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The Calusa and prehistoric subsistence in central and south Gulf Coast Florida

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ABSTRACT

The south Florida Calusa are noted for their complex social organization coupled with their forager-fisher subsistence strategy. Social and political complexity have often been attributed to a reliable resource base, most frequently agricultural products such as maize (*Zea mays*), and surplus stored foods. Recent reconsiderations of complexity for coastal populations, however, have questioned the stability of coastal resources citing ample evidence of periods of fluctuating instability. They have in turn emphasized the importance of other cultural mechanisms, such as resource exchange, in fulfilling subsistence needs during times of uncertainty.

In this paper, we consider the complex food web of the central and south Florida Gulf Coast. We combine data on the zooarchaeological and archaeobotanical remains from the archaeological sites with those from stable carbon and nitrogen isotopic ratios of archaeological human bone, and modern and archaeological plants and animals. These multiple lines of evidence confirm that marine-based protein and terrestrial C_3 plants provided a large and reliable portion of the diet in southwestern Florida as early as 4000 years ago and up to European contact.

1. Introduction

When Europeans came to southwest Florida in the early sixteenth-century, they encountered the Calusa chiefdom comprised of nobles and commoners. The principal ethnohistoric accounts (Fontaneda, 1944; Hann, 1991; Solís de Merás, 1964; Worth, 2014) all describe the Calusa as a society with a paramount leader variously named Carlos or Caalus, and other leaders or local headmen in charge of subordinate towns. The historic accounts reported that they had a maritime economy but grew no crops. The contention that the Calusa were a ranked society that practiced no agriculture captured the attention of anthropologists and historians for decades (e.g., Goggin and Sturtevant, 1964; Hann, 1991; Marquardt, 1986, 1992a, 1992b; Milanich et al., 1984; Widmer, 1988).

Virtually all other eastern Woodlands populations that exhibit complex political organization were maize agriculturalists. Previously, the association between complexity and subsistence was almost universally attributed to resource intensification – a society must have dependable resources and a surplus of those resources to allow some members to specialize in non-subsistence tasks. Crops were often the resources stressed, but there was also the recognition that other types of resources could provide a stable resource base. For instance, Goggin and Sturtevant (1964) proposed that it was intensification in the harvesting of mullet that allowed for the complexity exhibited by the Calusa. Focused forager-fisher economies seemed to provide the type of stable resource base necessary for complex social and political evolution (see various papers in Price and Brown, 1985; Arnold, 1996).

Recently, however, archaeologists have begun to make more cautious interpretations about social and political complexity in coastal populations such as the Calusa (Marquardt, 2014; Moss, 2012; Thompson and Worth, 2011), especially regarding just what complexity meant for coastal forager-fishers and how long before

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European contact it occurred. For the Calusa, this reconsideration has been accompanied by the accumulation of fine-grained archaeobotanical and archaeozoological data in the region that suggest a diet focused on marine species, but which regularly included terrestrial plants and animals in a mixed subsistence economy (e.g., deFrance and Walker, 2013; Hutchinson, 2004; Newsom, 1991; Newsom and Scarry, 2013; Norr, 2004; Norr and Hutchinson, 1998; Scarry, 1999; Walker, 1992a). Combined with geological data, the archaeological remains also suggest that coastal resource availability varied across both time and space (deFrance and Walker, 2013; Newsom and Scarry, 2013; Marquardt and Walker, 2013a, 2013b; Walker, 1992a).

The presence or absence of prehistoric maize continues to be one of the enigmatic issues of Calusa life. Several lines of evidence have supported the notion that the Calusa practiced no horticulture. For instance, maize appears to be absent in archaeological deposits, although there was very little systematic archaeobotanical or archaeozoological research done in south and central Florida until after 1990. Systematic studies done after 1990 have produced no evidence of prehistoric maize below the panhandle of Florida (e.g., Newsom, 1991, 1998; Newsom and Scarry, 2013; Scarry and Newsom, 1992). To add to the absence of maize remains, Johnson (1990) demonstrated that the soils in south Florida could not have supported stable maize cultivation. Finally, isotopic analysis of the pericontact population at Tatham Mound in Citrus County did not have carbon signatures that could be due to a C_4 plant diet (Hutchinson and Norr, 1994; Hutchinson et al., 1998, 2000).

On the other hand, maize pollen reportedly dated between 450 B.C. and A.D. 200 at the south Florida site of Fort Center fueled debates about precolumbian maize agriculture for decades (Sears, 1982, 1977). Recent AMS radiocarbon dates and reassessment of botanical remains from Fort Center, however, demonstrates that none of the maize pollen there is from contexts prior to European contact (Thompson and Pluckhahn, 2014; Thompson et al., 2013). Yet, sporadic accounts of maize along the central Florida routes of Narváez (Cabeza de Vaca, in Adorno and Pautz, 2003) and De Soto (Milanich and Hudson, 1993) contradict the apparent absence of maize recovered from archaeological sites. Most recently, human dietary reconstruction using stable isotopes of carbon and nitrogen has indicated some consumption of plants utilizing the C_4 photosynthetic pathway, which could be interpreted as maize (Keegan, 1987; Kelly et al., 2006; Tykot et al., 2005).

Archaeological remains of botanical cultivars, some possibly domesticated or in a quasi-domesticated state, are present in prehistoric south Florida, but maize is not among them. Squash (*Cucurbita pepo*), bottle gourd (*Lagenaria siceraria*), chile pepper (*Capsicum* sp.), and papaya (*Carica papaya*) all appear in archaeological deposits and at least some appear to have been managed (Newsom and Scarry, 2013). *Setaria* and/or other panicoid grasses are abundant in some south Florida archaeological deposits demonstrating a reliance on wild grain collection. Moreover, *Setaria* was shown by Farnsworth et al. (1985) to be closely tied to the development of a maize-focused economy in the Tehuacan Valley. Maize, *Setaria,* and the other Panicoid grasses plants all utilize the C_4 photosynthetic pathway; thus, an isotopic signal suggesting C_4 plants complicates any dietary reconstruction (see detailed discussion of photosynthetic pathways in Section 4.1).

2. Research questions and expectations

Stable isotope dietary reconstruction has been applied to several archaeological questions in peninsular Florida including patterns of coastal and agricultural resource adaptation (e.g., Hutchinson et al., 1998; Hutchinson, 2004; Hutchinson and Norr, 2006; Keegan, 1987; Kelly et al., 2006; Norr, 2004; Tykot et al., 2005). This study examines the subsistence patterns of prehistoric central and south Florida populations and the role of dietary choice and stability in the complexity reported historically for the Calusa. The stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotopic ratios of archaeological human bone collagen and apatite carbonate are reported for a sample of 10 individuals from Caloosahatchee sites in southwest Florida, dating between A.D. 500 and 1550. We contextualize the Calusa human data by including isotope samples that reach temporally back to the Archaic (3100 B.C.; $n = 3$) and spatially north to the Central Gulf Coast (A.D. 500–1500; $n = 28$). Reconstructing diet for multiple individuals from a number of coastal sites from different time periods within the Calusa heartland and adjacent regions of the south Florida Gulf Coast allows for an evaluation of dietary variability within and between populations across time and space.

Importantly, we supplement the human data by a large number of plant and animal remains from modern and archaeological contexts. Comparison of human diet to the isotopic composition of local food resources, and the zooarchaeological and archaeobotanical remains from archaeological contexts, provides a framework for dietary interpretations and helps resolve the relative proportions of dietary resources used (e.g., marine versus terrestrial). These data also establish confounding factors for the detection of maize, a tropical cultigen, in a complex subtropical foodweb.

In this article we move beyond the question of the presence or absence of domesticated plants (i.e., maize) to the larger issue of the entire food web of central and south Florida Gulf Coast populations. Complementing the archaeological plant and animal data that accumulate over long temporal spans, stable carbon and nitrogen isotopic analysis of human bone provides average diet during the life of an individual (Schoeninger, 1995; however, technically bone turnover ranges up to ten years, Sealy et al., 1995). We focus on three main questions: (1) What was the role of maize and other C_4 plants as contributors to the diet? (2) What was the role of marine vs. terrestrial subsistence resources? (3) Do the human stable isotope data support plant and animal remains that indicate the diet of Florida Gulf Coast populations varied across time and space?

3. Environmental and archaeological context

Florida has the longest shoreline in the United States at 13,676 km, with massive areas of open estuaries and tidal marshes along the Gulf Coast (Livingston, 1990). This rich biotic environment has afforded a dependable subsistence base for the human inhabitants living along the coast at least since the beginning of the Archaic period (8000 B.C. lasting until about 500 B.C.; Milanich, 1994). The protected waters of the lagoons that lie behind barrier islands provide substantial food resources, as do the near-shore environments of the barrier islands. Adjacent terrestrial areas include grasslands, freshwater marsh, cypress and mangrove swamp, and pine forests that are both home to and foraging areas of numerous mammals, birds, reptiles, freshwater fish, amphibians, and freshwater molluscs.

3.1. Ten Thousand Islands (Glades)

The Ten Thousand Islands is often referred to as a subregion of the Glades region (Milanich, 1994; Figs. 1 and 2). It is located south of the Caloosahatchee region, and subsumes the western Everglades. It is an environmentally diverse region, with a variety of wetlands broken by areas of higher ground inland. Among the better-known archaeological sites are Key Marco (Cushing, 1897; Widmer, 1996) and a series of Late Archaic and Glades period sites