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Chia and the Chumash: A Reconsideration of Sage Seeds in Southern California

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DURING several years of research on Chumash ethnobotany, I have sought information from a wide variety of sources. The most fruitful of these have been John P. Harrington's unpublished ethnographic and linguistic field notes,¹ the extant plant specimens in the Harrington collection at the National Anthropological Archives, and historical documents written by early observers of Chumash culture.

When the available data were compiled on Chumash use of sages (the genus *Salvia*), it became apparent that information collected by Harrington did not agree with the picture presented in most published writings on the Chumash. On the one hand, the archaeological literature generally asserts that the Chumash and their ancestors ate seeds of all four of the most abundant local sage species: one annual herb (commonly known as chia [*Salvia columbariae*]), and three perennial shrubs (black, white and purple sages [*Salvia mellifera*, *S. apiana*, and *S. leucophylla*], respectively). Archaeologists have begun to apply the vernacular term "chia" to the seeds of all these species of sage plants. But, according to Harrington's consultants, the Chumash ate the seeds of only one sage species, the annual *Salvia columbariae*, and that was the only one to which they applied the name "chia." In this paper the term "chia" refers only to that species, following the usage of Harrington's consultants and most botanical reference works.

The available information on Chumash use of sage seeds is presented first, followed

by a brief comparative summary of sage seed use among other southern California peoples. It is then suggested that the prevailing views in the archaeological literature have been derived from incorrect interpretations of ethnohistorical data and from errors in historical documents. Finally, I comment on resource availability and food preferences as they relate to the question of sage seed exploitation.

This problem is important because it affects our assumptions that settlement location depends on accessibility to critical resources such as water and food supplies. The identification of these food resources is a key to interpreting the archaeological record and, in turn, to developing an understanding of subsistence and settlement patterns in prehistoric southern California.

CHIA AND THE CHUMASH

Chumash methods of preparing food from chia seeds are described repeatedly throughout Harrington's notes: the seeds were toasted in soapstone ollas or with hot coals in a basket, then pounded before being eaten either mixed with water into a thin gruel or molded into dry cakes. According to Harrington's Chumash consultants, the pounding was done in a mortar, not in a metate or on a shallow milling stone. Both Fernando Librado of Ventura and Maria Solares of Santa Ynez said that chia meal or drink was consumed a little at a time, between bites of other foods, to vary the taste and cleanse the palate (Harrington MS).

Harrington's notes offer little evidence to support the use of seeds from the three local sage species which are large, woody shrubs. The plant from which chia seeds were collected was described by Fernando Librado: "The chia is low and never grows over two feet high." Several consultants discussed methods of harvesting chia seeds (Harrington MS):

They just put a basket under it and hit it with a seedbeater. It is easy to pick.

They beat it into a basket 1 ft. in diameter and 6-8" high. Empty this into a larger basket . . .

They would pile chia and thrash chia with the seedbeater.

The use of a hooked pole to pull the seed heads over the basket was confirmed by some consultants and denied by others. Some described holding the gathering basket between the knees, or "beating the bush" with the seedbeater, which might indicate a relatively large plant.

Nonetheless, most of the evidence favors chia being a low, herbaceous plant. The two local sage species which best fit this description are *Salvia columbariae*, commonly called "chia," and *S. carduacea*, thistle sage (Fig. 1). A third herbaceous species, *S. spathacea*, hummingbird sage, has a sticky involucre which would prevent harvesting of seeds with a seedbeater.

At least two Chumash consultants mentioned that there were two kinds of chia, although no labeled specimens are extant to confirm this. A Ventureño consultant said that "there are two kinds of chia, a coarser and a finer kind. The finer kind is preferred" (Harrington MS). In addition to his own notes, Harrington's collection contains some notebooks written by Ventureño Juan Estevan Pico, who worked with Henshaw in the 1880s. Pico listed the two kinds of chia

as *itepesh*, "chia" or "chia fina" ["fine" or "delicate chia"], and *paj*, "chia gruesa" ["coarse chia"]. Harrington's Kitanemuk consultants also spoke of "chia" and "another kind of chia," the latter being less preferred. This "other kind" has been identified from a specimen as thistle sage (*Salvia carduacea*).

Chia may be considered an item of high cultural significance, according to linguistic clues. Most of Harrington's consultants provided names for chia in one or more Chumashan languages (Table 1), but few knew names for any of the other species. Lucrecia Garcia, the Barbareño consultant who collected the specimens, was the only one who provided names for *Salvia leucophylla* and *S. mellifera*. These appear to be descriptive terms rather than true names, as one component of the binomial [*olkopkop* "herb"] was also applied to several kinds of grasses. If no true names existed for the woody perennial sage species, or if the names could not be recalled by Harrington's consultants, it might indicate these plants were less important to the Chumash.

When California Indian people began to speak Spanish, a second set of vernacular names was introduced. People seem to have applied these new names to the indigenous categories. Harrington's Chumash consultants used the Spanish common name "chia," like the Chumash word *itepesh*, to refer to both the seeds and the plant itself. I have not found any indication in Harrington's field notes or plant specimens that the Chumash people themselves applied the term "chia" to the seeds of more than one kind of sage. While the Chumash did eat the young shoots of woody perennial sages and used the leaves and shoots in medicine and offerings, Harrington's notes do not indicate that the seeds of these plants were ever collected.

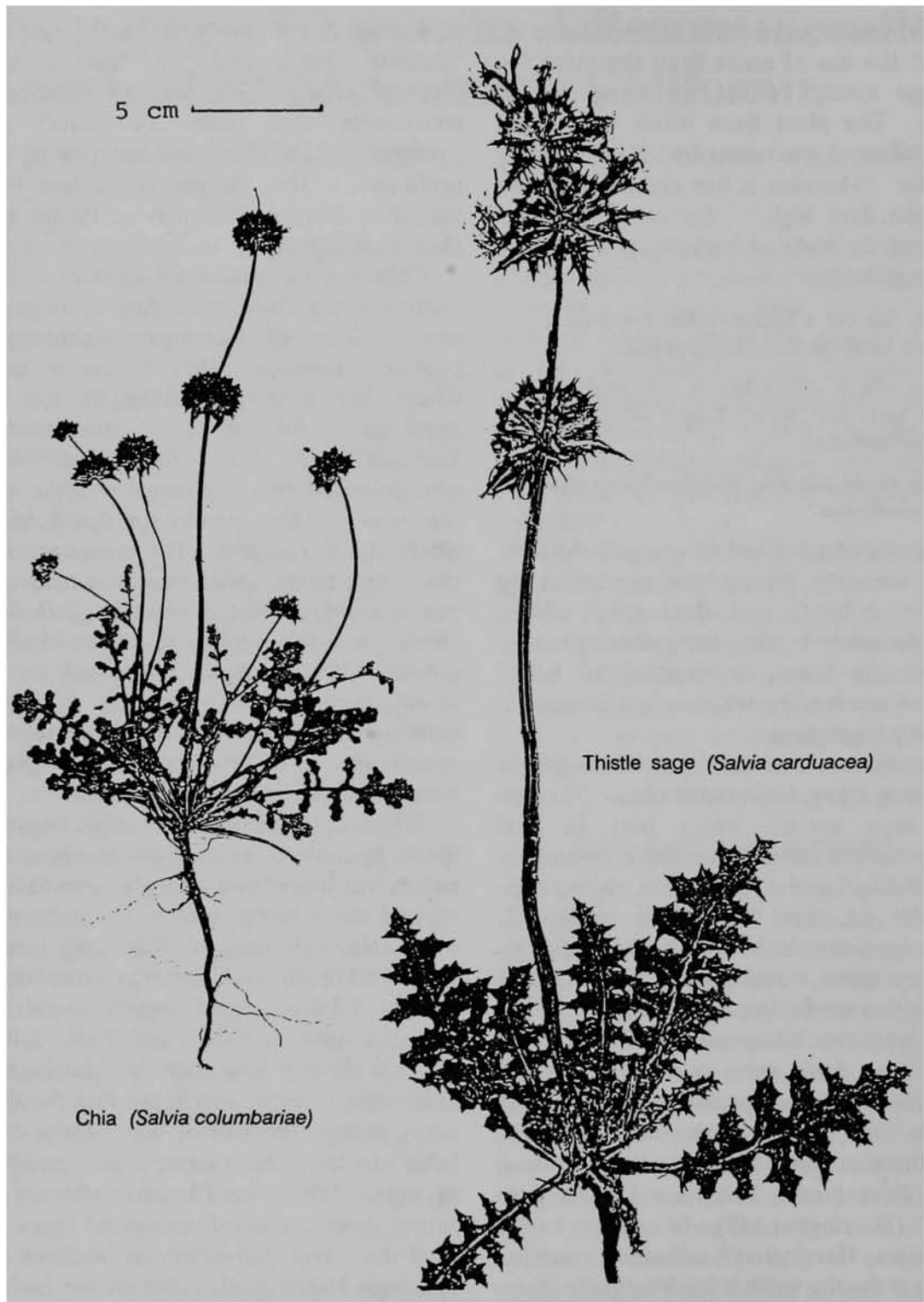


Fig. 1. The "two kinds of chia" described by Chumash and Kitanemuk consultants (3/8 natural size).

Table 1
CHUMASH NAMES FOR *SALVIA* SPECIES

Species	Barbareño	Ventureño	Ineseño	Spanish
<i>S. apiana</i> * (white sage)	<i>xapcix</i>	—	—	salvia real
<i>S. carduacea</i> (thistle sage)	—	<i>pax</i>	—	chia gruesa
<i>S. columbariae</i> (chia)	<i>'ilepesh</i>	<i>'itepesh</i>	<i>'i'lepesh</i>	chia
<i>S. leucophylla</i> * (purple sage)	<i>'olkopkop lunepepez</i> [= 'herb' — 'gray']	—	—	salvia
<i>S. mellifera</i> * (black sage)	<i>'alastaxcuy,</i> <i>'olkopkop ubaulapcan</i> [= 'herb' — 'green']	—	—	salvia verde
<i>S. spathacea</i> * (hummingbird sage)	<i>qimc</i>	—	—	diocita

— no name recorded

* identified from specimen collected and labeled by Harrington's consultant Lucrecia Garcia, National Anthropological Archives, Smithsonian Institution.

Harrington (MS) went through Jepson's 1925 manual and noted that the sage family included the following plants: "chia, white sage, black sage, yerba buena." He equated chia with *Salvia columbariae* and the Barbareño Chumash name *'ilepesh*, but did not give Spanish or Chumash names for the other species. He, too, apparently was certain that the category "chia" did not include the other sage species listed.

SAGE SEEDS IN SOUTHERN CALIFORNIA

Is the Chumash information gleaned from Harrington's notes consistent with patterns among other southern California Indian peoples? A survey of the ethnographic literature turned up fairly good data for six groups (Cahuilla, Luiseño, Diegueño, Tübatulabal, Costanoan, and Kitanemuk), and less adequate for four more (Salinan, Fernandeno, Gabrielino, and Serrano).

Both the seeds and green parts of various sage species were employed in food, medicine and ceremony by Indian peoples throughout much of California. The species used for seeds included two perennial shrubs, white sage (*S. apiana*) and black sage (*S. mellifera*), and two annual herbs, chia (*S. columbariae*) and thistle sage (*S. carduacea*).

All of the southern California groups for whom information is available ate the seeds of at least one to as many as all four of these species. Cahuilla and Luiseño ate all four kinds (Bean and Saubel 1972:136; Sparkman 1908:196). The Tübatulabal and Kitanemuk ate seeds of two species, chia sage and thistle sage (Voegelin 1938; Harrington MS); the Costanoan ate only chia (Levy 1978:491; Bocek 1984:253). None of the groups surveyed seem to have eaten seeds of purple sage (*S. leucophylla*).

Most southern California peoples made distinctions between one kind of sage seeds and another. Preference was usually expressed for chia, *S. columbariae*. For example, species of sages were used for seed flour by the Diegueño, "especially *Salvia columbariae*, chia" (Luomala 1978:600); and among the Luiseño the seeds of chia were "much more esteemed than any other" (Sparkman 1908:196). Kitanemuk consultants Magdalena Olivas and Eugenia Mendez said that the "other kind of chia," thistle sage, was "not very good-tasting but [they] used to gather it when [they] did not have much *pahinatshr* [chia] . . . it is not flavorful" (Harrington MS).

Names in Tatic languages (Table 2) confirm that southern California peoples distin-

Table 2
TAKIC NAMES FOR *SALVIA* SPECIES

Tribe	<i>Salvia apiana</i>	<i>S. carduacea</i>	<i>S. columbariae</i>	<i>S. mellifera</i>
Cahuilla (Bean and Saubel 1972:136-138)	<i>qas'ity</i>	<i>palnat</i>	<i>pasal</i>	<i>qas'ity</i>
Luiseno (Sparkman 1908:229)	<i>kashil</i>	<i>palit</i>	<i>pashal</i>	<i>kanavut</i>
Fernandeño (Kroeber 1908:12)	---	---	<i>pasill</i>	---
Gabrielino (Merriam 1967:436-437)	---	---	<i>pah-see*</i>	---
Gabrielino (Crespí 1769; A. Brown personal communication 1986)	---	---	<i>pasal</i>	---
Serrano (Merriam 1967:436-437)	---	---	<i>pa-he-natch*</i>	---
Kitanemuk (Harrington MS)	---	<i>pahinait**</i>	<i>pahinatshr</i>	---

--- No name recorded.

* Merriam's "wild flax" (see Note 1).

** Identified from specimen in John P. Harrington collection, National Anthropological Archives, Smithsonian Institution.

guished between kinds of sage. The term for *Salvia columbariae* is fairly uniform throughout much of the area.² The same word was recorded among the Hokan-speaking Salinan (Mason 1912:206). Each of the other sages seems to be given its own name, although the two woody species are called by the same name in Cahuilla. The differences within the latter folk taxon were probably recognized but not considered important.

In central and southern California, then, the relatively high cultural significance of *Salvia columbariae* compared to other sages is suggested by the fact that its seeds were universally described as "the most highly esteemed." In fact, it was the only one of the five most widespread sage species reported to have been eaten by every group in whose territory it occurs. The Chumash would not be inconsistent with the southern California pattern if they had eaten only this one species of sage seeds.

CHIA IN THE ARCHAEOLOGICAL LITERATURE

Most authors today assume or imply that

the word "chia" means "sage seeds" and that it encompasses several local species of *Salvia*. One recent textbook on California archaeology states that "acorns and chia (sage) seeds were notable" among Chumash plant foods (Moratto 1984:118). Interior sites in the Chumash area, it goes on, were occupied by both inland and coastal people "who hunted deer, caught salmon, and gathered acorns, sage seeds, and other vegetal products" (Moratto 1984:141).

The broad interpretation of the term "chia" seems to have developed something like this: (1) We know from ethnohistoric sources that "chia seeds" were used by the Chumash. (2) We know that "chia" is a kind of sage. (3) We know that, in Chumash territory today, other kinds of sage are perhaps more common than true chia and that seeds of these more common species were used by Indians elsewhere in California. (4) Therefore [in a great leap of logic], the Chumash and their ancestors must have relied on several species of *Salvia*, and "chia" and "sage seeds" are for all practical purposes synonymous terms. In the following section I will discuss the origins of this

broad view, argue that it is based on false premises, and point out particular instances where data should be interpreted differently.

The merging of "chia" and "sage seeds" can be traced back to efforts by King (1967) to interpret archaeological millingstone assemblages in the Santa Monica Mountains. He suggested that, in the list of identified usable plants present in the vicinity of this site, the various species of the genus *Salvia*, or sages, represented a major resource. According to ethnohistoric accounts, he said, the seeds of sages and grasses were prepared with a millingstone (King 1967:57). He proposed that the four principal species of *Salvia* which are found in dense concentrations throughout the area--annual chia (*S. columbariae*) and especially three larger, shrubby species, black, white, and purple sage (*S. mellifera*, *S. apiana*, and *S. leucophylla*, respectively)--would provide a dependable source of food and large quantities of seeds, which can be gathered over a long harvest season. These four species are shown in Figure 2.

With regard to Chumash use of sages, King interpreted too broadly the ethnohistoric sources upon which he based his assumptions about exploitation and preparation of available species. For example, Harrington's Chumash data published by Craig (1967) are cited, but actually include uses only for "chia," not other kinds of *Salvia*; and the seeds are described as being pounded in a mortar, not a millingstone.

Abundance is another issue that has been raised. Following King, various authors have observed that the plant botanists call "chia," *Salvia columbariae*, is relatively uncommon compared to other species in Chumash territory. As Horne (1981:276-277) said:

The name "chia" is ordinarily taken to mean *S. columbariae* . . . I am, however,

inclined to think that chia refers to the edible seeds of all *Salvia* spp. It is difficult to imagine that the small and relatively scattered *S. columbariae* could have had much dietary importance by itself (see Smith 1976:246). Taken with other species of its genus, it could have provided substantial dietary bulk.

There are two problems with scarcity as justification for broadening the term. First, evidence presented below indicates that *Salvia columbariae* was more common in Chumash times than it is today. In addition, Harrington's consultants told him that chia was consumed "a little at a time," not that it "provided substantial dietary bulk."

Citation of comparative ethnographic data was also used to support the argument for probable massive exploitation of sage seeds by the Chumash. A passage was quoted from Barrows (1900) about the cultivation of members of the genus *Salvia* in the New World (King 1967:57). When taken in context, however, the original passage actually pertains to the use of wild *S. columbariae* by the Cahuilla (Barrows 1900:64), not to the use of other sage species by southern California peoples. As noted above, purple sage was one species which was not exploited for seed, despite its widespread distribution and high productivity.

It appears that King, Craig, and subsequent authors have mistakenly applied the name "chia" and the known utilization of this one species to all kinds of sage in the Chumash region. The case for Chumash consumption of several kinds of sage seeds, and for the synonymy of the terms "chia" and "sage seeds" rests on misinterpretation of ethnographic data and the unwarranted extension of observed availability to assumed exploitation.



Fig. 2. *Salvia* species that yield edible seeds and possibly were used by the Chumash, according to King (1967). Upper left, chia (*Salvia columbariae*); upper right, white sage (*Salvia apiana*); lower left, purple sage (*Salvia leucophylla*); lower right, black sage (*Salvia mellifera*).

HISTORICAL SOURCES

Early historical documents have also been cited to support extensive chia use by the Chumash. Explorers' accounts frequently mention "chia" as a food of the southern California Indians, which was presented or sold to expedition members.

Closer examination of these documents shows that many of the instances of explorers receiving chia from the Indians actually occurred among groups other than the Chumash. The most detailed information is found in Crespí's journals of the summer of 1769 and the spring of 1770. These indicate that the food offered changed from one region to another. Chia was prominent all through the interior valleys from the Juaneño-Gabrielino border to the Thousand Oaks vicinity in eastern Chumash territory; from there to the Santa Barbara Channel roasted yucca heads were common; and along the Channel the gifts were all in fish (A. Brown, personal communication 1986).

Another widely-quoted early visitor was describing areas other than the Chumash, and a third may not have presented original observations. In 1775, the explorer Pedro Fages did not mention chia in his section on the Chumash, although he listed "three kinds of chia" as items of Salinan native diet in the area near Mission San Antonio (Priestley 1937:59). Longinos Martínez generalized about many different peoples between San Diego and Monterey when he mentioned that sage seeds were an important California Indian food in 1792 (Simpson 1961:46). His material on the Chumash was pirated from Crespí, however, and there is some question whether he ever actually visited the area (A. Brown, personal communication 1986).

Translation of these documents is part of the reason they have been misinterpreted. In striving to make the documents more easily

understood by the reader, the translator may prefer to minimize use of foreign language terms, substitute the English "sage" for Spanish "chia," and inadvertently distort the meaning. According to Crespí's original diaries, for example, the explorers were presented with bowls or baskets of "chia de refrescar" or "chia para refrescar," which seems to be a refreshing liquid prepared from chia seeds (A. Brown, personal communication 1986). The published version refers to "baskets of sage and other seeds" (Bolton 1927:149, 152). A San Fernando Mission document lists native "pinoles o semillas" (gruels or seeds) including "chia, en idioma *pasill*" (Muñoz and Nuez 1814). When published, the chia of the original document has been modified to become "foods" including "chia (seeds of sage) called *pasill* in their language" (Kroeber 1908:12) or shortened still more to "sage (in their language called *pasill*)" (Geiger and Meighan 1976:85). If one must rely on published versions of these documents, their limitations must be kept in mind.

The Spanish explorers and missionaries were surely influenced by their experiences in Mexico when they applied the name "chia" to a native food resource in California. "Chia" is a Nahuatl word adopted into Spanish. In Mexico it is most often (though not exclusively) applied to two cultivated species, *Salvia hispanica* and *S. chian*; the term particularly refers to the small, oily seeds of these plants which were received in tribute by the Aztecs and prepared into a drink by mixing with water (Martínez 1979:278; Santamaría 1978:371). Seeds of the wild California species have similar characteristics, although the plants which produce them are rather different from those in Mexico.

The widely-distributed folk term "chia" and the various North American species to which it refers could be the subject of

lengthy discussion, but that is outside the scope of this paper. One further comment is in order. In Crespí's original diaries, copies of which were provided by Alan K. Brown (personal communication 1986), the term "chia" seems to refer primarily to the seeds or the preparation made from them. Crespí did not really describe the appearance of the plant, other than to note that in one place it was seen growing in tangles or thickets (*matorrales*) along with tall bunchgrasses. The plants were abundant on the plains and river valleys, laden with seeds in late July and early August 1769, and flowering purple (*morada*) in April 1770. Presumably Crespí knew which plant produced the seeds he had received from the Indians, but his descriptions could be stretched to fit any of the sage species in question here. They are too vague to permit positive identification.

A century after the initial exploration of Chumash territory, American scientists unknowingly suffered from confusion caused by Spanish vernacular plant names. The botanist of an expedition performing geographical surveys in southern California wrote:

During the summer of 1875 my attention was called, while in southern California, to a mealy preparation in use among the Indians, Mexicans, and prospectors. Upon inquiry, I found it was called "Chia." Further examination proved that it was furnished by the seeds of *Salvia columbariae* Benth. As a matter of archaeological interest, it may be noted that quantities of this seed were found buried in graves several hundred years old. This proves that the use of the seed reaches back into the remote past [Rothrock 1878: 48-49].

The burial caches of seed remains mentioned by Rothrock were described in more detail by the archaeologists of the expedition. For example, a sandstone mortar found at Dos Pueblos

was filled with the fine black seeds of *Salvia Columbariae* [sic]. These seeds have been found in receptacles of various kinds and placed with other articles in the graves. It was unquestionably used by the Indians of former times as well as those of the present, and its presence indicates one of the uses to which the mortars were put. The [preparation methods] of Chia are corroborated by one of Yarrow's diggers living in Santa Barbara, who at once recognized the seed when first discovered in the graves, and then and there mentioned the various ways in which it was used at the present day . . . The identification of this seed is by Dr. J. T. Rothrock, botanist of the expedition . . . [Abbott 1879:79-80].

Samples of the seeds collected during that expedition were recently identified by a local seed laboratory.³ They are not *Salvia columbariae* at all, but red maids (*Calandrinia ciliata*), an annual wildflower of the same family as miner's lettuce (Portulacaceae). The seeds that John P. Harrington's Chumash consultants called *xutash* or "pil" and used for ritual offerings were red maids. These seeds have been found in many Chumash sites, including burial contexts on Santa Rosa Island, the Santa Barbara coastline and the Santa Ynez Valley (Orr 1968: 200; Yarrow 1879:36-39; Harrington 1928: 177-178). Examples of these archaeological finds are shown in Figure 3. It can be seen that chia and red maids seeds are not at all similar in form.

Why did Rothrock make this mistake? Even when well acquainted with the flora of a region, field botanists are not always able to recognize seeds not associated with the plant that produced them. Probably the crew member on the 1875 survey was familiar with the local chia (*Salvia columbariae*) or the seeds called "chia" in Mexico and, unaware that the local Indians had used any

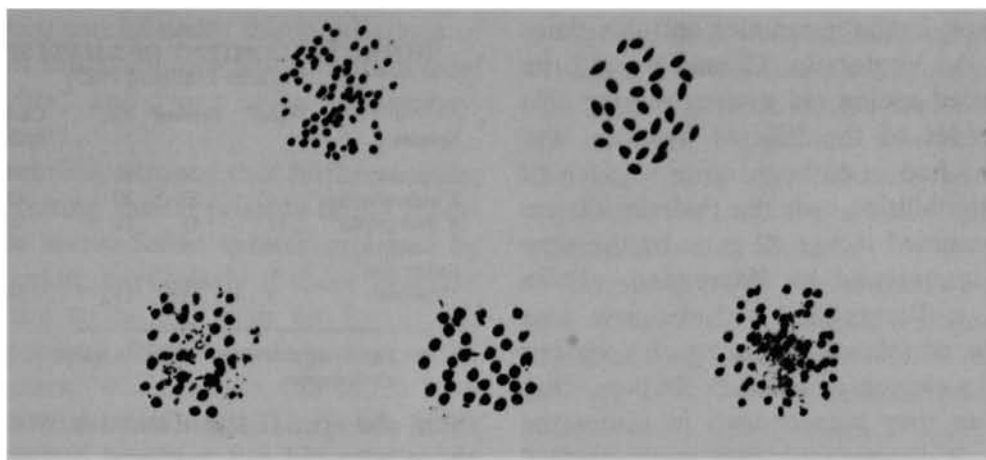


Fig. 3. Comparison of chia with red maids seeds (actual size). Upper row: left, red maids (*Calandrinia breweri*); right, chia (*Salvia columbariae*), blackened by toasting. Both are fresh seed collected by the author, 1986. Lower row: left, "chia" from Dos Pueblos; center, "chia" from La Patera (Goleta); right, "miners' lettuce" from Ranch House site, Santa Rosa Island. These three archaeological samples are actually all red maids (*Calandrinia ciliata*). For information on collector, date of collection, catalogue number, and botanical analysis, see Note 3.

other kinds of seeds, may have leapt to the conclusion that this was it. Rothrock's erroneous identification of red maids seeds as *Salvia columbariae* was probably influenced by his worker's opinion.

These archaeological seed caches, along with explorers' references to "chia," have been used as evidence in favor of the argument that the Chumash made such great use of "chia" that it could not possibly be restricted to one relatively sparse annual species. The present examination has shown that this historical evidence does not in fact support the broad interpretation of the term "chia."

RESOURCE AVAILABILITY AND FOOD PREFERENCES

If chia was so important in Chumash subsistence, the question goes (Smith 1976:246), where were sufficient quantities obtained? The second part of this question is addressed first.

That chia could in fact be obtained in

some quantity is illustrated by a report of a Nomlaki woman who had in her possession "a remnant of 6 or 7 pounds" of *Salvia columbariae* seeds, having gathered them the previous year in the Sacramento Valley; she valued them for making "soup" (Chesnut 1902:384). These seeds were identified, one must assume correctly, by the U.S. Department of Agriculture.

In the past, *Salvia columbariae* often covered many acres in the plains and chaparral of Cahuilla territory and was usually readily available near most villages. The Cahuilla actually managed chia stands by burning them periodically to facilitate the next season's growth (Bean and Saubel 1972: 137). This species is known to be encouraged by fire. Like the Cahuilla, the Chumash burned grasslands for management of wild food crops (Timbrook et al. 1982).

Harrington's notes contain many comments about how common chia once was. Kitanemuk consultants said "there used to be lots of chia here in the Tejon region,

everywhere, in the mountains and the plains also." A Ventureño Chumash said he remembered seeing old women picking chia on the sides of the hills at Ventura, and that there had once been quite a patch of chia on the hillside near the Paderon Blanco but he assumed it was all gone by the time he was interviewed by Harrington. Luisa Ygnacio, a Barbareño, said she saw Jose Venadero *silinahuwit* gathering chia on her ranch at a canyon near Santa Barbara, "but later when they turned cows in where the chia was, it disappeared--they ate it, maybe" (Harrington MS).

Today, *Salvia columbariae* is not seen along the heavily developed coastal plain, although it is still plentiful on disturbed soils in the foothills and in the back country. Harrington's consultants noted a significant reduction in chia distribution and abundance, which is due to three principal factors: introduction of grazing animals, especially cattle, turned loose in grasslands and chaparral; introduction of non-native weeds, especially annual grasses, which compete with indigenous species; and cessation of Chumash burning practices which had promoted growth of chia and other economic plants until about 200 years ago. Thus, even in relatively undeveloped areas, the plant communities we see today may have been rather different in Chumash times.

Now, to return to the first part of the question, were chia seeds "so important" in Chumash subsistence? It is likely that the actual volume of chia used may not have been quite so large as had been assumed before the massive archaeological seed caches, formerly thought to be chia, were reassessed. Chia seeds were, however, very much relished and unquestionably significant in a qualitative sense.

Some other California peoples used the seeds of several sage species, but not all of

Table 3
NUTRITIVE CONTENT OF *SALVIA* SPECIES*
(after Gilliland 1985)

Species	Water	Protein	Fat	Carbo- hydrate	kcal/ 100 g.
<i>S. apiana</i>	8	10	12	65	410
<i>S. columbariae</i>	8	22	20	45	448
<i>S. leucophylla</i>	11	15	11	59	395
<i>S. mellifera</i>	9	8	9	70	394
<i>Salvia</i> spp. mean	9	14	13	59	412

* Figures are percentages rounded to nearest whole number.

them did so. If the Chumash were among those who did not, perhaps it was because they preferred chia for some reason over the seeds of other sage species and had enough other plant and animal food resources that they did not have to rely on less preferred seeds.

The basis of this preference may have been taste, which is correlated with certain nutritional aspects (Table 3). Seeds of *Salvia columbariae* have been found to be at least half again as high in protein and twice as high in fat as seed from the three woody perennial sages found in Chumash territory (Gilliland 1985:46). High protein and fat content means these seeds would be more filling or satisfying to the consumer, and perhaps have a richer or "better" flavor. This could very well account for the preferences expressed by the Chumash, Kitanemuk, Luiseño, and others. Those California peoples who regularly ate other, less tasty *Salvia* species may have done so because they could not afford to be choosy.

CONCLUSIONS

To conclude the evidence and arguments presented in this paper, I make two important suggestions for the future. First, it has been shown that native peoples very clearly distinguished chia sage from other species of *Salvia*. Therefore, translators and southern California archaeologists are urged

to be more careful about the implications of their own folk taxonomy and to refrain from using "chia" and "sage seeds" as synonymous terms.

Second, it is obvious that further archaeological testing should precede broad generalizations about *Salvia* species exploited by the Chumash, particularly if these generalizations are to be the basis for hypotheses about economy, human ecology, and settlement pattern. For example, the switch from metate and mano to mortar and pestle in the Middle Period is often taken as an indication of a shift away from small, hard seeds and toward the development of acorns as a principal food resource. However, Deetz (1970: 118) suggested that grinding-implement size and shape were more likely to have been determined by demands for community mobility than by the plant material being processed. Even though metates were superseded by stone mortars after the Early Period, we know that in historic times the small seeds of red maids, grasses, chia, and several kinds of sunflowers were still being exploited and ground with the mortar and pestle. Michael Glassow (personal communication 1986) suggested that, even in early times, millstones need not have been intended exclusively for sage seed processing.

Very little archaeobotanical work has been done in the Chumash region. In the most thorough study yet conducted (Hammett and Wohlgemuth 1982), charred seeds were recovered from a hearth feature at a site in Malibu Canyon, on the southeastern border of Chumash territory. The investigators were able to attribute some of the seeds to the genus *Salvia*. Unfortunately, identification to species was not possible, either from the comparative collection developed for the project or by consulting commercial seed testing laboratories. Further seed studies are urgently needed. With new flotation

techniques and the possibility of good preservation of carbonized plant remains in some sites, there is some chance that we may yet be able to determine whether, several thousand years ago, the early ancestors of the Chumash used the seeds of just one or of several species of *Salvia*.

Glassow (1979) commented on the problem of scant or absent archaeological confirmation of key assumptions about subsistence ecology based on ethnohistoric and environmental data. His concern is appropriate to the present question about *Salvia*. Harrington's data should not be taken as the final authority on *Salvia* use. But until archaeological evidence can be marshalled to show that species other than *S. columbariae* actually were used, we should not assume that any species available, edible, and used by other groups was necessarily used by the Chumash or their ancestors.

The arguments in this paper address the Chumash in the historic and late prehistoric periods. As of now, there is no real evidence that the Chumash ate seeds of any species of *Salvia* other than *S. columbariae* (chia) and perhaps *S. carduacea* (thistle sage). This is not a mystery. Preferential selection of foods with better flavor--which in turn is related to nutritional factors--has been included in some general models of hunter-gatherer subsistence, but has been largely ignored in the literature on southern California prehistory. It may be particularly relevant among groups like the Chumash, where the economic base was secure enough to permit the luxury of choice.

NOTES

1. To extract all ethnobotanical material from Harrington's notes, the entire collection of original Chumash documents--some 300,000 pages--was examined in detail at the National Anthropological Archives. This process began in 1978 and was completed before the notes were pub-

lished on microfilm (Harrington 1986). The editors have agreed that providing reel and frame citations for Harrington references in this article would significantly delay its publication, and have accepted citations as "Harrington MS." This exception to the revised 1985 style guide for the *Journal* should not be taken as a precedent by other authors.

2. The Gabrielino and Serrano words recorded by Merriam (1967:436-437) were for a plant he called "wild flax." Clearly he was referring to chia, although he did not use that term. Many authors have noted similarities in the mucilage-producing properties of flaxseed and chia (e.g., Bard 1894:4).

3. The identifications of the archaeological seed samples were made on 18 March, 1986, by A. Meyr, N. Vivrette, and H. Barnett of Ransom Seed Laboratory, P.O. Box 300, Carpinteria, California. Results were as follows:

Analysis report #F 1732 (Smithsonian cat. no. 18600, collected by Paul Schumacher at Dos Pueblos, 1875): *Calandrinia ciliata*.

Analysis report #F 1734 (Smithsonian cat. no. 62658, collected by H. C. Yarrow at La Patera, 1875): *Calandrinia ciliata*.

Analysis report #F 1733 (SBMNH cat. no. 131.60B/3291 [I. 1851A], collected by David Banks Rogers on Santa Rosa Island, 1927): *Calandrinia ciliata*.

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