Analysis of Plant Remains from SBA-3729

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Report Submitted to Ray Corbett, PhD.

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Introduction

Archaeological plant and animal 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 the archaeobotanical assemblage from one test unit ranging from 20-30 cm depth levels at the SBA-3729 Chumash site in the foothills of Carpinteria, California.

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). Other non-food plants that become carbonized are incidental inclusions, such as seeds blown by wind dispersal (Miksicek 1987; Minnis 1981; Scarry 1986). Indeed, most secondary invaders are weedy species with lots of seeds (e.g., cheno/am plants) (Minnis 1981).

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 SBA-3579 were collected and measured to 10 liter volumes each. (do I need to mention remaining soil that I'm giving back to Ray?) 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 analysis. According to standard practice, the light fractions were weighed and then sifted through 2.0 mm, 1.0 mm, and 0.7 mm standard geological sieves. The heavy fraction component of each sample was weighed and then sifted through 2.0 mm and 1.4 mm standard geological sieves. Carbonized plant remains from both fractions were sorted in entirety down to the first two sieve sizes for each respective fraction with the aid of a stereoscopic microscope (10 x 40 X). Residue less than 1.0 mm in size (light fraction) and 1.4 mm in size (heavy fraction) was scanned for seeds, which were removed and counted.

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), the USDA pictorial website (http://www.ars-grin.gov/npgs/images/sbml/), and Timbrook (2007) 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, probably identifications were made–for example, if a specimen closely resembled acorn, but a clear taxonomic distinction was not possible (e.g., the specimen was highly fragmented), then the specimen was identified as a probably acorn and record as "acorn cf.".

Once the plant specimens were sorted and identified, we recorded counts, weights (in grams), and provenience information. Wood was weighed but not counted, and no wood identification was conducted. In all cases the seeds identified in the samples were too small to weigh, and thus only counts were recorded. Other than counts and weights no other measures were taken.

Basic Results

This section presents the results of the identification of the carbonized plant remains from SBA-3579. Table 1 lists the common taxonomic names of all identified species. Raw counts are provided for each taxon; plant weight and wood weight are also provided. Combined, these samples yielded 12 plant taxa. Possible seed from the *Boraginaceae* family could represent fiddleneck (*Amsinckia menziesii)*. The Chumash and other California Indians ate these seeds and also ground them into a dry meal used to make pinole (Timbrook 2007). A possible *Eriogonum* seed was found that could represent wild buckwheat (*Eriogonum elongatum)* or California buckwheat (*Eriogonum fasciculatum)*. The seeds and roots of these plants were used medicinally and drank as a tea (Timbrook 2007). A possible wild onion (*Allium* spp.) seed was identified. Wild onions were used as insect repellent and for snake and insect bite treatment (Timbrook 2007). A saltbush (*Atriplex* spp.) seed was identified in the sample. This stem and leaves of this plant were used as a tea remedy for colds. In historic times the plant was burned and the ashes used to make lye for soap (Timbrook 2007). Other seeds that are likely incidental inclusions in the sample include Asteracea, Poacea (grass) seeds and canarygrass (*Phalaris* sp.*)*.

Table 1. Summary of plant taxa from SBA-3729

N of Samples	2	
Plant Weight (grams)	0.03	
Wood Weight (grams)	5.61	

Common Name	Taxanomic Name	Count (n)
Buckwheat	*Erigonum*	1
Grass	Poacea	8
Fiddleneck, cf.	Boraginacea	1
Saltbush	*Atriplex*	2
Canarygrass, cf.	*Phalaris*	1
Wild onion, cf.	*Allium*	1
Unidentified seed		3

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