

Analysis of Plant Remains from the Fort Bragg site

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Introduction

Archaeological plant assemblages represent only a small fraction of what was originally used and deposited by humans in open-air settings. Natural and cultural factors can significantly modify organic remains, resulting in recovered assemblages that differ dramatically from the original deposits. As archaeologists, we examine collections that have undergone a series of processes—from the original selection of plants and animals by humans, to food preparation, cooking, discard, animal and insect scavenging, burial, decay, and weathering, to the recovery of food residues by archaeologists. Using standard methodological procedures for sampling, quantification, and analysis allows us to make sense of our assemblages in spite of the deleterious effects of these processes. Here we report on the identification and analysis of two archaeobotanical samples from Fort Bragg, North Carolina (31CD1854). Only basic results are discussed; due to a limited number of samples, no quantitative analysis was conducted.

Recovery and Preservation Bias

The circumstances under which plants preserve best archaeologically involve extreme conditions (e.g., exceptionally wet, dry, or cold environments) that prohibit decomposition of organic matter (Miksicek 1987). Plants can also preserve through exposure to fire, which can transform plant material from organic matter into carbon (Miksicek 1987). The likelihood that a plant will become carbonized varies according to the type of plant, how it is prepared and used, and whether it has a dense or fragile structure (Scarry 1986). Plants that are eaten whole are less likely to produce discarded portions that may find their way into a fire. Plants that require the removal of inedible portions (e.g., hickory nutshell, corn cobs) are more likely to find their way into a fire, and thus into the archaeological record. Inedible plant parts represent intentional discard that is often burned as fuel. Moreover, because inedible portions tend to be dense and fibrous, they are more likely to survive the process of carbonization than the edible parts (e.g., hickory nutshell vs. nutmeats). Physical characteristics are also important for determining whether or not a plant will survive a fire. Thick, dense nutshells are more likely to survive a fire than smaller, more fragile grass seeds. Food preparation activities also affect potential plant carbonization. The simple process of cooking provides the opportunity for carbonization through cooking accidents. Foods that are conventionally eaten raw, however, are less likely to be deposited in fires than cooked foods. Some plants that find their way into the archaeological record in carbonized form were not eaten at all. Wood fuel is the most obvious example. Burned house structures can also yield carbonized plant deposits, and these deposits often differ dramatically from refuse deposits (Scarry 1986).

While we cannot ever hope to know the absolute quantities or importance of different plants in any past subsistence economy, the preservation and recovery biases discussed above do not prohibit quantitative analyses of archaeobotanical assemblages. The most commonly used plant resources in any subsistence economy are more likely to be subject to activities that result in carbonization (e.g., through fuel use and accidental burning) and ultimately, deposition (Scarry 1986; Yarnell 1982). Thus, we can

quantitatively examine the relative importance of commonly used plant resources through time and across space.

Laboratory Procedures

Two flotation samples from the Fort Bragg site were collected with unknown volumes. Both the light and heavy fractions of the flotation samples were analyzed. Although the materials from the light and heavy fractions were processed and sorted separately, data from the two fractions were combined for presentation. According to standard practice, the light fractions were weighed and then sifted through 2.0 mm, 1.4 mm, and 0.7 mm standard geological sieves. Carbonized plant remains from both fractions were sorted in entirety down to the 2.0 mm sieve size with the aid of a stereoscopic microscope (10–40 X). Residue less than 2.0 mm in size was scanned for seeds, which were removed and counted; in addition, taxa encountered in the 1.4 mm sieve that were not identified from the 2.0 mm sieve were also removed, counted, and weighed. Acorn nutshell was also collected from the 1.4 mm sieve as this tends to fragment into smaller pieces and can be underrepresented in the 2.0 mm sieve. Botanical materials were identified with reference to the paleoethnobotanical comparative collection at the University of California, Santa Barbara (UCSB) paleoethnobotany lab, various seed identification manuals (Martin and Barkley 1961; Delorit 1970), the USDA pictorial website (<http://www.ars-grin.gov/npgs/images/sbml/>), and Minnis (2003) which allowed us to identify the range of taxa native to the region. All plant specimens were identified to the lowest possible taxonomic level. Taxonomic identification was not always possible—some plant specimens lacked diagnostic features altogether or were too highly fragmented. As a result, these specimens were classified as “unidentified” or “unidentified seed.” In other cases, probable identifications were made—for example, if a specimen closely resembled a sunflower seed, but a clear taxonomic distinction was not possible (e.g., the specimen was highly fragmented), then the specimen was identified as probable sunflower and recorded as “*Helianthus* cf.”. Once the plant specimens were sorted and identified, we recorded counts, weights (in grams), portion of plant if relevant (e.g., acorn nutshell versus nutmeat), and provenience information. Wood was weighed but not counted, and no wood identification was conducted. Generally, most of the seeds identified in the samples were too small to weigh, and thus only counts were recorded. Other than counts and weights, no other measurements were taken on any specimens.

Basic Results

Table 1 lists the common and taxonomic names of all identified species. Raw counts and weights are provided for each taxon; plant weight and wood weight are also provided. Combined, these samples yielded 5 plant taxa (identified to the Genus level). Acorn (*Quercus* sp.) was the only nuts recovered from the flotation samples, and consisted entirely of nutshell remains. Acorn processing depends upon whether the nuts derive from white or red oak trees. Nuts from the red oak are high in tannin and are extremely bitter as a result. White oaks, however, yield sweeter nuts; the nutmeats from these acorns can be used for cooking immediately after extraction from the shell (Scarry

2003). The tannin present in the bitter acorns, however, requires an additional processing step. Leaching the tannin from acorns can be accomplished either by soaking them in water, or parching and then boiling them with an alkaline substance such as wood ash. Once processed, acorns were generally ground into a fine meal, which could then be used to make gruel, bake bread, or thicken stews. Less often, acorns were boiled and the oil extracted (Swanton 1944:260, 277).

Fruit taxa recovered from the samples are represented by three species. One wild grape (*Vitis* sp.) seed was identified, several nightshade (*Solanum* sp.) seeds, and one possible *Prunus* sp. seed. The *Prunus* sp. may represent a wild cherry or beach plum. Each of these fruits is edible and would most likely have been eaten raw, incorporated into stews, or dried for later use (Scarry 2003).

One grain/oil seed identified is a possible sunflower (*Helianthus* sp.). It is uncertain whether it is wild or domesticated, but wild sunflower seeds could have been gathered and domesticated seeds cultivated simultaneously. Grain seeds were probably parched and could be ground down to a meal and baked into bread or incorporated into stew. Similarly, oil seeds could be mixed into bread meal and/or stews (Scarry 2003).

Table 1. Summary of plant taxa for Fort Bragg flotation samples

| | | | |
|-------------------------------|-----------------------|-----------|------------|
| N of Samples | 2 | | |
| Plant Weight (grams) | 12.09 | | |
| Wood Weight (grams) | 11.68 | | |
| Common Name | <i>Taxonomic Name</i> | Count (n) | Weight (g) |
| <u>Nuts</u> | | | |
| Acorn | <i>Quercus</i> sp. | 52 | 0.1 |
| <u>Fruits</u> | | | |
| Grape | <i>Vitis</i> sp. | 1 | 0.01 |
| Prunus sp. cf. | <i>Prunus</i> sp. | 1 | 0.02 |
| Nightshade | <i>Solanum</i> sp. | 15 | 0.01 |
| <u>Grain/Oil Seeds</u> | | | |
| Helianthus sp. cf. | <i>Helianthus</i> sp. | 1 | 0.01 |
| <u>Unidentified</u> | | | |
| | | 62 | 0.26 |

An assessment of seasonality for these plants indicates the harvesting and collection of resources from June through November (Table 2). *Prunus* is available throughout summer into early fall; nightshade is available through late fall; *Helianthus* can be harvested mid summer to mid fall; wild grape late summer through mid fall; and acorn is usually harvested throughout fall. The limited number of samples prevents us from drawing detailed conclusions or conducting any quantitative analysis about plant use at Fort Bragg. However, the presence of acorn nutshell, fruit seeds and possible grain/oil seed indicate potential collection and processing of these documented food sources.

Table 2. Seasonality of Fort Bragg plant taxa in ascending order by bloom

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Common Name | | | | | | | | | | | | |
| Prunus cf. | | | | | | X | X | X | X | | | |
| Nightshade | | | | | | X | X | X | X | X | X | |
| Helianthus cf. | | | | | | | X | X | X | X | | |
| Grape | | | | | | | | X | X | X | | |
| Acorn | | | | | | | | | X | X | X | |

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