THE PALEOETHNOBOTANY OF THE FELTUS MOUNDS SITE

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An honors thesis submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the degree of Bachelor of Arts with Honors in the Department of Anthropology.

Chapel Hill
2008

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ABSTRACT

LEAH WILLIAMS: The Paleoethnobotany of the Feltus Mounds Site
(Under the direction of C. Margaret Scarry)

This thesis explores the use of plant resources at Feltus Mounds (ca. AD 700-1000), an early Coles Creek period site in Jackson County, Mississippi. Through analysis of flotation samples from Feltus, I evaluate three separate contexts within the site. The samples, which contain no maize, suggest a reliance on wild and casually cultivated resources—an overall pattern of Coles Creek subsistence practices. In order to assess interregional subsistence variability, however, I have also compared the Feltus plant assemblage to that of three contemporaneous Coles Creek sites in the Tensas Basin of Louisiana. These comparisons show broad similarities between Feltus and the Tensas Basin sites, but also illustrate key dissimilarities. Variability among and within the sites is likely caused by functional and ecological differences.

ACKNOWLEDGEMENTS

Many thanks are due to those who have graciously helped me through the course of this project. I would especially like to thank my advisor Dr. C. Margaret Scarry. She was an invaluable aid not only during the writing process, but throughout my time in the laboratory. Special gratitude also goes to my committee members Dr. Vincas Steponaitis and Dr. John Scarry, who leant great support and advice. I am thankful for the mentorship of Ben Shields. He has helped me from the very beginning to (quite literally) the very end. Furthermore, I would like to acknowledge Katherine McKisson Roberts's research in the Tensas Basin, which is the basis of my interregional comparisons.

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INTRODUCTION

From roughly AD 700 to 1200, socially complex Coles Creek cultures inhabited the Lower Mississippi Valley and built numerous mound centers throughout the region. For many cultures of the Late Prehistoric southeast, the construction of monumental earthworks arose out of sociopolitical hierarchies created by the intensification of maize agriculture (Fritz 1998). At first the assumption that Coles Creek people were farmers relying on maize to support their largely sedentary lifestyle and civic building projects seemed logical. However, evidence from archaeological investigations failed to provide support for this assumption. It became apparent that Coles Creek populations were an exception to this supposed link between agriculture and hierarchical organization.

As subsistence-based research has increased in the Lower Mississippi Valley, the potential for variation in historical trajectories has become clear. The peoples of the Coles Creek period were not farmers, but rather fisher-hunter-collectors and possibly small scale gardeners (Fritz 1998). Even among Coles Creek sites, there are considerable variations in subsistence patterns.

In light of these issues, my study seeks to examine the use of plant resources at Feltus Mounds, an early Coles Creek mound site near Natchez, Mississippi. To do this, I analyzed 19 flotation samples recovered from the Feltus site by the University of North Carolina in 2006 and 2007. Two main goals were set for the research: to better understand varying intrasite contexts, and to compare the plant assemblage of Feltus to other contemporaneous Coles Creek sites. Flotation data from the Hedgeland, Lisa’s Ridge, and Shackleford Lake sites in northeast Louisiana, all analyzed by Roberts (2006), were chosen for comparison.

COLES CREEK BACKGROUND

The Coles Creek culture was present in the Lower Mississippi Valley from about AD 700 to 1200. Coles Creek settlements spanned from the mouth of the Arkansas River to the Gulf Coast (Kidder 1992). Even though the Late Coles Creek period (AD 900-1200) chronologically coincides with Emergent/early Mississippian societies, the two populations were culturally distinct from one another (Fritz and Kidder 1993).

Coles Creek mound complexes usually consisted of platform mounds situated around a central plaza, and it is likely that they served as sites for ritual activities such as feasting (Brain 1978; Fritz 1995, 1998). Most Coles Creek people lived in small, single family or extended family hamlets, which were fairly widely dispersed (Fritz and Kidder 1993). Therefore, notions of status were probably derived from kin-group associations (Fritz 1995).

Subsistence

Archaeologists have long been concerned with issues of prehistoric agriculture in the Southeast, and have put much effort into researching its origins. During the Woodland period, agricultural economies were adopted by many cultures in the Eastern Woodlands, inducing great change in the region. These changes were not ubiquitous throughout the Southeast, however, because cultures of the Lower Mississippi Valley and Gulf Coast remained distinct from their regional neighbors (Steponaitis 1998). Indeed, Coles Creek people continued their largely hunter-gatherer lifestyles, and did not replace wild resources with domesticates.

The distinctive nature of Coles Creek subsistence practices was not at first recognized by archaeologists, who failed to appreciate the possibility of variation within the Southeast.

Applying broad regional generalities, they used models that were based on faulty assumptions. Fritz notes:

> Until recently, our scenarios for the beginnings of agriculture in the South were permeated by four assumptions: (1) that all hunter-gatherers were nomadic, with lower population densities than farming societies; (2) that all mound-building cultures in the Mississippi Valley were agriculturally based; (3) that all serious agriculture in this region had corn as the dominant crop; and (4) all major crops in eastern North America were initially domesticated in Mesoamerica (i.e., Mexico and Central America). We now know that all four of these assumptions were wrong [Fritz 1998:23].

Based on these assumptions, it was believed that the Coles Creek people must have been agriculturalists who started farming around AD 700-900 (Fritz and Kidder 1993). Furthermore, it was supposed that maize must have been an important dietary staple. Paleoethnobotanical research, however, has painted a different picture of Coles Creek subsistence.

It is now evident that Coles Creek people were not farmers, but rather complex hunter-gatherers. These fisher-hunter-collectors relied on the abundance of plants, fish, and mammals present throughout the year in the Lower Mississippi Valley. The plant resources used by Coles Creek populations were almost exclusively wild and included a variety of nuts, starchy and oily seeds, and fleshy fruits (Fritz and Kidder 1993). Since these wild resources were so plentiful, they were able to pursue activities such as mound-building (Fritz 2000). Moreover, this lack of nutritional stress and the potential for surpluses are likely reasons Coles Creek people were not strongly motivated to make an early transition to farming (Fritz 2000).

A number of indigenous, domesticated plants, such as squash, sunflower, sumpweed, and chenopod, were available at this time in the Southeast and Midwest, but research to date on Coles Creek sites has primarily found wild forms of these plants. Fritz and Kidder's project at the Osceola site in Louisiana, for instance, found no remains of "clearly domesticated" plants, with the exception of cucurbita (squash) (Fritz and Kidder 1993). From this, they determined that domesticates remained insignificant in this area until after AD 1100 (Fritz and Kidder 1993). It is important to note, however, Coles Creek subsistence research has largely been focused on sites in Louisiana, west of the Mississippi River. More research at sites like Feltus is needed to facilitate a better understanding of what was happening east of the Mississippi.

Even if they were not growing domesticated plants, Coles Creek hunter-gatherers certainly understood concepts of plant husbandry and probably practiced small-scale cultivation as a means of managing wild resources (Fritz 1995, 2000). Cultivation can include a range of activities from intentionally selecting for desired plant characteristics, such as larger seeds, to simply fostering the growth of preferred plants. Plants like maygrass and erect knotweed were very common, and probably subject to cultivation, but they were not domesticated (Fritz 1998). Nut and fruit trees were probably also managed through simple forms of arboriculture (Cowan 1985; Fritz 2000).

A discussion of Lower Mississippi Valley subsistence in this time period seems incomplete without addressing the beginnings of maize agriculture. Maize becomes an important dietary component for Mississippian cultures circa AD 900-1200 (Fritz 1995). Given the spatial and temporal proximity of Coles Creek to Mississippian cultures, it may seem surprising that Coles Creek societies did not adopt large-scale maize agriculture. They were certainly aware of its existence, and some settlements used it in small quantities, but it was not until the later Plaquemine period that people in the Lower Mississippi Valley would have utilized maize as a staple food (Fritz 1995). Evidence of maize has been recovered from

Fritz and Kidder's excavations of Coles Creek period settlements in Tensas Parish, Louisiana. The small amounts found, however, do not suggest that they were practicing large-scale maize agriculture (Fritz and Kidder 1993). Fritz proposes that maize may have had ritual importance, especially to high status individuals, and could have been used for events such as feasting (Fritz 1995).

Increasing flotation rates in the region will be a key step toward gaining more insight into Coles Creek subsistence patterns and the transition to agriculture in subsequent periods. More archaeological research must be done in order to better understand the intricacies of Coles Creek hunter-gatherer lifestyles, as Fritz and Kidder note:

> We know of no well developed models attempting to elucidate the ecological and social dynamics of nonagricultural food procurement and distribution given the parameters of Coles Creek political complexity, population density, and settlement patterning in an inland (noncoastal) delta [Fritz and Kidder 1993:10].

Based on archaeobotanical data that are available for Coles Creek settlements, however, it seems that these cultures carried on certain subsistence traditions even when maize agriculture and other domesticates were available to them. Since it is during this period that major social and economic transitions were taking place throughout the Lower Mississippi Valley, it becomes important to understand how subsistence practices functioned within various Coles Creek contexts.

THE FELTUS MOUNDS SITE

The Feltus site is located about 24 km north of the town of Natchez, in Jefferson County, Mississippi. It is an early Coles Creek period mound site that dates from approximately AD 700 to 1000. Originally the site was composed of four earthen mounds (labeled A-D) positioned around a central plaza; today, however, only mounds A, B, and C remain (Figure 1).

The site is situated in the Natchez Bluffs region of the Lower Mississippi Valley (Figure 2). These loess bluffs contain a very fertile, silty loam, which is “one of the most productive soil groups in the world” (Brain 1978:334). The soil composition combined with ample annual rainfall (127-152 cm) allows the region to support a large variety of plant and animal species (Brain 1978). Moderate temperatures and long frost-free periods are also integral to the region’s extended growing period (Fritz 2000).

Excavations

Originally known as the Ferguson mounds, the Feltus site was first excavated in 1846 by Montroville W. Dickeson (Culin 1900), and visited again in 1924 by Warren K. Moorehead (Moorehead 1932). The site was renamed Feltus during the 1971 excavations of the Lower Mississippi Survey (Lower Mississippi Survey 1971).

The University of North Carolina’s Research Laboratories of Archaeology (RLA) conducted field school excavations at the site from August to December of 2006. The project was directed by Dr. Vincas Steponaitis of the RLA and John O’Hear of Mississippi State University’s Cobb Institute of Archaeology. The purpose of the project was to date the site, as well as to develop an understanding of the construction history of the mounds. Excavation units were placed in the seven following areas: (1) Mound A, summit; (2) Mound A, east slope; (3) Mound A, southeast flank; (4) Mound B, summit; (5) Mound B, west slope; (6) Mound C, east slope; (7) Plaza, south end (Kassabaum 2006).

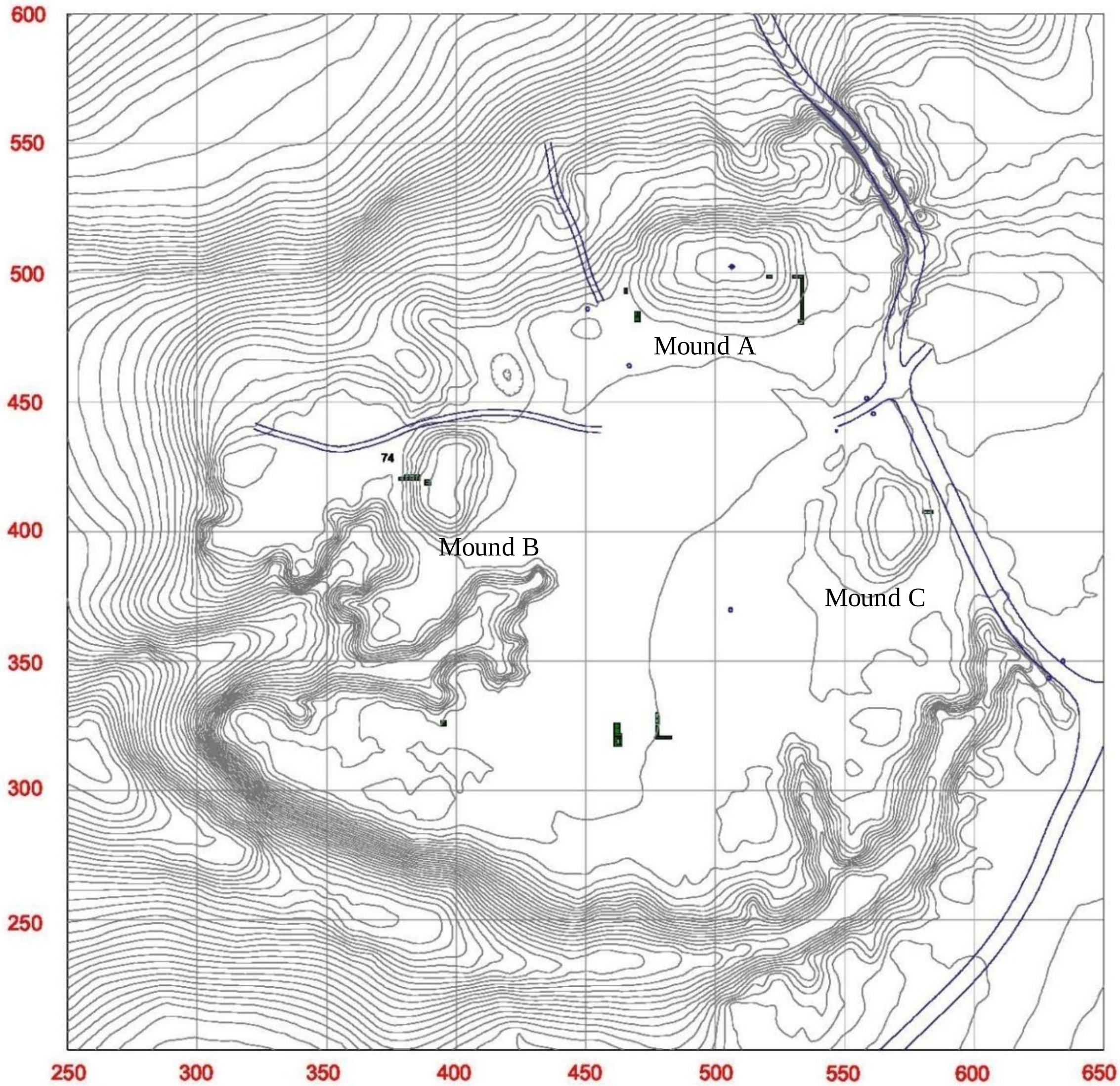

Figure 1. Map of Feltus Mounds showing excavation units from 2006 and 2007.

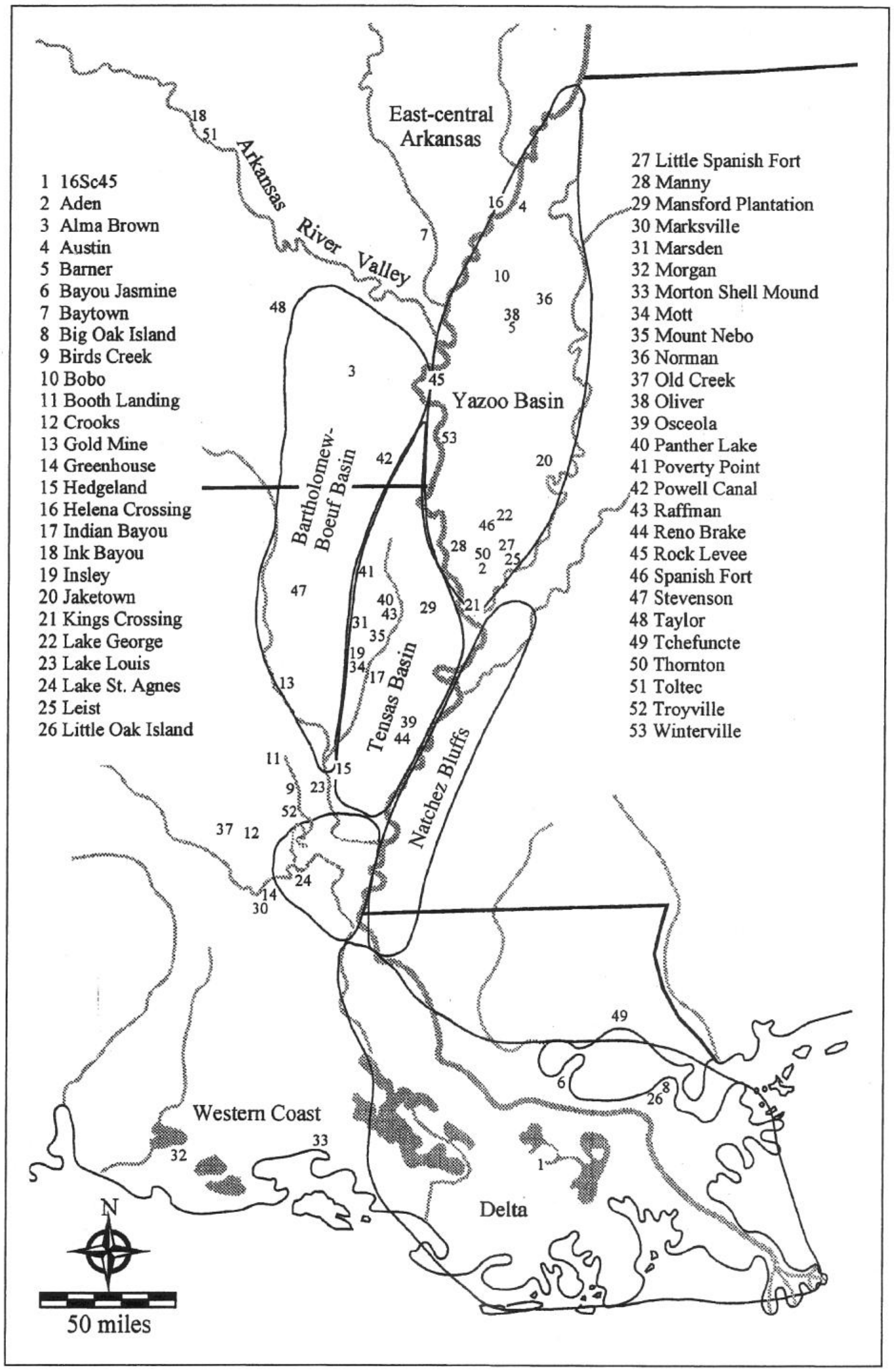

Figure 2. Regional map of the Lower Mississippi Valley, showing major sites and geographical subdivisions (Kidder 2002; Figure 4.1)

The RLA returned to the site during the same period of time in 2007 for another field season. New units were placed in the plaza, and on mounds A and B. Whereas the previous year's research was focused mainly on the mounds, excavations in 2007 concentrated more on off-mound contexts, especially the plaza. For the locations of the excavation units of both years, refer to Figure 1.

My study focuses on selected flotation samples from the plaza, Mound A, and Mound B (Table 1). All plaza samples analyzed for this study originated from Feature 4, a large midden-filled pit feature in the southern end of the plaza. Prior to excavation, magnetometer readings showed Feature 4 as a large magnetic anomaly. A small portion of the pit feature was excavated during the 2006 field season. The pit was then completely bisected by a trench in 2007. During excavation of this trench, a control block was left in place until all surrounding areas were excavated, thus decreasing the risk of mixing stratigraphic contexts. It appeared that the pit was deposited and covered rapidly.

The Mound A samples I analyzed were all from a sub-mound midden deposit on the eastern slope of the mound. Excavations of this midden began in 2006 with two separate units: one on the eastern slope, and another on the southeastern flank of the mound. In 2007, a trench connecting the two units was excavated. In all units, the same sub-mound midden was reached. Thus, all samples from Mound A originate from the same midden deposit. Numerous ashy postholes were located in the midden. The deposit was later capped with mound fill as construction of the mound continued.

Table 1. Provenience of flotation samples from Feltus Mounds.

Catalog Number	Unit	Level	Feature	Sample Vol. (l)	Plant Wt. (g)[1]	Wood Wt. (g)[2]
516/507	Plaza, S	4	4		13.40	11.91
475/480	Plaza, S	5	4	10	10.03	9.47
1410/1409	Plaza, S Control Block	Zone A, N ½	4	10	2.19	2.09
1294/1293	Plaza, S Control Block	Zone A2	4	10	5.02	3.94
1377*	Plaza, S Control Block	Zone B, S ½	4		3.41	3.39
1379/1378	Plaza, S Control Block	Zone C, S ½	4	10	15.63	15.00
1381/1382	Plaza, S Control Block	2, Zone C	4	10	24.01	22.89
1384*	Plaza, S Control Block	3, Zone C	4	10	8.67	8.64
1451/1471	Plaza, S Control Block	Zone D, N ½	4	10	6.79	6.03
1414/1415	Plaza, S Control Block	Zone D, S ½	4	10	16.74	15.53
1417/1416	Plaza, S Control Block	Zone E, S ½	4	10	1.36	1.09
196/178	Mound A, SE	3		10	7.41	6.69
171/170	Mound A, SE	4B	1A		9.15	9.10
190/169	Mound A, E	6			3.87	3.79
1232/1231	Mound A, Trench	2, Zone C			22.83	22.68
318/317	Mound B, Summit	Zone D, W ½			0.05	0.05
447*	Mound B, Summit	Zone F	Charcoal deposit	3	15.40	15.38
474/482	Mound B, Summit		3, S ½		0.33	0.32
186/179	Mound B, Summit	9			0.16	0.16

*Heavy fractions were not available for analysis.

[1] Plant weight refers to the weight of all plant remains from a sample, including wood charcoal, seeds, and nutshell.
[2] Wood weight refers to the weight of wood charcoal from a sample.

The samples analyzed from Mound B were the only samples for this study that were not taken from midden contexts. Instead the samples were taken from four contexts in the summit unit: a charcoal deposit, a burnt hearth, a burnt living floor, and another burnt layer of clayey silt, which was either a burnt hearth or floor.

Ceramic analysis has determined that Feltus dates from AD 700 to 850, making it part of the Ballina phase of the early Coles Creek period. These dates were further confirmed by a radiocarbon date of circa AD 780 (Steponaitis, personal communication, 2008).

METHODOLOGY

Sampling

Plant remains may be recovered from their archaeological contexts through *in situ* collection, dry and/or water screening, and flotation (Pearsall 2000). At the Feltus site, only flotation was utilized as a recovery method for botanical remains. As a result, all samples for this study were recovered by flotation.

In the interest of time (both in the field and in the laboratory), it is common to use smaller, representative samples for flotation, while the bulk of material from a site is usually screened (Wagner 1988). Flotation samples were taken from excavations on mounds A and B, and in the south end of the plaza. Samples were systematically taken from midden deposits, features (such as hearths and pits), and post holes; mound fill that was determined to be largely sterile was not sampled for flotation. Normally, samples of 10 liters were taken from middens and large features, while small features and post holes were recovered in their entirety for flotation.

Due to time limitations, it was not possible to analyze all of the flotation samples recovered from the Feltus site. Therefore, a few samples from each main context were selected for analysis. Samples from Mound A and the plaza were chosen to gain insight into the contents of refuse deposits, while Mound B samples were focused on mound summit activities. In all, 19 samples from the three contexts were used for this study.

Recovery

Flotation is specifically designed to recover charred botanical remains. Carbonized remains are separated from the surrounding soil matrix of the sample through the use of water. After the matrix is dissolved, two separate portions of the sample remain: the light fraction (which is composed of material light enough to float), and the heavy fraction (which sinks to the bottom).

All flotation samples from Feltus were processed using a modified, machine-assisted SMAP flotation system (see Watson 1976). Machine-assisted (or mechanized) systems use a spray of water against a screen-bottomed container, which washes the light fraction into a separate, fine-screen container (Wagner 1988, Pearsall 2000). The system used at Feltus had 1.5 mm mesh in the heavy fraction box, and 0.5 mm in the light fraction. The surface of the water in the heavy fraction box was skimmed by hand with fine-screen strainers, in order to capture any floating remains that were not washed into the light fraction box. The flotation tank, which was operated with freshwater, was drained and thoroughly rinsed between samples. After the flotation process, the heavy fraction was transferred to window screen to dry. The light fraction was carefully rinsed onto pieces of muslin cloth, so as to minimize the loss of small seeds. After drying, samples were stored in plastic bags. Heavy and light fractions were given separate catalog numbers. I supervised all flotation during the 2006 field season.

Plant preservation biases

Several factors can influence and subsequently bias the preservation of plant remains in the archaeological record. To begin with, the way in which plants are processed affects whether or not seeds are intact during deposition. Activities such as crushing and grinding, for instance, may lead to underrepresentation. In addition, environments like the Lower Mississippi Valley require that plant remains be carbonized in order to be preserved in archaeological contexts. Thus, seeds and other remains must be burned, but not to the point of being reduced to ash. Differences in plant remain composition also influence preservation- thicker, denser remains like nutshell are more likely to be preserved than smaller, more fragile seeds. While all of these biases cannot be compensated for, it is still likely that the more a plant was used, the more it will appear in the archaeological record (Yarnell 1982).

Laboratory methods

I analyzed the samples from Feltus at the Paleoethnobotany Laboratory of the RLA, under the direction of Dr. C. Margaret Scarry. All samples were hand-sorted. The laboratory methods used were derived from standard procedures for the analysis of botanical remains, as detailed by Pearsall (2000).

First, each sample was weighed, and its weight recorded in grams. Samples were then sifted through a series of three geological sieves measuring 2 mm, 1.4 mm, and 0.71 mm. Material in the 2 mm and 1.4 mm sieves were completely sorted into categories of wood, seeds, and nutshell. For the purposes of this project, all remaining material, including bone, rocks, and modern plant matter, was classified as contaminant. Contaminant was weighed, and then discarded. Smaller material from the 0.71 mm sieve and the bottom pan was not sorted, but rather scanned only for seeds. After seeds were removed, the remaining material was weighed and bagged as residue. Seeds and nutshell were identified to the greatest extent possible using identification guides such as martin and Berkley (1961) and the reference collection at the RLA. Wood species were not identified. All identifications were verified by Scarry.

For this project, both heavy and light fractions were analyzed. This is due to the fact that heavier specimens, such as nutshell, are often found in the heavy fraction, and some small seeds, like purslane, may sink when they become waterlogged (Wagner 1988). Furthermore, dense, clayey soils often found in the Southeast can keep some remains from floating into the light fraction.

Quantitative methods

In order to effectively interpret and compare results, it is necessary to use properly quantified data. In this study, wood is represented by weight, while nutshell and seeds are represented by both weights and counts. For the comparisons, however, I focus on the count data because many of the seeds weighed less than the 0.01 resolution of the lab scale.

Since absolute (raw) counts may be subject to biases, they "rarely provide an adequate measurement for archaeobotanical remains" (Popper 1988:61). Instead, data must be standardized so that meaningful interpretations and comparisons can be made.

Paleoethnobotanists employ a variety of methods to make data from different samples and sites comparable.

Standardizing ratios can be used in several ways and help make comparisons among the following:

> …(1) samples of unequal size, (2) samples differing in circumstances of deposition or preservation, and (3) quantities of different categories of material that are equivalent in some respect [Miller 1988:72].

For my study, basic ratios expressed as standardized counts per gram of plant weight have been used. To convert data to standardized counts, the raw counts were divided by the total plant weight of a sample. After these conversions were made, it was possible to compare both intra- and inter-site data.

I also used percentages to show what portion of an assemblage each taxon or plant category represents. Percentages provide a straightforward way to compare the importance of one taxon to other taxa, across different samples (Miller 1988). Percentages may be misleading, however, because as the count of one taxon increases or decreases, other taxa are inversely affected. Consequently, percentages cannot be independently evaluated. While a useful statistic, percentages must be considered carefully in order to most accurately interpret data.

More complex analysis of the data was conducted through correspondence analysis (CA). For this study, the CA was performed by Vincas Steponaitis through the use of Stata, a statistical computer software program. Four separate CA graphs were generated: two showing the relationship of contexts within Feltus, and two showing the relationship of Feltus to three other Coles Creek sites. Essentially, CA uses contingency tables to find patterned relationships among variables. By calculating mathematical relationships among raw data counts, CA is expressed by data points on a biplot graph. Relationships between data points are illustrated by their relative positions on the graph. For instance, a site with CA graph coordinates near the point for acorns would have a higher frequency of acorns, while a site farther away from that point would have fewer acorns. CA makes it possible to identify patterns, which may not be evident by simply looking at the tabulated data.

DISCUSSION OF FREQUENTLY OCCURRING TAXA

To better understand the role of any particular plant resource, it is helpful to examine that resource in the context of its broader plant category. Each resource at Feltus has been placed into one of the following categories: acorns, other nuts, starchy and oily seeds, fruits, miscellaneous, and unidentified/unidentifiable (Table 2).

Acorns

Acorn shell and acorn nutmeat are being considered separately from other nuts because of their unique starchy quality. Acorns were an important source of carbohydrates in ancient North American diets, even after the introduction of maize (Scarry 2003). Fritz suggests that they could have been "gathered from intensively managed, orchard-like groves, where use rights were strictly enforced" (Fritz 1998)

Other nuts

This category includes hickory, thin shell hickory/pecan, and walnut. Cowan identifies nutshell as the most common component of paleoethnobotanical samples from 7000 BC until the rise of field agriculture (1985:218). These nuts contain fat and protein, and

Table 2. Plants identified from Feltus Mounds.

	Common Name	Taxonomic Name	Item Type	Season
Acorns	Acorn shell	*Quercus* sp.	Nutshell	Fall
	Acorn meat	*Quercus* sp.	Nutmeat	Fall
Other Nuts	Thick-shell hickory	*Carya* sp.	Nutshell	Fall
	Thin-shell hickory/Pecan	*Carya* sp./*Carya illoenensis*	Nutshell	Fall
	Walnut	*Juglans nigra*	Nutshell	Fall
Starchy and Oily Seeds	Amaranth	*Amaranthus* sp.	Seed	Late summer/fall
	Chenopod	*Chenopodium berlandieri*	Seed	Late summer/fall
	Cheno-am.	*Chenopodium/Amaranthus* sp.	Seed	Late summer/fall
	Cucurbit rind	Cucurbitaceae	Rind	Mid-summer/fall
	Erect knotweed	*Polygonum erectum*	Seed	Late summer/fall
	Maygrass	*Phalaris caroliniana*	Seed	Spring/early summer
	Smartweed	*Polygonum cf. pennslyvanicum*	Seed	Late summer/fall
	Sumpweed	*Iva annua*	Seed	Late summer/fall
Fruits	Blackberry/Raspberry	*Rubus* sp.	Seed	Mid-late summer
	Cabbage palm	*Sabal* sp.	Seed	Fall
	Elderberry	*Sambucus* sp.	Seed	Late summer/fall
	Grape	*Vitis* sp.	Seed	Mid-summer/fall
	Hackberry	*Celtis* sp.	Seed	Fall/winter
	Maypop	*Passiflora incarnata*	Seed	Mid-summer/fall
	Persimmon	*Diospyros virginiana*	Seed	Fall
Miscellaneous	Bedstraw	*Galium* sp.	Seed	Summer
	Nightshade	*Solanum* sp.	Seed	Summer/fall
	Pokeweed	*Phytolacca americana*	Seed	Spring/summer
	Purslane	*Portulaca oleracea*	Seed	Spring/fall
Unidentified	Unidentified grass	Poaceae	Seed	
	Unidentified seed		Seed	
	Unidentifiable		Seed	

are considered to be high-energy foods (Scarry 2003). The nutmeats of thick-shell hickories are difficult and time-consuming to extract, and thus the nuts were often crushed in order to render oil. Pecans would have been cracked and the nutmeat extracted by hand, however, because of the woody septum which divides the nutmeats (Scarry 2003). Due to similarities between thin-shell hickory and pecan, it can be difficult to distinguish one from the other; for this reason, identifications have only been made as thin-shell hickory/pecan.

Starchy and oily seeds

This category encompasses a number of plants, including the following, which were identified at Feltus: amaranth, chenopod, cucurbit, erect knotweed, maygrass, smartweed, and sumpweed. As the name suggests, plants from this category are rich in starches or oils and were an important dietary component. They are indigenous, weedy species which mainly prefer open, disturbed habitats (Smith and Cowan 2003). Due to this characteristic, the plants are perfectly suited to thrive in areas of human occupation. These plants have a long history of cultivation and domestication by prehistoric Southeastern populations (Scarry and Yarnell 2006). The seeds recovered from Feltus appear to be from wild or cultivated species, but are not clear domesticates.

Fruits

Even though fruit seeds are less common in Feltus assemblages than nutshell or starchy and oily seeds, it is still likely that fruits were a major part of the Coles Creek diet. The fruit category consists of fleshy fruits and berries such as blackberry/raspberry, cabbage palm, elderberry, grape, hackberry, maypop, and persimmon. These fruits are all wild, but prehistoric populations could have made efforts to manage and encourage growth of these resources (Fritz 2000). Simple forms of arboriculture, such as weeding around young trees, could have been in place to protect fruit trees (Cowan 1985). Some fruit trees, like persimmon, also prefer disturbed habitats—therefore the increased appearance of persimmon late in the prehistoric archaeological record could be an indicator of increased land disturbance by Late Woodland and Mississippian peoples (Cowan 1985).

Miscellaneous

Bedstraw, nightshade, pokeweed, and purslane make up the miscellaneous seed category from Feltus. This category was designed as a catchall for seeds that did not fit into the other main categories, but also includes nightshade and pokeweed because it is likely that these plants had medicinal rather than dietary uses (Scarry, personal communication, 2008).

Unidentified

Seeds and seed fragments that were not positively identified have been placed into this category. Unidentified seeds have simply not been identified at this time, but future identification may be possible. Unidentifiable seeds, on the other hand, are often fragmentary or badly damaged and lack diagnostic characteristics--no identification is possible.

SUMMARY OF DATA

In all, I analyzed 19 samples from the plaza, Mound A, and Mound B at the Feltus site. Samples from the plaza and Mound A derived from midden contexts, while the samples from Mound B came from burned surfaces and features on the summit of the mound. Since only the plaza and Mound A contexts are analogous to one another, and since these contexts are where the vast majority of remains were found, the intrasite comparisons focus on these samples.

Tables 3 through 6 present standardized counts and percentages for plants identified in the assemblages from Feltus (also see Figures 3 and 4). Both the standardized counts and percentages are presented by taxa (Tables 3 and 5) and by plant category (Tables 4 and 6). Based on standardized counts, acorn is the most commonly occurring taxon in both the plaza and Mound A. Thick-shelled hickory seems to have also been an important resource, though relative amounts differ between contexts. Of the starchy and oily seeds, maygrass, erect knotweed, and chenopod are the most prevalent. Fruits are the least common plant category, but a variety of fruit seeds are consistently present in the samples. It is important to note that no maize has been recovered from Feltus. This contrasts with Fritz's findings of maize at later period Coles Creek sites in the Tensas Basin.

Plaza

I analyzed 11 samples from the plaza, all of which were from Feature 4. Two of the samples were collected during 2006 excavations. The remaining nine are from the control block in Feature 4, excavated in 2007. The samples contain diverse plant remains from all six of the plant categories identified at Feltus. The plaza samples are dominated by acorn and thick-shell hickory, which is reflected in the graphs of both standardized counts and percentages (Figures 3 and 4). Only small amounts of thin-shell hickory/pecan and walnut were found. Starchy and oily seeds are the third most common plant category behind acorns and other nuts. Maygrass, chenopod, and amaranth seeds had the highest standardized counts

Table 3. Standardized counts of plant remains from Feltus Mounds (by taxa).

	Plant Taxa	Plaza	Mound A	Mound B
Acorns	Acorn shell	5.35	2.22	0.06
	Acorn meat	0.04	0	0
Other Nuts	Thick-shell hickory	4.52	1.02	0.06
	Thin-shell hickory/Pecan	0.16	0.16	0
	Walnut	0.16	0.09	0
Starchy and Oily Seeds	Amaranth	0.49	0.02	0
	Chenopod	0.82	0.72	6.90
	Cheno-am.	0.12	0	0
	Cucurbit rind	0	0.21	0
	Erect knotweed	0.17	0.62	0.25
	Maygrass	1.02	0.42	0
	Smartweed	0.01	0.05	0
	Sumpweed	0.11	0.09	0.06
Fruits	Blackberry/Raspberry	0.03	0.02	0
	Cabbage Palm	0.01	0.28	0
	Elderberry	0.01	0	0
	Grape	0.36	0.05	0
	Hackberry	0.01	0	0
	Maypop	0.01	0.02	0
	Persimmon	0.05	0.07	0
Miscellaneous	Bedstraw	0	0.07	0
	Nightshade	0.01	0.02	0
	Pokeweed	0.14	0	0
	Purslane	1.16	0	0
Unidentified	Unidentified grass	0.01	0.21	0.50
	Unidentified seed	0.21	0.53	0.31
	Unidentifiable	0.52	0.28	0

Table 4. Standardized counts of plant remains at Feltus Mounds (by plant category).

Plant Category	Plaza	Mound A	Mound B
Acorns	5.39	2.22	0.06
Other nuts	4.84	1.27	0.06
Starchy and oily seeds	2.74	2.13	7.21
Fruits	0.48	0.44	0
Miscellaneous	1.32	0.30	0.50
Unidentified	0.73	0.81	0.31

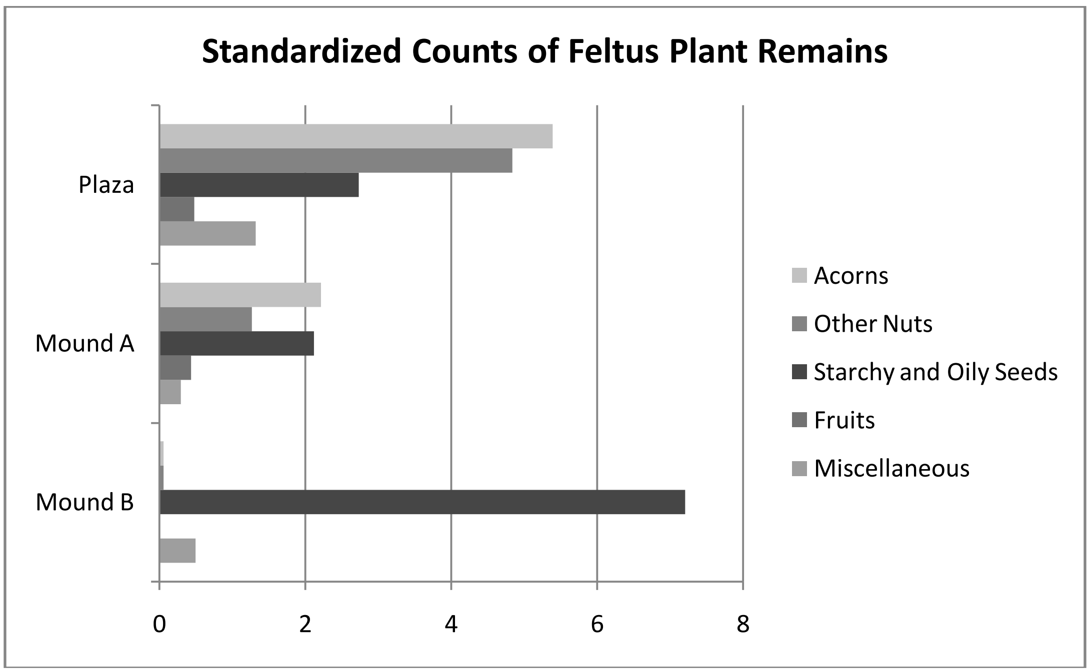

Figure 3. Graph of Feltus Mounds standardized counts.

Table 5. Feltus plant remain percentages by assemblage, based on count data (by taxa).

	Plant Taxa	**Plaza (raw ct.)**	**Plaza (%)**	**Mound A (raw ct.)**	**Mound A (%)**	**Mound B (raw ct.)**	**Mound B (%)**
Acorns	Acorn shell	535	34.52	96	30.97	1	0.77
	Acorn meat	4	0.26	0	0	0	0
Other Nuts	Thick-shell hickory	452	29.16	44	14.19	1	0.77
	Thin-shell hickory/Pecan	16	1.03	7	2.26	0	0
	Walnut	16	1.03	4	1.29	0	0
Starchy and Oily Seeds	Amaranth	49	3.16	1	0.32	0	0
	Chenopod	82	5.29	31	10.00	110	84.62
	Cheno-am.	12	0.77	0	0	0	0
	Cucurbit rind	0	0	9	2.90	0	0
	Erect knotweed	17	1.10	27	8.71	4	3.08
	Maygrass	102	6.58	18	5.81	0	0
	Smartweed	1	0.06	2	0.65	0	0
	Sumpweed	11	0.71	4	1.29	1	0.77
Fruits	Blackberry/Raspberry	3	0.19	1	0.32	0	0
	Cabbage Palm	1	0.06	12	3.87	0	0
	Elderberry	1	0.06	0	0	0	0
	Grape	36	2.32	2	0.65	0	0
	Hackberry	1	0.06	0	0	0	0
	Maypop	1	0.06	1	0.32	0	0
	Persimmon	5	0.32	3	0.97	0	0
Miscellaneous	Bedstraw	0	0	3	0.97	0	0
	Nightshade	1	0.06	1	0.32	0	0
	Pokeweed	14	0.90	0	0	0	0
	Purslane	116	7.48	0	0	0	0
Unidentified	Unidentified grass	1	0.06	9	2.90	8	6.15
	Unidentified seed	21	1.35	23	7.42	5	3.85
	Unidentifiable	52	3.35	12	3.87	0	0

Table 6. Feltus plant remain percentages by assemblage, based on count data (by plant category)

Plant Category	Plaza (raw ct.)	Plaza (%)	Mound A (raw ct.)	Mound A (%)	Mound B (raw ct)	Mound B (%)
Acorns	539	34.77	96	30.97	1	0.77
Nuts	484	31.23	55	17.74	1	0.77
Starchy and Oily Seeds	274	17.68	92	29.68	115	88.46
Fruits	48	3.10	19	6.13	0	0
Miscellaneous	132	8.52	13	4.19	8	6.15
Unidentified	73	4.71	35	11.29	5	3.85

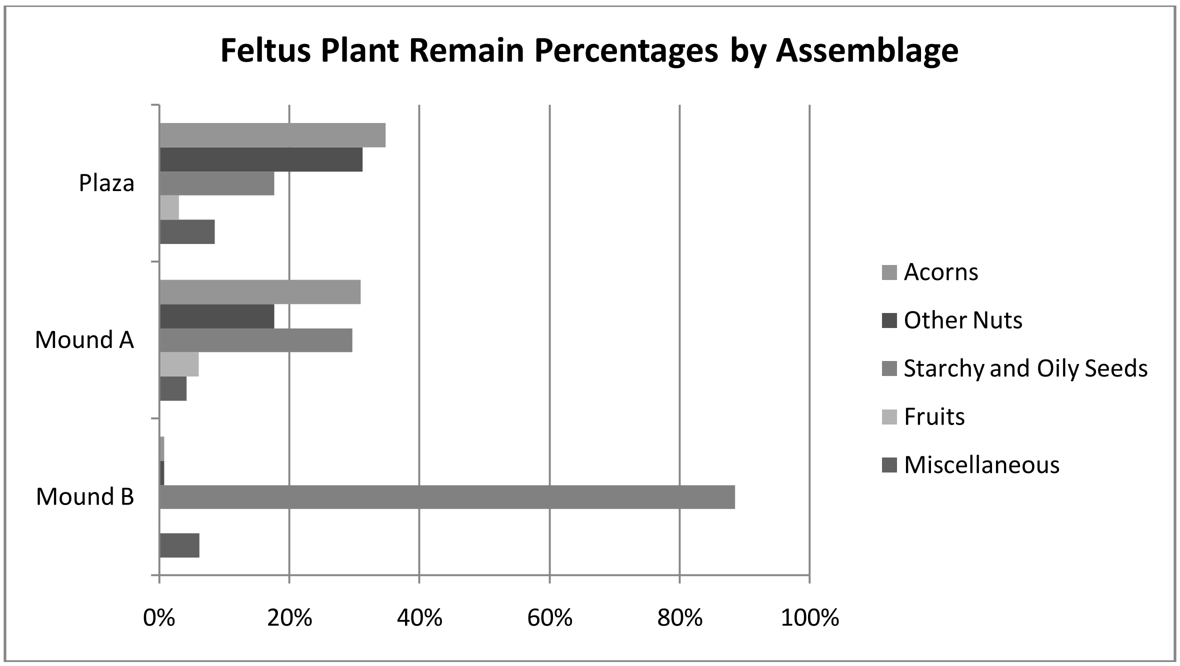

Figure 4. Graph of Feltus percentages.

from this group (Table 3). Far smaller amounts were found of erect knotweed, sumpweed, and smartweed. Seven different fruits were identified from plaza samples: cabbage palm, elderberry, grape, hackberry, maypop, and persimmon. Of these, grapes were by far the most abundant. In fact, more grape seeds were found in the plaza than anywhere else in the site, which is shown in the table of standardized counts. The plaza also contained a few miscellaneous seed types, most notably bedstraw, purslane, and pokeweed, which were not found in any mound samples.

The plaza pit feature may contain refuse from a relatively short-term, distinctive event. The notable frequency of acorns and nuts in the plaza could be an indicator that this event took place during the fall. This being the case, the plaza samples would be more representative of taxa available during the fall months of the year, whereas deposits made over longer periods of time may represent plants used over the course of the entire year.

Mound A

Acorn and thick-shelled hickory are the most abundant plant remains from Mound A samples. The standardized counts of starchy and oily seeds, however, almost equal that of acorn (Table 4). Chenopod, cucurbit rind, erect knotweed, and maygrass, were the principal components of this category. Fruits occurred with less frequency than acorns, nuts, or starchy/oily seeds, as is shown in the graph of standardized counts (Figure 3). Cabbage palm is the most frequently occurring fruit remain from Mound A, although brambles (blackberry/raspberry), grape, maypop, and persimmon were also identified in small numbers.

Mound B

The four samples analyzed from Mound B returned relatively few plant remains. Acorn and thick-shell hickory were the only nutshell found, and those occurred in very small amounts (Table 3). As standardized counts reveal, very high numbers of chenopod seeds were recovered. These seeds occurred in two separate samples: a burnt hearth, and a possible burnt floor. Chenopod seeds far outnumber any other plant remains at Mound B and comprise almost 85% of the Mound B assemblage (Figure 4). Also in the starchy and oily seed category, erect knotweed, sumpweed, and grass seeds were found. No fruits were present.

Due to fundamental differences in context, as well as the low number of remains found, Mound B is not easily compared to Mound A or the plaza. These summit samples are still important in examining varying contexts throughout the site, rather than simply refuse deposits. The low frequency of remains is somewhat to be expected, though, since hearths and floors are often cleaned, leaving sparse deposits.

Intrasite comparisons

Generally, the same range of plants can be found throughout the Feltus site, but patterns can be identified in the three assemblages. To begin with, the CA graphs from Feltus clearly illustrate the prevalence of acorns and other nuts in the plaza (Figures 5 and 6). In both graphs, the plaza's coordinates are very close to those of acorn and other nuts (more specifically, thick-shell hickory). Acorn and nut totals in the plaza more than double the amounts found in Mound A, causing the Mound A point to be plotted farther away from the

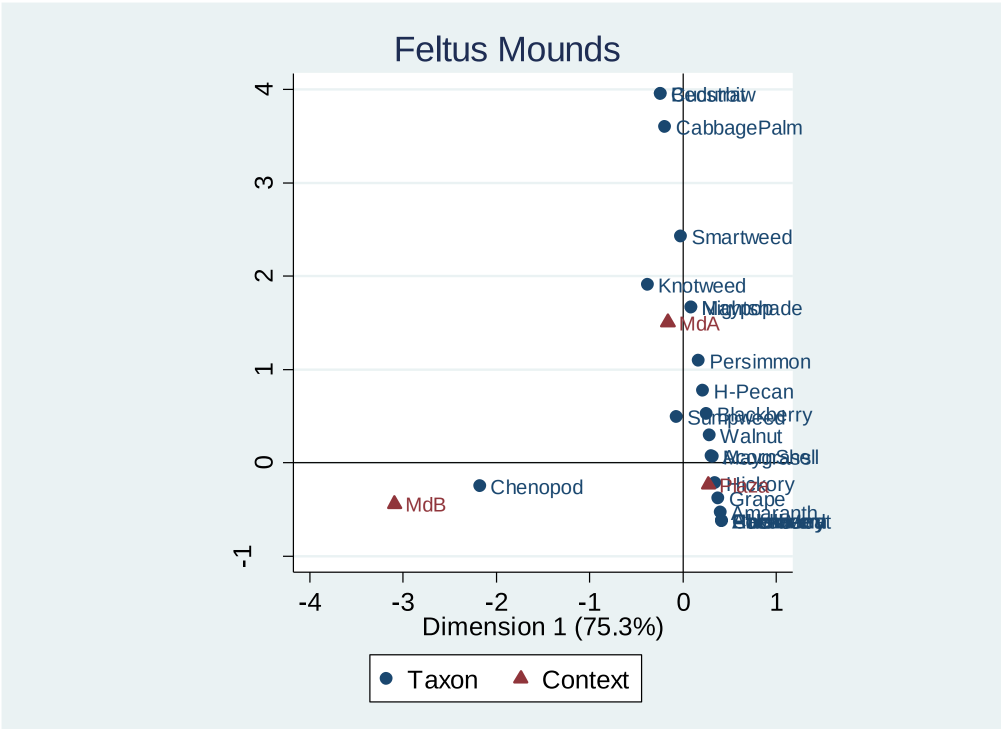

Figure 5. CA graph of Feltus plant remains (by taxa).

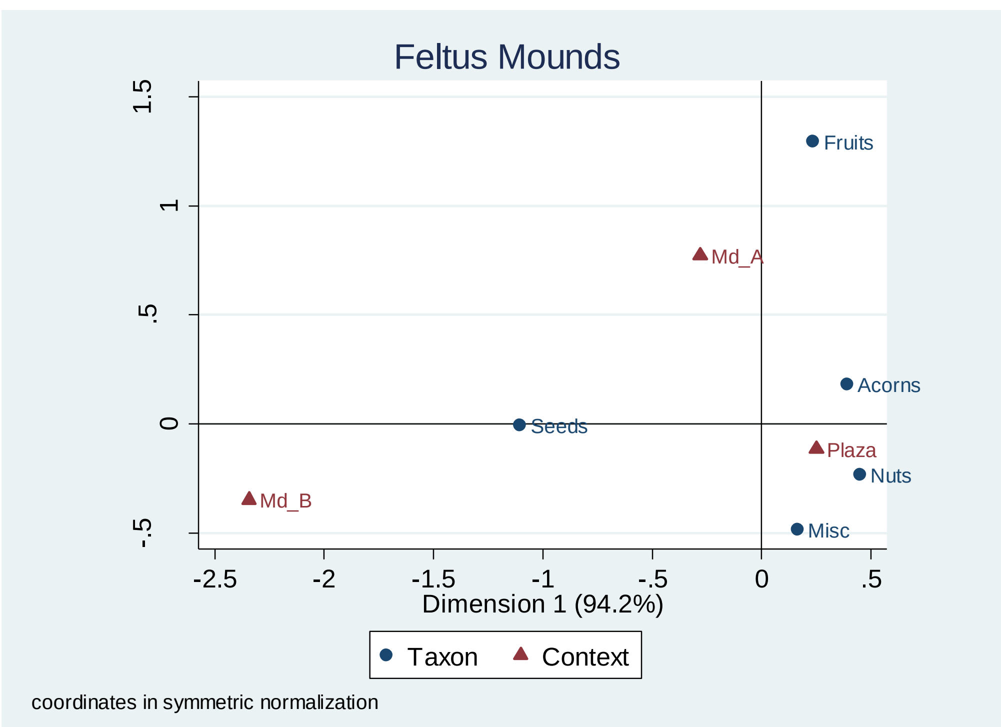

Figure 6. CA graph of Feltus plant remains (by plant category).

plaza's. The paucity of acorns or other nuts on Mound B causes the Mound B point to be the farthest away.

Mound B, on the other hand, has much larger amounts of starchy and oily seeds because of an abundance of chenopod. This is clearly illustrated by the CA graph that shows individual taxa (Figure 5), because the chenopod point is plotted closest to Mound B, and is an outlier appearing far to the left of the other taxa points. The same is true for the CA graph showing plant categories--the seeds point is pulled farther left, toward the center of the graph. The plaza and Mound A have comparable amounts of starchy and oily seeds, but far less chenopod than Mound B. Therefore, the points are plotted in line with the other starchy and oily seeds on the right side of the CA graph showing individual taxa.

Like starchy and oily seeds, fruit seeds occur in relatively comparable amounts in the plaza and in Mound A. The x-axis coordinates for Mound A and the plaza are near to that of the fruit category. Since Mound A samples, however, contained more cabbage palm, the Mound A point is drawn upward along the y-axis of the graph of individual taxa. The plaza, which contained much more grape, is located directly next to the grape point of the graph. No fruit was found on Mound B, so its graph point lies much farther to the left, away from the fruits and other contexts.

The plant assemblages from the plaza and Mound A are the most similar from the site. Most plant categories occurred in similar amounts in both contexts, with the exception of acorn and nuts, which were much more prevalent in the plaza. Mound B shows that while floor and hearth contexts are not as rich in plant remains as midden deposits, there is a great abundance of chenopod seeds. The standardized counts of chenopod seeds reveal that there is almost seven times more chenopod from Mound B than from either the plaza or Mound A. Fruits, however, are more common in samples from Mound A than from other contexts.

INTERREGIONAL COMPARISONS

Since variation in subsistence patterns among Coles Creek sites can be high, it is interesting to consider how the Feltus site compares with other contemporaneous Coles Creek sites. In order to gain a small glimpse as to what extent Feltus may fit regional patterns, the Feltus data used for this study were compared to data from three other roughly contemporaneous Coles Creek sites: Hedgeland, Lisa's Ridge, and Shackleford Lake. The data from these three sites were obtained through flotation samples, which were analyzed by Roberts (2006). Sorting methods used were roughly equivalent to those at Feltus. Samples from all three sites date to the Sundown phase (AD 750 to 850) of the Coles Creek period. The sites are located in northeast Louisiana in the Tensas River Basin (Figure 2), and all are situated atop natural levee formations (Roberts 2006). .

The Hedgeland site is a two mound site with a long period of occupation (circa AD 500 to AD 1400). It was probably a public site with civic or ceremonial function. For my study, only data from 29 samples dating to the Sundown phase (ca. AD 750 to 850) are considered (Roberts 2006).

Like Feltus, Shackleford Lake is a multiple mound site of ceremonial function, consisting of four mounds. Occupation is believed to have taken place between AD 650 and AD 900/1000 (Roberts 2006). Twenty samples dating to the Sundown phase (the primary phase of occupation) were analyzed by Roberts.

Lisa's Ridge is fundamentally different from Feltus and the other sites in that it is a non-mound site. It has been interpreted as a non-ceremonial habitation site, which is believed to have been occupied around AD 800/900 (Roberts 2006). Twenty samples were analyzed from Lisa's Ridge.

To compare Robert's data to those from Feltus, raw counts from each site assemblage were standardized (raw count divided by total plant weight). The data from Mound B at Feltus have not been included in these comparisons. If the data had been included, however, Feltus would have had a higher occurrence of starchy and oily seeds. Also, the various categories of stem identified by Roberts have not been considered for this study. All four sites have comparable sample numbers.

Tables 7 through 10 present standardized counts and percentages for the four sites by taxa and by category (also see Figures 7 and 8). Overall, the Hedgeland, Lisa's Ridge, and Shackleford Lake sites all contain significantly higher standardized counts of acorn than Feltus. Feltus generally has higher standardized counts of thick-shell hickory, while the three other sites have more thin-shell hickory/pecan. Differential laboratory methods, however, might play a role in the difference of hickory shell counts. Hickory shell from Feltus was sorted from both the 2 mm and 1.4 mm size-fractions, whereas Roberts only sorted hickory from the 2 mm size-fraction (all other laboratory procedures are equivalent). While this may increase counts of thin and thick-shell hickory at Feltus, it does not affect the relative proportions of the two types. More research would be necessary to determine what other impacts this difference in laboratory methods may have. Otherwise, similar taxa occur at all sites, just in differing frequencies.

Table 7. Interregional standardized counts (by taxa), continued on next page.

	Plant Taxa	Feltus	Hedgeland	Shackleford Lake	Lisa's Ridge
Acorns	Acorn shell	4.19	4.89	16.16	5.55
	Acorn meat	0.03	0.05	0	0.05
Other Nuts	Juglandaceae shell	0	0	0.14	0.03
	Thick-shell hickory	3.30	0	0	0
	Thin-shell hickory/Pecan	0.15	1.08	5.02	0.66
	Walnut	0.13	0	0	0
	Other nutshell	0	0	0	0.02
Starchy and Oily Seeds	Amaranth	0.33	0.01	0.32	0
	Chenopod	0.75	2.94	0.06	0.01
	Cheno-am	0.08	0	2.12	0.11
	Cucurbita/Laganaria sicerarira	0.06	0.02	0.12	0.01
	Echinochloa	0	1.67	0	0
	Erect knotweed	0.29	0.03	0.04	0.01
	Maygrass	0.80	0.36	1.66	0
	Smartweed	0.02	0	0	0
	Sumpweed	0.10	0	0.08	0.09
	Sunflower	0	0.05	0	0
Fruits	Blackberry/Raspberry	0.03	0.01	0.22	0
	Cabbage palm	0.09	0.19	1.66	0.17
	Elderberry	0.01	0	0	0
	Grape	0.25	0.16	0.04	0
	Hackberry	0.01	0	0	0
	Honey locust	0	0	0	0
	Maypop	0.01	0	0	0
	Persimmon	0.05	1.66	2.33	2.71
Miscellaneous	Bean family	0	0	0.24	0
	Bedstraw	0.02	0	0.20	0.03
	Composite family	0	0	0	0

	Grass family	0.07	0.01	0.06	0.02
	Mallow family	0	0.02	0	0
	Nightshade	0.01	0	0.04	0
	Pokeweed	0.09	0.03	0	0
	Purslane	0.77	0.02	0.63	0
	Verbena	0	0	0.04	0
Unidentified	Unidentified seed	0.29	0	1.66	0
	Unidentifiable seed	0.43	0.13	0	0.19
	Unknown plant	0	1.54	3.40	2.47

Table 8. Interregional standardized counts (by plant category).

Plant Category	Feltus	Hedgeland	Shackleford Lake	Lisa's Ridge
Acorns	4.22	4.94	16.16	5.59
Other nuts	3.58	1.08	5.16	0.72
Starchy and oily seeds	2.43	5.07	4.39	0.23
Fruits	0.45	2.02	4.25	2.89
Miscellaneous	0.96	0.08	1.21	0.06
Unidentified	0.72	1.67	5.06	2.65

Table 9. Interregional percentages (by taxa), continued on next page.

	Plant Taxa	Feltus (%)	Hedgeland (%)	Shackleford Lake (%)	Lisa's Ridge (%)
Acorns	Acorn shell	33.92	32.89	44.60	45.66
	Acorn meat	0.22	0.35	0	0.39
Other Nuts	Juglandaceae shell	0	0	0.38	0.28
	Thick-shell hickory	26.67	0	0	0
	Thin-shell hickory/Pecan	1.24	7.28	13.86	5.45
	Walnut	1.08	0	0	0
	Other nutshell	0	0	0	0.18
Starchy and Oily Seeds	Amaranth	2.69	0.04	0.87	0
	Chenopod	6.08	19.78	0.16	0.11
	Cheno-am	0.65	0	5.84	0.91
	Cucurbita/Laganaria sicerarira	0.48	0.15	0.33	0.11
	Echinochloa	0	11.26	0	0
	Erect knotweed	2.37	0.19	0.11	0.07
	Maygrass	6.45	2.40	4.59	0
	Smartweed	0.16	0	0	0
	Sumpweed	0.81	0	0.22	0.74
	Sunflower	0	0.31	0	0
Fruits	Blackberry/Raspberry	0.22	0.04	0.60	0
	Cabbage palm	0.70	1.28	4.59	1.41
	Elderberry	0.05	0	0	0
	Grape	2.04	1.08	0.11	0
	Hackberry	0.05	0	0	0
	Honey locust	0	0	0	0.04
	Maypop	0.11	0	0	0.04
	Persimmon	0.43	11.18	6.44	22.30
Miscellaneous	Bean family	0	0	0.66	0.04
	Bedstraw	0.16	0	0.55	0.25

	Composite family	0	0	0	0.04
	Grass family	0.54	0.08	0.16	0.18
	Mallow family	0	0.12	0	0
	Nightshade	0.11	0	0.11	0
	Pokeweed	0.75	0.19	0	0
	Purslane	6.24	0.15	2.00	0
	Verbena	0	0	0.11	0
Unidentified	Unidentified seed	2.37	0	4.59	0
	Unidentifiable seed	3.44	0.89	0	1.55
	Unknown plant	0	10.33	9.39	20.30

Table 10. Interregional percentages (by plant category).

Plant Category	Feltus	Hedgeland	Shackleford Lake	Lisa's Ridge
Acorns	36.24	37.45	51.84	58.91
Other nuts	30.76	8.20	16.56	7.56
Starchy and oily seeds	20.89	38.45	14.09	2.48
Fruits	3.82	15.30	13.64	30.42
Miscellaneous	8.28	0.61	3.87	0.63

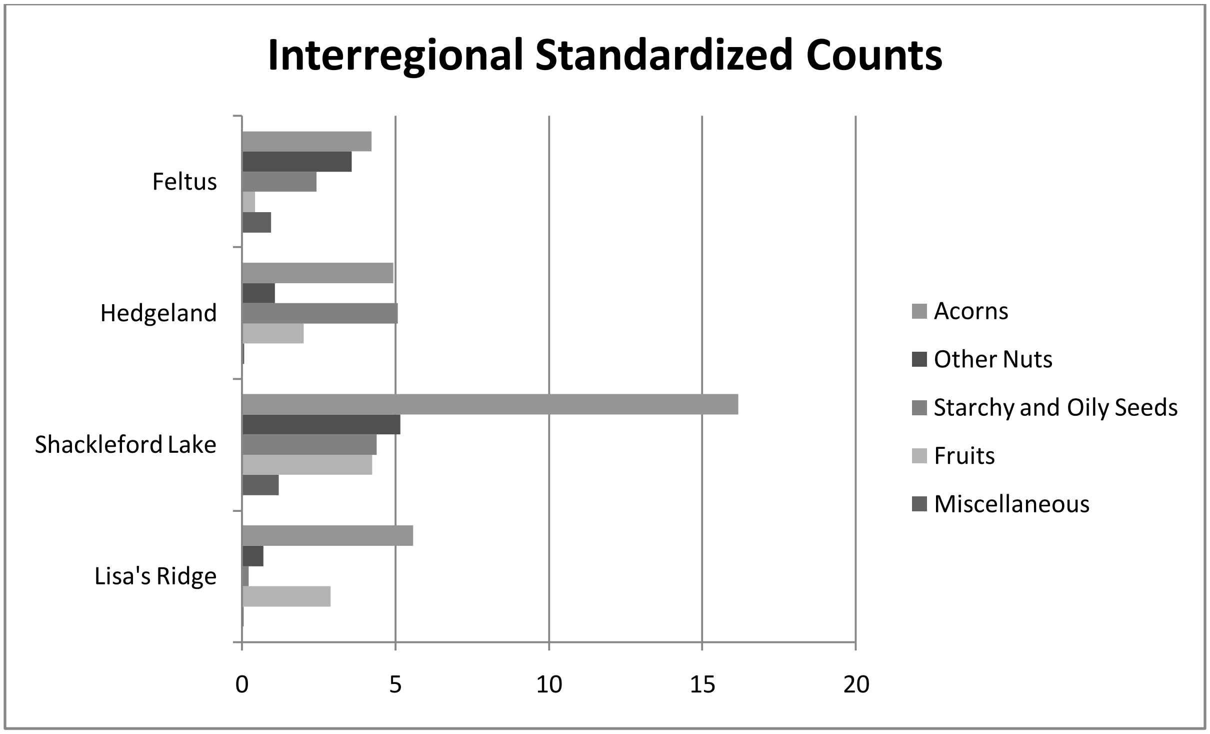

Figure7. Graph of interregional standardized counts.

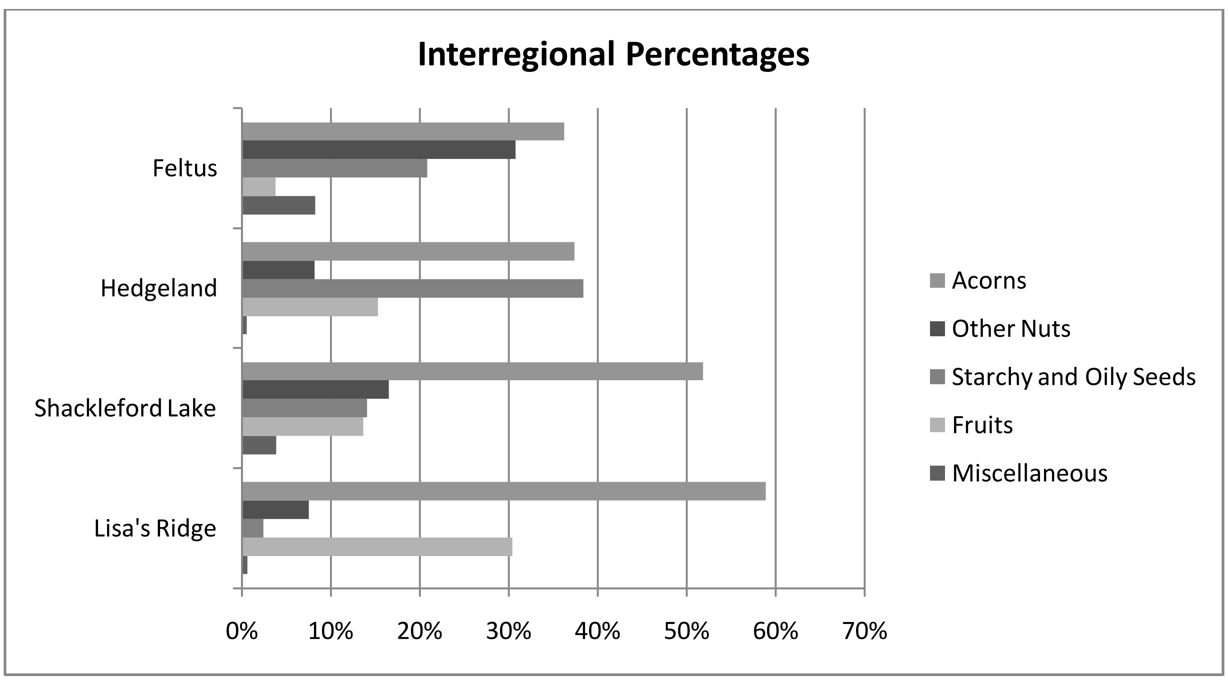

Figure 8. Graph of interregional percentages.

Hedgeland

Out of all four sites considered for this study, the Hedgeland site contained the highest proportion of starchy and oily seeds. Hedgeland was the only site in which starchy and oily seeds outnumbered any other plant category, including acorns. This was due to high numbers of chenopod and echinochloa seeds; maygrass followed a distant third. Hedgeland's uniquely large portion of starchy and oily seeds can be seen not only in graphs of standardized counts and percentages, but also in CA graphs (Figures 9 and10), where it is separated on the Dimension 2 (y) axis from the other sites. Acorn shell was only slightly less numerous than starchy and oily seeds, making these two groups account for 75% of the entire Hedgeland assemblage (not including unidentified remains).

Fruits at the Hedgeland site include blackberry/raspberry, cabbage palm, grape, and persimmon, though persimmon is by far the most abundant. This being the case, there is almost four and half times more fruit at Hedgeland than at Feltus. If the disproportionately high numbers of persimmon are taken out of the fruit category at Hedgeland, however, Feltus would have more fruit. In other words, where Hedgeland has abundant persimmon, Feltus has a more diverse array of fruits.

Shackleford Lake

Standardized counts reveal Shackleford Lake to have the highest amount of acorn out of all the sites, and almost quadruple the acorn remains found at Feltus. Aside from unusually high counts of acorn, the rest of the assemblage from Shackleford Lake is relatively well-balanced. Counts of other nuts, and starchy and oily seeds, while higher than those at Feltus, appear in relatively comparable proportions to those at Feltus. If persimmon is removed, the

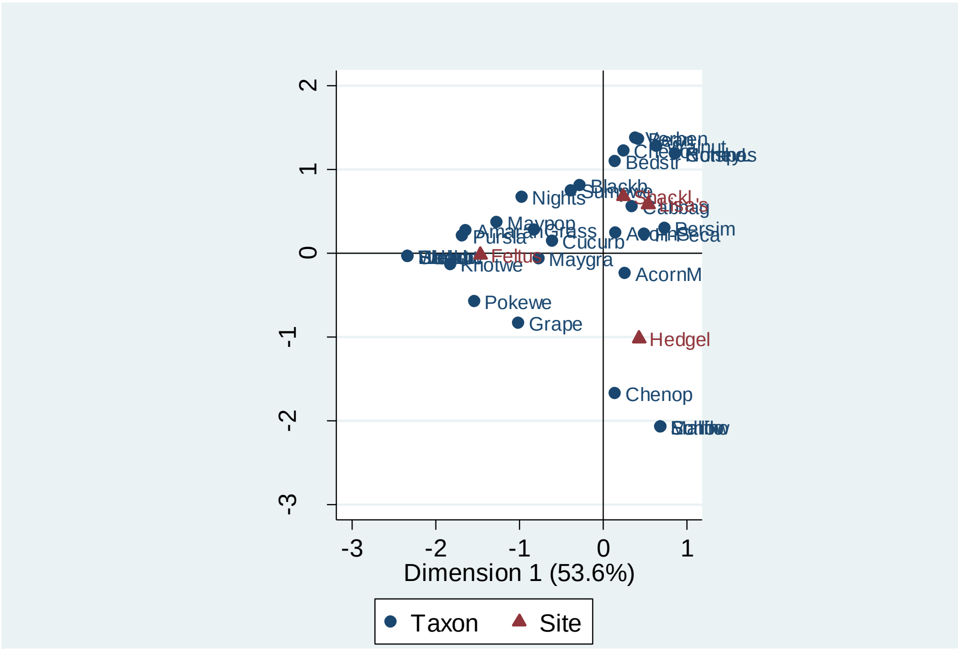

Figure 9. Interregional CA graph (by taxa).

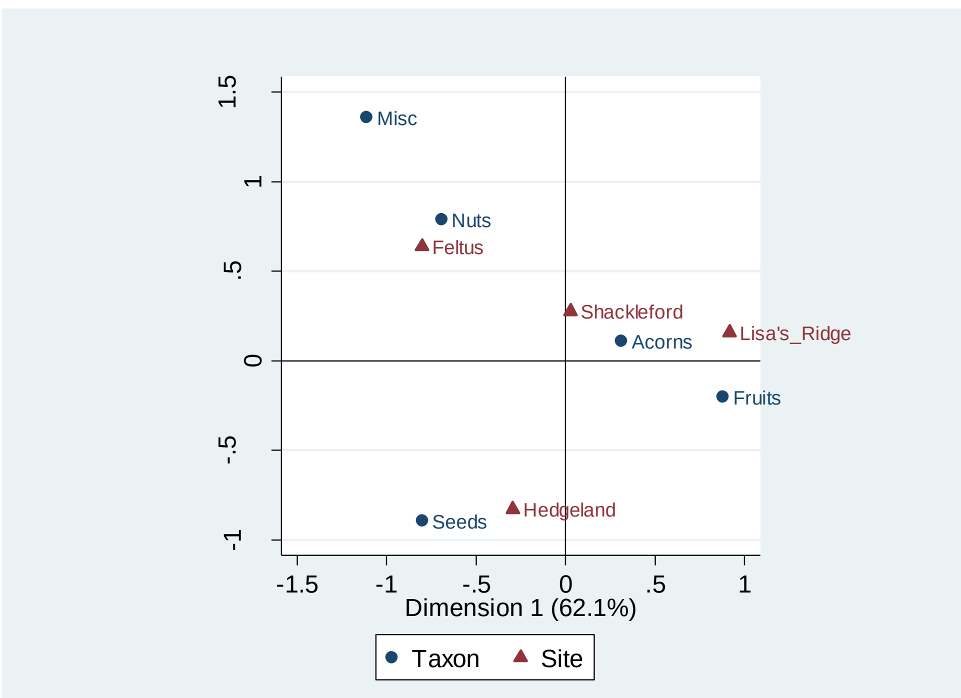

Figure 10. Interregional CA graph (by plant category).

same is true for the fruit category as well. Other nuts, specifically walnut and thin-shell hickory/pecan, occur more frequently at Shackleford Lake than at Hedgeland or Lisa's Ridge, but in similar numbers to Feltus.

Lisa's Ridge

Of the 1,588 identified plant remains at the Lisa's Ridge site, nearly 90% belong either to the acorn (59%) or fruit (30%) categories. Persimmon once again accounts for the large percentage of fruit. Lisa's Ridge stands out not only because of high rates of acorn and fruits, but also because of strikingly low rates of starchy and oily seeds. Together chenopod, cheno-am, cucurbit/bottle gourd, erect knotweed, and sumpweed make up only 2% of the entire assemblage from Lisa's Ridge. Based on standardized counts, Feltus has over 10 times as many starchy and oily seeds. While it is hard to say for certain what accounts for this conspicuous lack of starchy and oily seeds, perhaps the high abundance of starchy acorn resources compensates for this deficit. Overall, Lisa's Ridge lacks the plant diversity seen at other sites, including Feltus. This may be because it is a non-mound site and different activities are being reflected.

Summary

When comparing Feltus to the Hedgeland, Shackleford Lake, and Lisa's Ridge sites, clear differences emerge. These differences are perhaps best highlighted on CA graphs (Figures 9 and 10). The relative lack of acorn but high frequency of thick-shell hickory at Feltus is reflected by the Feltus point appearing higher and farther to the left than the other sites. Had the data from Mound B been included, Feltus would have been more closely correlated with the starchy and oily seed category.

As for starchy and oily seeds, Feltus has nearly the same x-axis coordinates as the starchy/oily seeds category. Hedgeland, which has high concentrations of echinochloa and chenopod seeds, is positioned very closely to the starchy and oily seeds category. Feltus is most closely clustered near erect knotweed and maygrass. The non-mound site, Lisa's Ridge, only had minute amounts of starchy and oily seeds, and appears on the far right edge of the graph.

All three of the Tensas Basin sites had much higher quantities of persimmon, and thereby fruits, than the Feltus site. The Shackleford Lake and Lisa's Ridge sites are most closely correlated with the fruit category on the graph. The Hedgeland site, which contained less fruit by comparison, appears farther away. The relative lack of persimmon at the Feltus site is one of the more notable differences between the sites. While Feltus has less total fruit than the other sites, more grape seeds were found at Feltus than at any other site; this is demonstrated on the CA graph displaying individual taxa.

Far more research would be necessary to uncover the exact causes of the differences between Feltus and the other sites, but resource availability and/or depositional circumstances may be factoring in. For one, the Hedgeland, Lisa's Ridge, and Shackleford Lake sites are all located in the Tensas Basin of Louisiana, west of the Mississippi River, while Feltus lies east of the river in Mississippi. These ecological and geographical differences may have impacted the availability and quantity of certain resources. Pecan trees, for instance, inhabit bottomland areas. This means that they were probably more widely available at the lower elevation Tensas Basin sites than at the bluff-top Feltus site.

Furthermore, the deposits sampled could be fundamentally different—some may have been deposited and covered over relatively quickly, while others may have been used for greater portions of the year. Additionally, deposition could have occurred at different times of year. Regardless of cause, the differences of plant remain assemblages between sites show the variability in Coles Creek settlements in the Lower Mississippi Valley.

DISCUSSION AND CONCLUSIONS

Analysis of flotation samples has shown that the Feltus site conforms to some regional Coles Creek subsistence patterns, while at the same time diverging from others. The plant assemblage from Feltus shows a heavy reliance on acorns and thick-shell hickory, as well as an assortment of starchy and oily seeds. In addition, fruits like grape and cabbage palm were probably also important. The data from Feltus strongly suggests dependence on wild resources, though some small-scale cultivation may have been taking place. Even though maize has been found in small amounts at later period Coles Creek mound sites, it has not yet been found at Feltus, despite the fact that Feltus is presumably a center for public activity. This furthers the idea that domesticates did not play a large role in the diet of people living at Feltus.

When compared to three roughly contemporaneous Coles Creek sites, variations among plant assemblages are found. Data from Hedgeland, Shackleford Lake, and Lisa's Ridge show that people using these sites were more heavily dependent upon resources like acorn, thin-shell hickory/pecan, and persimmon than people at Feltus. Inhabitants of Feltus, on the other hand, perhaps practiced more management of weedy seed-bearing plants. More research is necessary to tease out causes of these differences, but preliminary geographical considerations point to possible ecological factors.

My results serve to emphasize the possibilities for variation within broader regional patterns. Even within contemporaneous sites, plant assemblages may look very different from site to site. While research in the Tensas Basin may provide an important reference point for Coles Creek subsistence patterns as a whole, the findings there cannot necessarily be applied to other sites in the region, such as Feltus.

APPENDICES

Appendix A. Feltus Mounds raw counts table, plaza samples.

Plant Taxa	Plaza L4	Plaza L5	Plaza Zan	Plaza ZA2	Plaza ZBs	Plaza ZCs	Plaza L2.ZC	Plaza L3.ZC	Plaza ZDn	Plaza ZDs	Plaza ZEs
Acorn shell	169	25	10	240	4	17	5	3	33	26	3
Acorn meat	0	0	0	0	0	0	0	2	2	0	0
Thick-shell hickory	164	58	11	10	0	23	43	0	40	83	20
Thin-shell hickory/Pecan	4	3	0	1	0	0	0	0	6	2	0
Walnut	0	1	0	0	0	0	4	0	5	6	0
Amaranth	0	0	0	40	0	1	0	5	3	0	0
Chenopod	3	7	0	3	5	1	0	2	61	0	0
Cheno-am	5	0	0	0	0	0	0	0	7	0	0
Cucurbit rind	0	0	0	0	0	0	0	0	0	0	0
Erect knotweed	0	0	0	0	3	2	1	5	4	2	0
Maygrass	10	22	0	5	11	9	0	8	36	0	1
Smartweed	0	0	0	1	0	0	0	0	0	0	0
Sumpweed	9	0	0	0	0	0	0	0	2	0	0
Blackberry/Raspberry	0	0	0	0	1	2	0	0	0	0	0
Cabbage palm	1	0	0	0	0	0	0	0	0	0	0
Elderberry	0	0	0	0	0	0	0	0	1	0	0
Grape	14	10	2	0	1	0	2	0	4	3	0
Hackberry	0	0	0		0	1	0	0	0	0	0
Maypop	0	0	0	0	1	0	0	0	0	0	0
Persimmon	0	0	0	0	0	0	0	0	1	4	0
Bedstraw	0	0	0		0	0	0	0	0	0	0
Nightshade	0	0	0	0	0	1	0	0	0	0	0
Pokeweed	0	0	0	0	0	8	0	5	0	1	0
Purslane	6	2	0	0	0	5	0	5	98	0	0
Unidentified grass seed	1	0	0	0	0	0	0	0	0	0	0
Unidentified seed	3	5	0	4	0	0	3	0	6	0	0
Unidentifiable	5	0	0	2	2	14	0	11	15	3	0

Appendix B. Feltus Mounds raw counts table, Mound A and Mound B samples.

Plant Taxa	Md A, SE; L3	Md A, SE; L4B	Md A, E; L6	Md A, T; ZC	Md B; ZDw	Md B; ZF	Md B; F3	Md B; L9
Acorn shell	22	12	23	39	0	0	0	1
Acorn meat	0	0	0	0	0	0	0	0
Thick-shell hickory	39	1	2	2	0	1	0	0
Thin-shell hickory/Pecan	6	1	0	0	0	0	0	0
Walnut	4	0	0	0	0	0	0	0
Amaranth	0	0	1	0	0	0	0	0
Chenopod	18	4	3	6	0	0	78	32
Cheno-am	0	0	0	0	0	0	0	0
Cucurbit rind	1	0	0	8	0	0	0	0
Erect knotweed	18	4	4	1	0	0	4	0
Maygrass	11	1	0	6	0	0	0	0
Smartweed	1	0	0	1	0	0	0	0
Sumpweed	2	0	2	0	0	0	1	0
Blackberry/Raspberry	1	0	0	0	0	0	0	0
Cabbage palm	12	0	0	0	0	0	0	0
Elderberry	0	0	0	0	0	0	0	0
Grape	1	1	0	0	0	0	0	0
Hackberry	0	0	0	0	0	0	0	0
Maypop	1	0	0	0	0	0	0	0
Persimmon	3	0	0	0	0	0	0	0
Bedstraw	0	0	3	0	0	0	0	0
Nightshade	1	0	0	0	0	0	0	0
Pokeweed	0	0	0	0	0	0	0	0
Purslane	0	0	0	0	0	0	0	0
Unidentified grass seed	0	0	0	9	2	0	6	0
Unidentified seed	20	3	0	0	0	0	4	1
Unidentifiable	0	0	2	10	0	0	0	0

Appendix C. Feltus Mounds nut weight (g) table, plaza samples.

Plant category	P; L4	P; L5	P; ZAn	P; ZA2	P; ZBs	P; ZCs	P; L2.ZC	P; L3.ZC	P; ZDn	P; ZDs	P; ZEs
Acorn Shell	0.37	0.05	0.04	0.92	0.00	0.06	0.01	0.00	0.08	0.06	0.01
Acorn Meat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
Hickory	0.99	0.39	0.05	0.16	0.00	0.54	0.55	0.00	0.29	0.85	0.26
Thin Shell Hickory/Pecan	0.02	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.04	0.02	0.00
Walnut	0.00	0.04	0.00	0.00	0.00	0.00	0.54	0.00	0.30	0.22	0.00

Appendix D. Feltus Mounds nut weight (g) table, Mound A and Mound B samples.

Plant category	Md A, SE; L3	Md A, SE; L4B	Md A, E; L6	Md A, T; ZC	Md B; ZDw	Md B; ZF	Md B; F3	Md B; L9
Acorn Shell	0.06	0.03	0.06	0.07	0.00	0.00	0.00	0.00
Acorn Meat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hickory	0.34	0.01	0.02	0.03	0.00	0.02	0.00	0.00
Thin Shell Hickory/Pecan	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Walnut	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00

REFERENCES CITED

Brain, Jeffery P.

1978 Late Prehistoric Settlement Patterning in the Yazoo Basin and Natchez Bluffs Regions of the Lower Mississippi Valley. In *Mississippian Settlement Patterns*, edited by Bruce D. Smith, pp. 331-368. Academic Press, New York.

Cowan, C. Wesley

1985 Understanding the Evolution of Plant Husbandry in Eastern North America: Lessons from Botany, Ethnography, and Archaeology. In *Prehistoric Food Production in North America*, edited by Richard I. Ford, pp. 205-243. The University of Michigan Museum of Anthropology, Ann Arbor, Michigan.

Culin, Stuart

1900 The Dickeson Collection of American Antiquities. *Bulletin of the Free Museum of Science and Art of the University of Pennsylvania* 2(3):113-168.

Fritz, Gayle J.

1995 New Dates and Data on Early Agriculture: The Legacy of Complex Hunter-Gatherers. *Annals of the Missouri Botanical Garden*. 82(1):3-15.

___.

1998 The Development of Native Agricultural Economies in the Lower Mississippi Valley. In *The Natchez District in the Old, Old South*, edited by Vincas P. Steponaitis, pp. 23-47. Research Labs of Archaeology, The University of North Carolina, Chapel Hill.

___.

2000 Native Farming Systems and Ecosystems in the Mississippi River Valley. In *Imperfect Balance: Landscape Transformations in the Precolumbian Americas*, edited by David L. Lentz, pp. 225-249. Columbia University Press, New York.

Fritz, Gayle J. and Tristram R. Kidder

1993 Recent Investigations into Prehistoric Agriculture in the Lower Mississippi Valley. *Southeastern Archaeology* 12(1):1-14.

Kassabaum, Megan C.

2006 Field Summary of 2006 Excavations at Feltus Mounds Site. Journal on file, Research Labs of Archaeology, University of North Carolina, Chapel Hill.

Kidder, Tristram R.

1992 Coles Creek Period Social Organization and Evolution in Northeast Louisiana. In *Lords of the Southeast: Social Inequality and the Native Elites of Southeastern*

North America, edited by Alex W. Barber and Timothy R. Pauketat, pp. 145-62. American Anthropological Association, Washington, D.C.

___.
2002 Woodland Period Archaeology of the Lower Mississippi Valley. In *The Woodland Southeast*, edited by David G. Anderson and Robert C. Mainfort, Jr., pp. 66-90. University of Alabama Press, Tuscaloosa.

Lower Mississippi Survey
1971 Excavation report on Feltus and Pumpkin Lake. Electronic copy of manuscript draft, retrieved from http://www.rla.unc.edu/feltus/, accessed April 14, 2008.

Martin, Alexander C. and William D. Barkley
1961 *Seed Identification Manual*. University of California Press, Berkeley, California.

Miller, Naomi F.
1988 Ratios in Paleoethnobotanical Analysis. In *Current Paleoethnobotany*, edited by Christine A. Hastorf and Virginia S. Popper, pp. 72-85. University of Chicago Press, Chicago.

Moorehead, Warren K.
1932 Exploration of the Etowah Site in Georgia. In *Etowah Papers* by Phillips Academy Department of Archaeology. Yale University Press, New Haven, Connecticut.

Pearsall, Deborah M.
2000 *Paleoethnobotany: A Handbook of Procedures, Second Edition*. Academic Press, San Diego.

Popper, Virginia S.
1988 Selecting Quantitative Measurements in Paleoethnobotany. In *Current Paleoethnobotany*, edited by Christine A. Hastorf and Virginia S. Popper, pp. 53-71. The University of Chicago Press, Chicago.

Roberts, Katherine McKisson
2006 Seasonality, Optimal Foraging, and Prehistoric Plant Food Production in the Lower Mississippi in the Tensas Basin, Northeast Louisiana. Ph.D. dissertation, Washington University, Saint Louis. University Microfilms, Ann Arbor.

Scarry, C. Margaret
2003 Patterns of Wild Plant Utilization in the Prehistoric Eastern Woodlands. In *People and Plants in Ancient Eastern North America*, edited by Paul E. Minnis, pp. 50-104. Smithonian Books, Washington, D.C.

Scarry, C. Margaret and Richard A. Yarnell
2006 Domestication of Plants in the East. In *Environment, Origins, and Population,* edited by Douglas H. Uberlaker, pp. 428-436. Handbook of North American Indians, Vol. 3, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Smith, Bruce D. and C. Wesley Cowan
2003 Domesticated Crop Plants and the Evolution of Food Production Economies in Eastern North America. In *People and Plants in Ancient Eastern North America*, edited by Paul E. Minnis, pp. 105-125. Smithonian Books, Washington.

Steponaitis, Vincas P.
1998 Native American Cultures of the Precolonial South. In *The Natchez District in the Old, Old South*, edited by Vincas P. Steponaitis, pp. 1-22. Research Labs of Archaeology, The University of North Carolina, Chapel Hill.

Wagner, Gail E.
1988 Comparability among Recovery Techniques. In *Current Paleoethnobotany*, edited by Christine A. Hastorf and Virginia S. Popper, pp. 17-35. The University of Chicago Press, Chicago.

Watson, Patty Jo
1976 In Pursuit of Prehistoric Subsistence: A Comparative Account of Some Contemporary Flotation Techniques. *Midcontinental Journal of Archaeology* 1:77-100.

Yarnell, Richard A.
1982 Problems and Interpretations of Archaeological Plant Remains of the Eastern Woodlands. *Southeastern Archaeology* 1:1-7.