conflicts that had initiated during the Rosario phase (700–500 BCE) continued as a concern for the local people. It is likely that migrants from San José Mogote and other settlements in the Etla Valley founded Monte Albán (Marcus and Flannery, 1996; Sherman et al., 2010). From its founding until at least the period known as Monte Albán Phase II (100 BCE–200 CE), Monte Albán's expansionistic, asymmetric (rather than concentric) strategy to gain control of the flow of resources contributed to the development of defensive urban centers, and to the coevolution of state societies in nearby regions, such as the Mixteca (Sherman et al., 2010:282).

Monte Albán's golden age corresponds to the Maya Classic period (MA IIIA – 200–500 CE; Balkansky, 1998), when the city grew, and maintained trade and political relationships with many territories in the *altiplano* and along the coast. During this phase, people from Oaxaca inhabited the Oaxaca *barrio* (district) at Teotihuacán. The direct connections with Teotihuacán have been confirmed on the human, individual level through Sr isotopes, which detected the presence of non-local individuals in the Oaxaca district in Teotihuacán (Price et al., 2000). Increasing evidence is now available also about the economic and social interactions and elite ties within the valley itself (Feinman, 2006, 2007; Marcus, 2006). In a similar fashion, more information is also available about the cultural interactions between Oaxaca sites and Puebla and Veracruz. However, unlike the osteological evidence indicating direct contact with Teotihuacán, no direct data is yet available from skeletal remains indicating biological connections with these other regions.

The hegemony and power exerted by Monte Albán decreased during the Classic period (Table 1), as it became part of new a tripartite sociopolitical system (Balkansky, 1998; Faulseit, 2012). Eventually, several commercial centers arose to become Oaxaca's primary urban sites (Faulseit, 2012; Murphy and Stepick, 1991). Despite their size and importance during this long period, none of these centers achieved the size that characterized Monte Albán before its decline (Feinman et al., 1985). The collapse of Monte Albán at the end of the Classic period was a slow decline process that occurred over several generations (Faulseit, 2012; Feinman, 2007). This process was "broadly coincident" (2007:9) in time with a wider sociopolitical disruption and reorganization (the Terminal Classic) throughout Mesoamerica. The Classic-to-Postclassic transition was not marked by massive invasions or population replacement (Feinman, 2007). The Classic period elite-driven system of political organization present at the end of the Late Classic (Monte Albán Phase IIIB – aprox. 800 CE) resulted in a more dispersed, balkanized (Balkansky, 1998; Faulseit, 2012) Early Postclassic sociopolitical organization.

Among the several Postclassic centers that would rise to their maximum splendor stands Zaachila. Jansen (1998) mentions the Zapotec expansion of Zaachila towards the Isthmus of Tehuantepec in the fifteenth century, shortly before the colonial era. Geographically, the isthmus leads indirectly to the Maya area through a Mixe-Zoque fringe zone. Paddock (1966) published a series of tentative maps that showed the distribution of material culture from Oaxaca to other regions in Mesoamerica, including sites in the Peten region of Guatemala that correspond in time to Monte Albán Phase II (100 BCE–300 CE), which parallels the Maya Late Preclassic period. However, little archaeological evidence is available that supports the hypothesis of a direct contact between the Oaxaca Valley and the Maya population.

Resting on the assumption of morphological continuity through time in the Oaxaca Valley region, as partly highlighted by Beekman and Christensen (2003), and on the theory of isolation by distance, the present paper explores the phenetic affinities between sites in the Oaxaca region and in neighboring areas, encompassing the Highlands to the north, the Maya area on the East, and Veracruz on the Gulf Coast, through the analysis of dental morphological traits in human samples dated to the Classic and Postclassic periods. Isolation by distance posits that, the more two groups are geographically isolated from each other, the more different they tend to become genetically (Wright, 1943; Ishida, 2009). Isolation by distance is the simplest model for population biological interaction. We use it as the present research is an initial approach to understanding human movement and migration between the Oaxaca Valley and other regions during Prehispanic times.

Table 1
List of samples used in the dental morphology analysis, sample size and chronology. Chronological periods after Joyce (2010).

Site	Period	Chronology	Geographic location	N. individuals analyzed
Monte Albán	Late Classic	500–800 CE	Oaxaca	171
Zaachila	Postclassic	900–1500 CE	Oaxaca	47
Cerro Guacamaya	Late Postclassic	1200–1500 CE	Oaxaca	37
Cholula	Late Postclassic	1200–1500 CE	Puebla	31
Teotihuacán	Early Classic	200–500 CE	Valley of Mexico	19
Tlatelolco	Late Postclassic	1300–1500 CE	Valley of Mexico	122
Valley of Mexico	Late Formative/Early Postclassic	500 BCE–1000 CE	Valley of Mexico	78
Puebla	Late Postclassic	1300–1500 CE	Puebla	29
Veracruz	Late Classic/Postclassic	500–1500 CE	Veracruz	108
Toniná	Classic	300–700 CE	Chiapas (Maya)	33

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