

CHUMASH ETHNOBOTANY: A PRELIMINARY REPORT

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ABSTRACT.—The Chumash, a hunting, gathering, fishing and seafaring people of coastal southern California, were greatly affected by Spanish missionization beginning in the 1770s. Mexican settlement and later Americanization exerted their own influences, and by the early 20th century the Chumash had been pushed nearly to the brink of extinction. Although the people survived physically, most of their culture perished. Recently, much has been learned about the early Chumash way of life through ethnographic and linguistic data which were collected while Chumash culture still lived in memory, combined with historic, archaeological, and museum resources. This paper summarizes what has thus far been reconstructed of Chumash knowledge and uses of plants in late prehistoric times and after European contact. Chumash ethnobotany has broader implications for theoretical issues in the nature of hunting-gathering societies, interpretation of the archaeological record, human ecology, acculturation, and folk taxonomic studies.

INTRODUCTION

At the time of the first Spanish voyages of discovery along the southern California coast, beginning with Cabrillo in 1542, the Santa Barbara Channel Islands, mainland coast, and adjacent interior mountains and valleys were occupied by about 15,000 people who later became known as the Chumash. Although never politically unified much beyond groups of villages, and that only in certain areas, they were culturally and linguistically similar enough to be considered by anthropologists as a single, albeit somewhat variable, cultural entity.

The climate of Chumash territory is of Mediterranean type, with warm dry summers and cool moist winters. Coastal temperatures ($^{\circ}\text{F}$) average in the 40s in January, upper 60s in July. Diurnal and seasonal fluctuations in temperature are greater in the inland areas than along the coast. The rainy season, with average rainfall of about 43 cm at Santa Barbara, lasts from November to April. Virtually no precipitation occurs the rest of the year. Early summer fogs give way to late summer heat and drought, with occasional wildfires fanned by winds from interior deserts (Smith 1976:3-6).

The bulk of the Chumash population resided along the plain on the coastal side of the Santa Ynez Mountains. This range runs parallel to the east-west coastline, and rises to a height of some 1200 meters within just a few kilometers of the shore. Vegetation on the coastal plain was dominated by grassland-oak savannah. Coastal sage scrub and chaparral were also widespread plant communities; the latter is a dense growth of several species of stiff woody shrubs covering the slopes of the mountains and higher foothills. Numerous stream channels of both seasonal and permanent watercourses, lined with riparian vegetation, dissected the coastal plain. Stream channels often terminated in coastal marshlands. Inland, oak savannah and woodland dominated the valleys, with stands of coniferous trees in the higher mountains. Within a relatively short distance from any settlement there were a variety of different plant communities, each with its own set of valuable resources which contributed to the subsistence, material culture and religious behavior of the Chumash people.

The Chumash were hunter-gatherers, with particular emphasis on ocean fishing by coastal groups. The marine and terrestrial environments were both rich in species diversity and extraordinarily productive, permitting a sedentary settlement pattern and a degree of population density greater than that of most agricultural peoples in aboriginal North America (Brown 1967). Ethnohistoric research has revealed much about the complexity of Chumash society (e.g. Blackburn 1975, 1976; Harrington n.d.; King 1971), which was stratified into classes based on wealth; membership in these was inherited but some opportunities for mobility also existed. Positions of political and religious leadership were inherited. Craft specialization seems to have been controlled by guild-like organizations. Shell bead money functioned as a medium of exchange in a far-reaching network of trade. The Chumash, in short, were a prime example of what have been called "affluent foragers" (Koyama and Thomas 1981) and were not at all typical of the more familiar modern, nomadic hunter-gatherers who have been pushed into marginal environments.

Technologically sophisticated though they were, the Chumash proved no match for the powerful ecclesiastical and military force of the Spanish Empire, nor for the array of contagious diseases which devastated their population and their morale. Although the Mission system, which lasted from 1770 to 1834, was apparently less completely destructive to Chumash culture than was once thought, it so drastically reduced their numbers and altered their outlook that it was impossible to revive the functioning cultural entity after secularization. The Mexican rancho era (1834-1850) and subsequent period of American settlement further contributed to the numerical and cultural decline of the Chumash. Although there are over a thousand people of Chumash ancestry currently residing in Santa Barbara, Ventura and San Luis Obispo counties—the approximate extent of their former territory—Chumash culture may be regarded as virtually extinct.

SOURCES AND METHODS

Because of the lack of knowledge about nearly all traditional plant uses and related lore among today's Chumash descendants, the usual methods of ethnographic and linguistic field work are not useful for gathering information about former practices. Reconstruction of pre-contact and early historic Chumash ethnobotany is therefore a task requiring the pragmatic research method often labeled "ethnohistory." This term may cause some confusion since it is qualitatively different from "ethnobotany," "ethnomusicology," and the like. It has been characterized as the history of non-literate peoples and fundamentally involves incorporation of a diverse variety of sources (Carmack 1972). For this specific research project there are three major sources: historical writings by early travelers and missionaries; unpublished notes from ethnographic and linguistic field work which was conducted early in this century; and archaeological findings, including collections now housed in museums. In addition, a general familiarity with cultural patterns and plant usages throughout the entire central and southern Californian culture area is incorporated, in order to provide a basis for comparison and a context for interpretation of the findings from the other major sources.

The brief logs of the 1542 Cabrillo voyage, which marked the initial contact between Chumash and Europeans, provide very little detail; and subsequent contacts over the next two centuries were few and sporadic (Bolton 1925; Wagner 1929). The major historic sources which provide information about Chumash plant uses begin with the diaries of the Portolá and De Anza expeditions of 1769-1770, particularly the accounts by Crespi (Bolton 1927; Brown n.d., 1965) and Fages (Priestley 1937). These accounts paid much attention to natural resources, with an eye toward establishing Spanish colonies, and therefore contain information about the relationship between native peoples and flora. Further such information is offered by later naturalist-explorer José Longinos Martinez

in 1792 (Simpson 1961) and by Archibald Menzies on the Vancouver expedition a year later (Menzies 1924). By that time Franciscan missions had already been established, certain species of new plants introduced, and traditional Chumash plant-use practices subjected to Spanish-Mexican influence. Writings by the missionaries provide ethnobotanical data, particularly on food and medicine; they are noticeably sparse on material culture and religion, things the padres sought to change rather than understand (Geiger and Meighan 1976). After mission secularization in 1834 there are few historical documents of much use for ethnobotanical reconstruction. Exceptions are two manuscripts on Chumash medicine, one compiled in the late 19th century by a physician (Bard 1894), the other slightly later by a pharmacist (Birabent n.d.).

The bulk of the data available on Chumash ethnobotany comes from field work conducted by the Bureau of American Ethnology anthropologist and linguist, John P. Harrington. He worked sporadically with at least three generations of Chumash consultants from about 1912 into the 1950s, although he collected most of the information in the 1910s and 20s.¹ Plant usages and names in five Chumashan languages as well as Spanish and English are scattered throughout Harrington's tens of thousands of pages of field notes. In addition, several hundred plant specimens were collected by some of his consultants and tagged with Barbareño Chumash and Spanish common names.² Because Harrington usually attempted to note names for the same plant in several Chumashan languages and Spanish, these tagged specimens have enabled accurate botanical identification of numerous plants for which Chumash or Spanish common names prevail, both in his own notes and in many other sources. The Harrington material provides a good core of data on Chumash knowledge and uses of plants into which data from other historical, ethnographic, and archaeological sources can be fitted. In this way, a reasonably detailed picture can be obtained, although it will never be as complete as one which incorporates first-hand fieldwork directed toward ethnobotanical inquiry.

The archaeological record is likewise incomplete, because of poor preservation of plant remains and, until recently, poor techniques for their recovery. This research project has to date directed little attention toward investigation of archaeological plant remains; a large body of site reports awaits perusal. It seems likely that interpretation of archaeological findings will gain in significance when ethnobotanical data from other sources have been compiled and species taxonomically determined. Museum collections do contain both archaeological and ethnographic artifacts and raw materials which are proving useful in supplementing and clarifying data from other sources; examples include wooden bowls, canoe planks, basketry, and caches of medicinal plants.

The ideal method for reconstructing late prehistoric and early historic period Chumash ethnobotany would be to start with the earliest information available and describe changes that occurred in chronological order. This may in fact turn out to be the best way of presenting the information. Unfortunately, the data from early historic times are extremely scanty. The most complete source is the "memory ethnography" conducted after 1910, which reaches only slightly further back than the mission era with any certainty. Accordingly, the constraints of the source materials available force adoption of the so-called "direct historic approach" pioneered by Strong (1940) in Plains ethnohistory, among other authors (e.g. Steward 1942); it consists of working backward in time from the known to the unknown.

One possible drawback of the direct historic approach in Chumash ethnobotanical research is a propensity to what might be called "reconstruction by subtraction." It is tempting merely to eliminate species which are known to have been introduced from the Mediterranean Region in order to arrive at what was presumably the aboriginal tradition. But this results in two serious problems: first, it overlooks the more subtle influences which may have been exerted on plant usages beyond simple introduction of species; and second, it implicitly assumes that aboriginal tradition was static, extending unaltered

into the indefinite distant past. To the contrary, contacts between groups as well as out-right population movements existed prehistorically, not just after European arrival; particular consideration must be given to the date of any piece of information in order to attempt to fit it into this dynamic process of culture change. It is likely, though, that there would have been a relatively stable core of plant usages and related practices that were maintained fairly consistently over the period of a few centuries intended to be covered in this study. It should be possible to determine these by comparing source materials which date from different time periods.

SUMMARY OF THE FINDINGS

Plants which I have thus far determined to have been used by the Chumash are listed in the Appendix at the end of this article.³ Their uses are assigned to standardized, general categories and subcategories to facilitate summarizing a large body of information. More complete descriptions of specific usages, plant parts used, methods of preparation, season of gathering, and other such important topics will be included in a comprehensive monograph which will be published in the future. Vernacular names in the five major Chumashan languages and in the local Spanish dialect are likewise too cumbersome to include in the present format.

Plants for which uses are listed number 156 species, of which 16 are non-native. Of the many plants which were introduced to California from elsewhere and adopted by the Chumash, only those which have become naturalized are included here. Because it is not always clear exactly which of the species in a particular genus were used or not used, the figures are only approximations, but the data presented in the Appendix are roughly summarized in Table 1. Since many plants have more than one use—several have six or seven, oaks and willows have ten or 11—the subcategory figures total higher than the number shown for each major heading.

One difficulty with this scheme for summarizing a very large body of data is that it is hard to see which species were really the most important, in terms of quantities which

TABLE 1. Summary of Chumash plant usages.

Category	Native spp.	Introd. spp.	Total
Food	55	10	65
Medicine	88	9	97
curing	86	9	95
hygiene	10	0	10
Material Culture	60	3	63
clothing	16	1	17
construction	19	2	21
crafts	46	2	48
tools	27	2	29
Ceremonial	36	1	37
religious	25	0	25
magical	17	0	17
amusements	18	1	19
Miscellaneous	22	3	25

may have been used or key roles which they may have played despite small volume obtained. To help balance the tendency toward numerical interpretation of data, which, if carried to excess, may be seriously misleading, I insert here a brief commentary on what I subjectively consider to have been the 20 most important plants in Chumash culture. They are listed taxonomically rather than in order of importance.

1. Pines, particularly piñon (*Pinus monophylla*) but also *P. ponderosa* and *P. jeffreyi*, provided nuts which were a major storable food, pitch as an adhesive and caulking material, and wood for construction and bowmaking.

2. Giant wild rye (*Elymus condensatus*) and carrizo grass (*Phragmites australis*) were most valued for arrowmaking, but also had several other uses. Honeydew deposited on carrizo was a particular delicacy.

3. Bulrush (*Scirpus* spp.) stems were the principal material for mats and house thatching; the rhizomes were also eaten.

4. *Juncus* rush (four species) was virtually the only plant used in basketmaking. Chumash baskets served in numerous vital roles in daily life, as well as being a highly developed art form.

5. Soaproot (*Chlorogalum pomeridianum*) bulbs were used as fish poison, and possibly as human food; the outer husk fibers were made into utilitarian brushes.

6. Brodiaea (*Dichelostemma pulchellum*) bulbs were formerly much more common than they are today and were apparently a major food.

7. *Yucca whipplei* was important as a fiber, food, and fuel plant. Early Spanish explorers were offered roasted yucca "cabbages" and found them quite delicious.

8. Willows, probably several species, constituted the most important material for fuel and for all kinds of construction; e.g., willow poles were lashed with willow bark to form the house framework. They also had a number of medicinal uses.

9. Oaks, particularly *Quercus agrifolia* and *Q. lobata*, yielded acorns which were unquestionably the most important staple food of the Chumash. Their value was due both to abundance and to storability. Oaks had many other uses as well—some 11 are listed in the Appendix—including importance as firewood and coals for toasting seeds.

10. Red maids (*Calandrinia*) seeds were very important as offerings on religious occasions. Large quantities of these small, black seeds have been found as burial accompaniments throughout Chumash territory.

11. *Toyon* (*Heteromeles arbutifolia*) provided hard wood used for arrow foreshafts and many other kinds of tools.

12. Wild cherry (*Prunus ilicifolia*) pits were another abundant, storable staple food.

13. Ceanothus and probably also mountain mahogany (*Cercocarpus betuloides*) wood was made into digging sticks, essential tools for harvesting many edible plants.

14. Prickly pear cactus (*Opuntia* spp.) had among the most diverse uses of any plant: fruit and stems as food, thorns for ear piercing, juice for medicine and dye.

15. *Chuchupate* (*Lomatium californicum*) root was a highly valued magical plant especially for affording protection from rattlesnakes.

16. Indian hemp (*Apocynum cannabinum*) and to a lesser extent milkweed (*Asclepias* spp.) fiber was most important for making string and cordage. These were essential for canoemaking, fishing lines, nets, clothing, and other necessities of life.

17. Chia sage (*Salvia columbariae*) seeds were a major food, constantly mentioned by Harrington's Chumash consultants and many other historical sources. These seeds also had medicinal uses. Other species of *Salvia* seem to have been much less used.

18. Jimsonweed or *toloache* (*Datura meteloides*) was the single most important ceremonial/religious plant. It induced visions enabling contact with the supernatural, and was also extensively used in curing.

19. Native tobacco (*Nicotiana* spp.) was used for ceremonial purposes, as well as being smoked or eaten for enjoyment and health.

20. *Artemisia californica* and *A. douglasiana* both had several uses, the former principally for ritual and ceremony, the latter as medicine.

It will be noted that there are few medicinal plants named in the above list. This is not because I doubt the efficacy of native health care practices, but because it is difficult to assess their importance when little information is available about how frequently Chumash people resorted to herbal medicine.

DISCUSSION

Following the brief overview just presented of the range of plant usages by the Chumash, in this section I will address three related topics which have emerged in the course of this research. First, how did contact with Europeans and the species they introduced affect Chumash plant use practices? Second, how did the Chumash think about plants and categorize them? What if any correlation exists between Chumash folk taxonomy and the Linnaean system? Third, what other kinds of plant-human interactions can be suggested? That is, in connection with being gatherers of plants, how did the Chumash as hunter-gatherers affect the ecological system in which they lived?

As might be expected, the highest proportion of introduced plants is seen in the food and medicine categories. The large total number of medicinal plants (97 spp.) may be related to the many uses that were introduced to the Chumash in the mission era for plants which were native over a wide area from Mexico to southern California. Studies in recent decades (e.g. Gardner 1965, Weyrauch 1982) indicate that the Chumash, like most peoples, have probably always been willing to try new remedies, especially for colds and for the dermatitis induced by poison oak. It seems very likely that even though medicinal plants may have a wide distribution, their uses may have been discovered by peoples in some parts of the range but not in others. Hispanic folk medicine undoubtedly had a significant influence on Chumash practices from very early historic times.

New dietary items introduced with the agricultural mission economy had a profound effect on the inventory of Chumash food plants which is scarcely reflected in the numbers presented here, owing to the elimination of cultivars from the list. Leaving those plants aside and focusing only on naturalized species, which behave like native plants in "just growing wild," it is clear that the Chumash readily adopted those which were most like plants they were already using. These included small seeds of annual grasses, dock and mustard; fresh greens of mustard, watercress and mallow; and the larger, less spiny fruit and pads of *Opuntia ficus-indica*, a species which hybridized with the native prickly pears.

The same can be said of plants used in material culture: new species were adopted to fill the same functions as the native plants to which they were most similar. There were only three species which were introduced into material culture, with seven uses among them. Giant reed (*Arundo donax*) supplemented the large native wild rye and carrizo grasses in construction, arrowmaking and other crafts. The large introduced prickly pear cactus joined its native counterparts in being used for paint, sealant and other things as well as for food and medicine. Finally, mallow was found to be suitable for stringmaking, although it was considered inferior to Indian hemp, milkweed and nettle.

In ceremonial categories, however, the evidence indicates that no introduced species were adopted into either religious or magical functions. This is to be expected owing to the greater conservatism and importance of tradition in those aspects of life, in contrast to pragmatic willingness to experiment with foods and remedies. The only introduced plant in the amusement category was, again, giant reed, which was used like carrizo grass for cigarette-like tubes to hold smoking tobacco.

The number of native species in the list should be expanded somewhat after further study of the source materials and comparison with known plant use patterns of neighbor-

ing groups in the wider culture area. It now seems as though several species which the Chumash would be expected to have used are not mentioned, particularly numerous species of native bunch grasses and seed-bearing composites. These gaps can probably be attributed principally to the small sample of consultants interviewed by Harrington, the late date of his study after many traditional usages had been forgotten, and the fact that his salvage ethnography was quite wide-ranging rather than focused on ethnobotany.

The degree of correlation between Chumash folk botanical taxa and Western scientific genera and species must be addressed in any study such as this. Chumashan languages are no longer spoken and there are no knowledgeable consultants who can aid in folk taxonomic inquiries. It has therefore been a matter of real concern that a researcher trained to think in terms of Linnaean taxonomy could completely misinterpret or at least seriously misunderstand the categories of organisms represented by Harrington's recorded Chumash names.

Careful analysis of plant descriptions included in Harrington's field notes and of the labeled, pressed specimens collected by his consultants has relieved much of my anxiety on that score. As Berlin and his colleagues (Berlin 1973; Berlin et al. 1973, 1974) have found with other peoples, the Chumash seem to have fairly consistently placed plants into categories that bear a remarkable similarity to our own, and to have based them on morphological features in most cases. To give three examples: they distinguished⁴ between spiny gooseberries (*stímíy*, *Ribes amarum*; *stímíy'íwá*, *R. speciosum*) and non-spiny currants (*sqa'yi'nu*, characterized as "smooth," attributed to *R. malvaceum*), reflecting a division made by some authors, *Ribes* and *Grossularia* spp.; between white-flowered (*seq*, *Ceanothus megacarpus*) and blue-flowered (*washiko*, *C. oliganthus*, *C. spinosus*) groups of *Ceanothus*; and between the evergreen coast liveoak (*ku'w*, *Quercus agrifolia*) and deciduous valley oak (*ta'*, which includes both *Q. lobata* and the deciduous, lobed-leaved *Q. dumosa* var. *kinselae*).

Other factors are sometimes seen in Chumash plant categorization. Usage is reflected in the fact that separate names were given to taxa used for coiled basketry foundations (Ventureño *tasb*), for sewing strands (*mexme'y*), and for twined basketry (*'esmu*); however, even in this case the divisions also seem to coincide with Western species (attributed to *Juncus balticus*, *J. textilis*, and *J. acutus*, respectively, from descriptions by Harrington's consultants). Habitat may sometimes be invoked in distinguishing between similar plants. For example, *Equisetum telmateia* var. *braunii* and *Ephedra viridis*, superficially similar in having jointed stems, were both called *woshko'loy* in Barbareño Chumash, but the latter was distinguished with a suffix indicating the interior mountain range where it was found: *woshko'loy* "*bi cimajimol*" [sic] = "*tsiwaya* (?) [*tsiwaya*, San Emigdio Mountain (Applegate 1975:44)].

Cultural ecology deals with the interrelationships between people and plants. The above discussion has already addressed some of the effects of plants on the Chumash people in terms of their usage and classification. The effects that people have on plants can be either deliberate or unintentional. Gathering plants for human use is a deliberate act which may have unintentional effects, such as depletion of fuelwood; to date no evidence has been found that the Chumash "overexploited" any plant species. Long-term habitation in particular sites has resulted in formation of the distinctive midden soil, which tends to be colonized by certain species of plants. Although most of Chumash habitat has been extensively altered by recent suburban development, the Channel Islands are relatively undisturbed. On Santa Cruz Island, native tobacco is only found on middens of former village sites, and *Datura* is found in far greater concentrations there than in any other location. Both these plants were of great importance in Chumash religion and ceremony. I suspect that they were introduced to the islands by the Chumash, although fertility or chemistry of the soil may also have some bearing on their preference for colonizing middens. The intended or accidental effects humans had on the distribution of such plants is a question that ethnobotanical research should not overlook.

It has recently been found that the Chumash may have performed significant environmental alterations through the practice of regular burning of grasslands to encourage growth of certain plants which provided human food (Timbrook et al. 1982). By doing this, they affected not only the abundance and vigor of the particular species they sought, but probably had significant effects on the distribution of whole communities or types of vegetation as well. Archaeologists should attempt to recover plant remains and any other data which can yield information about the antiquity of this practice, and also about whether the Chumash may have acted as a selective influence on the morphology as well as on the distribution of the plants they used. Agricultural peoples have modified the plants they use, even those which are not really domesticated (see, e.g., Bye 1981; Nabhan et al. 1981). It is possible that some hunter-gatherers may have had similar effects on their botanical environment.

CONCLUSION

The Chumash are of interest for cultural ecological studies, for at least two reasons: their high population density was supported exclusively by an economic base of hunting, fishing, and gathering wild plants; and they actively manipulated their environment to increase their base of support. Greater knowledge of Chumash ethnobotany, along the lines suggested here, can contribute to a better general understanding of the interdependent relationships between human populations and their natural environment.

In folk taxonomic research, it is useful to have new information to suggest that one more group of people tended to classify plants according to the same morphological criteria which have formed the basis for Western "scientific" taxonomy, fitting into the general pattern noted by Berlin, Raven and others (Berlin 1973; Berlin et al. 1973, 1974; Raven et al. 1971). For the Chumash, this remains only a suggestion since the original data are incomplete, and prehispanic language and folk categories are unknown among today's descendants.

Study of any people's plant knowledge and uses are also of great potential importance for understanding the processes of culture contact and change, and how they affect the mechanics of everyday life. The Chumash case offers excellent opportunities for such research, and offers a model for the use of archival sources in ethnobotanical investigation.

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NOTES

¹Though Harrington managed to publish only one major work on the Chumash (a culture trait list, Harrington 1942), his unpublished field notes have proved to be a gold mine of information on all aspects of Chumash language and culture which is being tapped by a new generation of researchers (for a partial list, see Anderson 1978). The field notes, related documents and plant specimens from Harrington's work with Indian peoples all over North America are housed at the National Anthropological Archives, Smithsonian Institution, Washington, D.C. Microfilm copies of much of this material are being made available.

²Although the specimens were generally in poor condition, I was able to identify most of them by sight or with the aid of standard reference floras (Munz 1959; Jepson 1925; Smith 1976). These attributions were confirmed, and additional identifications made, by botanists visiting from the Santa Barbara Botanic Garden who are much more expert than I in dealing with dried material. The collections of the U.S. National Herbarium were also used for species comparison in some instances. Since all but a few of Harrington's Chumash plant specimens were collected in the 1920s by a single Barbareño consultant, they only represent her knowledge and those species which were available in a small part of coastal Chumash territory. In earlier times it was common for people to travel inland to collect many other very important species not available near the coast.

³These determinations were made using various combinations of the following: actual labeled plant specimens; descriptions in Harrington's notes or other sources; common names in Chumashan languages, English or local Spanish dialects; study of artifacts made from plants. The attributions are generally very conservative, and many more species were probably used than are shown here.

⁴Unless otherwise noted in the text, the terms given are from the Barbareño Chumash language, and the identifications are from specimens. The orthography follows the practical system designed by Applegate (1975a), with the substitution of x for underlined h to minimize typesetting difficulties.

APPENDIX

Plants Used by the Chumash

A few introductory comments are necessary to explain what is included in this appendix, what is omitted, and what sources were consulted.

The list includes only those identified species for which Chumash usages were mentioned in one or more of the 50 references which are enumerated below. Most of the information was obtained through firsthand study of John P. Harrington's notes and plant specimens; that which came from research by other authors based on the Harrington material was carefully evaluated—and some identifications changed—before being included. Many other ethnographic, botanical and historical sources were also consulted and similarly evaluated.

Certainly many more species were likely to have been used than the information available at this late date would indicate, and some of the plants in the list may have had additional uses which were not mentioned in the sources I have examined. Naturalized species are included, but cultivars are not. The list omits the many plants which were only named, described, or collected and preserved as specimens, if no use was recorded for them. And plants which have not been botanically identified are also omitted, even though uses were mentioned. The plants are listed by family, genus and species, following the arrangement given in Smith's (1976) flora of the Chumash area.

SOURCES CITED IN THE APPENDIX

- | | |
|--|---|
| 1. Author's analysis of material objects | 26. Harrington 1944 |
| 2. Applegate n.d. | 27. Heizer 1955 |
| 3. Applegate 1975a | 28. Heizer 1970 |
| 4. Applegate 1975b | 29. Henshaw 1885 |
| 5. Bard 1894 | 30. Hudson 1977 |
| 6. Bell 1931 | 31. Hudson & Blackburn n.d., 1982, 1983 |
| 7. Bingham 1890 | 32. Hudson et al. 1977 |
| 8. Birabent n.d. | 33. Hudson, Timbrook & Rempe 1978 |
| 9. Blackburn 1963 | 34. Jepson 1925 |
| 10. Blackburn 1975 | 35. Jepson 1936 |
| 11. Bolton 1925 | 36. Jepson 1943 |
| 12. Bolton 1927 | 37. Kroeber 1908 |
| 13. Caballería y Collell 1892 | 38. Menzies 1924 |
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| 15. Craig 1966 | 40. Priestley 1937 |
| 16. Craig 1967 | 41. Rothrock 1876, 1878 |
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| 18. Gardner 1965 | 43. Smith 1976 |
| 19. Geiger and Meighan 1976 | 44. Timbrook 1982 |
| 20. Grant 1964 | 45. Timbrook, Johnson & Earle 1982 |
| 21. Greenwood 1972 | 46. Wagner 1929 |
| 22. Harrington n.d. | 47. Walker & Hudson in press |
| 23. Harrington 1928 | 48. Webb 1952 |
| 24. Harrington 1934 | 49. Weyrauch 1982 |
| 25. Harrington 1942 | 50. Yarrow 1879 |

APPENDIX 1. Plants Used by The Chumash.

Plant species	Spec. at NAA	FOOD	MEDICINE cur. hyg.	MATERIAL clo. con.	CULTURE cra. tools	GEREMONIAL rel. mag. amu.	MISC. USES	REFERENCES
<i>Macrocystis pyrifera</i>	1	—	—	—	—	—	X anchor	2, 22, 31
POLYPODIACEAE								
<i>Dryopteris arguta</i>	3	—	X	—	—	—	—	5, 8, 18, 21, 22, 47, 49
<i>Pteridium aquilinum</i>	3	—	—	—	X	X	—	17, 22
EQUISETACEAE								
<i>Equisetum</i> spp.	1	—	X	—	—	X	—	22
PINACEAE								
<i>Pinus monophylla</i>	0	X	—	—	—	X	X fuel	2, 3, 8, 22,
<i>P. jeffreyi</i>	0	X	X	—	—	X	X	28, 31, 32, 33, 49
<i>P. ponderosa</i>	0	X	X	—	—	X	X	
TAXODIACEAE								
<i>Sequoia sempervirens</i> ^a	0	—	—	—	X	—	—	3, 22, 32, 33
CUPRESSACEAE								
<i>Juniperus californica</i>	0	X	X	—	—	—	X	3, 5, 13, 19, 22, 26

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE cur. hyg.	MATERIAL CULTURE clo. con. cra. tools	CEREMONIAL rel. mag. amu.	MISC. USES	REFERENCES						
EPHEDRACEAE													
<i>Ephedra viridis</i>	1	—	X	—	—	X	—	—	—	—	—	5, 8, 14, 18, 20, 21, 22, 43, 49	
TYPHACEAE													
<i>Typha</i> sp.	2	X	—	—	—	X	X	—	—	—	—	3, 22	
<i>T. domingensis</i>	1	X	—	—	—	X	X	—	—	—	—		
ZOSTERACEAE													
<i>Phyllospadix torreyi</i>	0	—	X	—	X	X	X	—	—	—	—	1, 8, 22, 31, 47	
POACEAE													
<i>Arundo donax</i> (I)	0	—	—	—	—	X	X	X	—	—	X	—	22, 43, 48
<i>Avena fatua</i> (I)	1	X	—	—	—	—	—	—	—	—	—	fodder	2, 22
<i>Bromus</i> spp. (I)	2	X	—	—	—	—	—	—	—	—	—	—	2, 22
<i>Distichlis spicata</i>	0	X	—	—	—	—	—	—	—	—	—	—	2, 22
<i>Elymus condensatus</i>	3	—	—	—	X	X	—	X	—	—	X	—	1, 9, 22, 24, 25, 31
<i>Muhlenbergia rigens</i>	0	—	—	—	—	—	X	—	—	—	—	—	1, 17, 20, 25
<i>Phragmites australis</i>	0	X	X	—	—	—	X	X	X	—	X	—	22, 25, 31, 32, 43

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE		MATERIAL CULTURE				CEREMONIAL			MISC USES	REFERENCES
			cur.	hyg.	clo.	con.	cra.	tools	rel.	mag.	amu.		
AMARYLLIDACEAE													
<i>Allium</i> spp.	0	X	—	—	—	—	—	—	—	—	—	—	13, 22
<i>Dichelostemma pulchellum</i>	5	X	—	—	—	—	—	—	—	—	—	—	10, 13, 22, 27, 32
AGAVACEAE													
<i>Yucca whipplei</i>	1	X	—	—	X	—	X	X	—	—	—	fuel, tattoos	2, 9, 12, 20, 22, 25, 26, 31, 40
SAURURACEAE													
<i>Anemopsis californica</i>	0	—	X	—	—	—	—	—	—	—	—	—	5, 8, 18, 22, 47, 49
SALICACEAE													
<i>Populus fremontii</i>	1	—	X	—	X	X	X	—	—	—	—	fuel	3, 10, 22, 32, 33
<i>P. trichocarpa</i>	1	—	X	—	X	X	X	—	—	—	—	fuel	
<i>Salix laevigata</i>	1	—	X	X	X	X	X	X	X	—	X	fuel,	2, 3, 8, 9, 15, 22, 25, 31, 32, 33
<i>S. lasiolepis</i>	3	—	X	X	X	X	X	X	X	—	X	tan- ning fuel, tan- ning	

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE		MATERIAL		CULTURE	CEREMONIAL			MISC.	REFERENCES	
			cur.	hyg.	clo.	con.	cra.	tools	rel.	mag.	amu.	USES	
JUGLANDACEAE													
<i>Juglans californica</i>	0	X	—	—	—	—	X	—	—	—	X	—	3, 9, 16, 21, 22
BETULACEAE													
<i>Alnus rhombifolia</i>	2	—	—	—	—	—	X	—	—	—	—	dyeing	22, 31, 40
FAGACEAE													
<i>Quercus agrifolia</i>	3	X	X	X	X	—	X	X	X	—	X	fuel, dye, bait	2, 5, 9, 13, 14, 16, 18, 19, 22, 27, 31, 32, 38, 46, 47 49
<i>Q. dumosa dumosa</i>	1	X	—	—	—	—	X	X	—	—	—	—	
<i>Q. dumosa kinselae</i>	1	X	—	—	—	—	X	—	—	—	—	—	
<i>Q. lobata</i>	3	X	—	—	—	—	X	—	—	—	—	—	
URTICACEAE													
<i>Urtica holosericea</i>	0	—	X	—	X	X	X	—	—	—	—	—	2, 19, 22, 31
VISCACEAE (LORANTHACEAE)													
<i>Phoradendron</i> spp.	0	—	X	—	—	—	—	—	—	—	—	—	3, 22

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE cur. hyg.	MATERIAL clo.	CULTURE con.	CRA.	TOOLS	CEMEMONIAL rel. mag. amu.	MISC. USES	REFERENCES
POLYGONACEAE										
<i>Eriogonum elongatum</i>	2	—	X	—	—	—	—	—	—	5, 8, 9, 18, 22, 49
<i>E. fasciculatum</i>	2	—	X	—	—	—	—	—	—	49
<i>Rumex crispus</i> (I)	3	—	X	—	—	—	—	—	—	2, 8, 22
<i>R. hymenosepalus</i>	0	X	X	—	—	—	—	—	—	22
CHENOPODIACEAE										
<i>Atriplex lentiformis</i> subsp. <i>breweri</i>	1	—	X	—	—	—	—	—	(mis- sion: soap- mak- ing)	3, 8, 22, 43, 48
<i>Chenopodium ambrosioides</i> (I)	1	X	—	—	—	—	—	—	—	22
<i>C. berlandieri</i>	1	X	—	—	—	—	—	—	—	22
<i>C. californicum</i>	2	—	X	X	—	—	—	—	—	22
AIZOACEAE										
<i>Carpobrotus aequilaterus</i>	0	X	—	—	—	—	—	—	—	22

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE		MATERIAL CULTURE				CEREMONIAL			MISC. USES	REFERENCES
			cur.	hyg.	clo.	con.	cra.	tools	rel.	mag.	amu.		
PORTULACACEAE													
<i>Calandrinia ciliata</i>	0	X	—	—	—	—	—	—	X	X	—	—	1, 10, 22, 23, 40, 41, 45
<i>Montia perfoliata</i>	1	X	—	—	—	—	—	—	—	—	—	—	22
PAEONIACEAE													
<i>Paeonia californica</i>	2	—	X	—	—	—	—	—	—	—	—	—	5, 8, 22
RANUNCULACEAE													
<i>Clematis lasiantha</i>	5	—	X	—	—	—	—	—	—	—	—	—	3, 8, 22
<i>C. ligusticifolia</i>	1	—	X	—	—	—	—	—	—	—	—	—	
LAURACEAE													
<i>Umbellularia californica</i>	5	—	X	—	—	—	X	—	—	X	—	—	8, 14, 22, 30, 49
PAPAVERACEAE													
<i>Eschscholzia californica</i>	2	—	X	—	—	—	—	—	—	—	—	—	10, 22
BRASSICACEAE													
<i>Brassica</i> spp. (I)	0	X	—	—	—	—	—	—	—	—	—	—	22, 35

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE cur. hyg.	MATERIAL clo. con.	CULTURE cra. tools	CEREMONIAL rel. mag. amu.	MISC. USES	REFERENCES
<i>Lepidium nitidum</i>	1	X	X —	—	—	—	—	8, 22
<i>Rorippa nasturtium- aquaticum</i> (I?)	0	X	X —	—	—	—	—	8, 18, 22, 49
SAXIFRAGACEAE								
<i>Ribes amarum</i>	2	X	— —	—	—	—	—	9, 22, 43
<i>R. speciosum</i>	2	X	— —	—	—	—	—	
PLATANACEAE								
<i>Platanus racemosa</i>	4	—	— —	—	X	—	—	3, 22, 43
ROSACEAE								
<i>Adenostoma fasciculatum</i>	5	—	X —	—	—	X	—	22, 31
<i>A. sparsifolium</i>	0	—	X —	—	—	—	—	5, 8, 18, 19, 22, 49
<i>Cercocarpus betuloides</i>	0	—	— —	—	—	X	—	16, 22, 27, 31, 33, 35
<i>Heteromeles arbutifolia</i>	4	X	— —	X	—	X	X	2, 9, 13, 22, 26, 31, 32

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE		MATERIAL CULTURE				CEREMONIAL			MISC. USES	REFERENCES
			cur.	hyg.	clo.	con.	cra.	tools	rel.	mag.	amu.		
<i>Horkelia cuneata</i>	2	—	X	—	—	—	—	—	—	—	—	—	5, 8, 18, 22, 49
<i>Potentilla glandulosa</i>	6	—	X	—	—	—	—	—	—	—	—	—	
<i>Prunus ilicifolia</i>	6	X	—	—	—	—	—	—	X	—	—	—	3, 5, 10, 11, 13, 18, 19, 21, 22, 32, 33, 40, 42, 49
<i>Rosa californica</i>	3	X	X	—	X	—	—	—	—	—	—	—	8, 18, 22, 26, 49
<i>Rubus ursinus</i>	3	X	—	—	—	—	—	—	—	—	—	—	5, 13, 22
FABACEAE													
<i>Lupinus</i> sp.	1	X	—	—	—	—	—	—	—	—	—	—	16, 22
<i>L. truncatus</i>	1	X	—	—	—	—	—	—	—	—	—	—	22
<i>Trifolium</i> spp.	2	X	—	—	—	—	—	—	—	—	—	—	2, 22
GERANIACEAE													
<i>Erodium moschatum</i> (1)	1	X	X	—	—	—	—	—	—	—	—	fodder	5, 9, 18, 22, 34, 35, 49

[illegible]

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE cur. hyg.	MATERIAL clo. con.	CULTURE cra. tools	CEREMONIAL rel. mag. amu.	MISC. USES	REFERENCES
VITACEAE								
<i>Vitis girdiana</i>	0	X	— — —	—	—	—	—	2, 22, 32
MALVACEAE								
<i>Malacothamnus fasciculatus</i>	2	—	X — —	—	X	—	—	22
<i>Malva parviflora</i> (I)	1	X	X — —	—	X	—	—	5, 8, 14, 18, 22, 49
CACTACEAE								
<i>Opuntia ficus-indica</i> (I)	0	X	X — X X	—	X	—	—	bait, paint 5, 9, 13, 14, 22, 25, 31,
<i>O. littoralis</i>	0	X	X — — —	—	X	—	—	ear- pierc- ing 32, 39, 40, 43, 48, 49
<i>O. oricola</i>	0	X	— — — X	—	—	—	—	—
<i>O. phaeantha</i>	0	X	X — — —	—	X	—	—	tattoo- ing
ONAGRACEAE								
<i>Zauschneria californica</i>	2	—	X — — —	—	—	—	—	8, 35

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE cur. hyg.	MATERIAL CULTURE clo. con. cra. tools	CEREMONIAL rel. mag. amu.	MISC. USES	REFERENCES
ARALIACEAE							
<i>Aralia californica</i>	0	—	X	—	—	—	8, 18
APIACEAE							
<i>Apium graveolens</i> (I)	0	X	—	—	—	—	22, 49
<i>Foeniculum vulgare</i> (I)	1	—	X	—	—	—	19, 49
<i>Daucus pusillus</i>	0	—	X	—	—	X	5, 22, 35, 43, 47
<i>Lomatium californicum</i>	0	X	X	—	—	X	5, 8, 18, 19, 22, 32, 35, 37, 42, 47
CORNACEAE							
<i>Cornus stolonifera</i>	0	—	—	—	X	X	22, 32, 33, 43
ERICACEAE							
<i>Arctostaphylos glauca</i>	5	X	X	—	—	—	2, 5, 16, 22, 49
PRIMULACEAE							
<i>Anagallis arvensis</i> (I)	7	—	X	—	—	—	14, 18, 49

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE cur. hyg.	MATERIAL clo.	CULTURE con. cra. tools	CEREMONIAL rel. mag. amu.	MISC. USES	REFERENCES
OLEACEAE								
<i>Fraxinus dipetala</i>	0	—	X —	—	— X —	— — —	paint	19, 22
GENTIANACEAE								
<i>Centaurium venustum</i>	0	—	X —	—	— — —	— — —	—	8, 22
APOCYNACEAE								
<i>Apocynum cannabinum</i>	0	—	— —	X	X X X	X — X	—	2, 9, 22, 27, 31, 33
ASCLEPIADACEAE								
<i>Asclepias eriocarpa</i>	0	—	— —	—	— — X	— — —	gum	1, 2, 22, 31,
<i>A. fascicularis</i>	0	—	— —	—	— — X	— — —	gum	43
HYDROPHYLLACEAE								
<i>Eriodictyon crassifolium</i>	3	—	X —	—	— — —	— X —	—	3, 5, 8, 9, 18, 22, 31, 47
VERBENACEAE								
<i>Verbena lasiostachys</i>	5	—	X X	—	— — —	— — —	—	22
LAMIACEAE								
<i>Marrubium vulgare</i> (I)	2	—	X —	—	— — —	— — —	—	18, 22, 49

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE cur. hyg.	MATERIAL clo.	CULTURE con. cra. tools	CEREMONIAL rel. mag. amu.	MISC. USES	REFERENCES
<i>Salvia apiana</i>	2	—	X	—	—	X	X	1, 2, 5, 7,
<i>S. columbariae</i>	0	X	X	—	—	X	—	8, 9, 16,
<i>S. leucophylla</i>	4	X	X	—	—	X	X	18, 22, 27,
<i>S. mellifera</i>	4	X	X	—	—	X	X	29, 31, 32,
<i>S. spathacea</i>	4	X	X	—	—	—	—	34, 36, 37,
<i>Satureja douglasii</i>	0	X	X	—	—	—	—	40, 41, 42,
<i>Trichostema lanatum</i>	4	—	X	—	—	—	—	49, 50
SOLANACEAE								
<i>Datura meteloides</i> ^b	1	—	X	—	—	X	—	4, 18, 19, 22,
<i>Nicotiana attenuata</i>	0	—	X	—	—	X	X	27, 36, 47, 49
<i>N. bigelovii</i>	0	—	X	—	—	X	X	2, 9, 10,
<i>N. Clevelandii</i>	0	—	X	—	—	X	X	13, 18, 19,
<i>Solanum douglasii</i>	3	X	X	X	—	—	—	22, 27, 31,
							tattoo- ing	36, 40, 43, 47,
								22, 31

December 1984

JOURNAL OF ETHNOBIOLOGY

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE cur. hyg.	MATERIAL clo. con.	CULTURE cra. tools	CEREMONIAL rel. mag. amu.	MISC. USES	REFERENCES
<i>Artemisia californica</i>	2	—	X	—	X	X	X	8, 18, 22, 31
<i>A. douglasiana</i>	3	—	X	—	—	—	—	1, 5, 8, 9, 10, 14, 18, 22, 47, 49
<i>A. tridentata</i>	2	—	—	—	—	—	—	22
<i>Baccharis glutinosa</i>	1	—	—	—	—	—	—	9, 22
<i>B. pilularis</i>	3	—	X	—	—	—	—	18
<i>B. plummerae</i>	3	—	X	—	—	—	—	5, 8, 18, 19, 22, 49
<i>Gnaphalium bicolor</i>	1	—	X	—	—	—	—	
<i>G. californicum</i>	4	—	X	—	—	—	—	5, 8, 20, 22
<i>G. microcephalum</i>	1	—	X	—	—	—	—	
<i>Grindelia</i> sp.	0	—	X	—	—	—	—	5, 8, 41, 43
<i>Helenium puberulum</i>	1	—	X	—	—	—	—	8, 22, 43
<i>Hemizonia ramosissima</i>	3	X	—	—	X	—	—	6, 16, 22, 43
<i>Heterotheca grandifolia</i>	1	—	—	X	—	—	—	22
<i>Layia platyglossa</i>	0	X	—	—	—	—	—	22

APPENDIX 1. Plants Used by the Chumash (continued)

Plant species	Spec. at NAA	FOOD	MEDICINE		MATERIAL CULTURE				CEREMONIAL			MISC. USES	REFERENCES
			cur.	hyg.	clo.	con.	cra.	tools	rel.	mag.	amu.		
<i>Matricaria matricarioides</i>	1	—	X	—	—	—	—	—	—	—	—	—	5, 8, 18, 21, 22, 49
<i>Perezia microcephala</i>	2	— ^b	X	—	—	—	—	—	—	—	—	—	5, 8, 18, 22, 43
<i>Solidago californica</i>	3	—	X	—	—	—	—	—	—	—	—	—	5, 8, 18, 22, 43
<i>Sonchus oleraceus</i> (I)	3	X	—	—	—	—	—	—	—	—	—	—	22
<i>Xanthium strumarium</i>	1	—	X	—	—	—	—	—	—	—	—	—	8, 18, 22

ABBREVIATIONS USED:

Spec. at NAA = Plant specimens in the Harrison collection at the National Anthropological Archives, Smithsonian Institution

cur. = curing	clo. - clothing	rel. = religious	(I) = Introduced species	numbered references are listed at the beginning of the Appendix
hyg. = hygiene	con. = construction	mag. = magical	X = recorded usage	
	cra. = crafts	amu. = amusements	— = no recorded usage	

^a*Sequoia sempervirens* driftwood was utilized; this plant does not grow in Chumash territory.

^b*Datura meteloides*, despite its acceptance in standard reference works, is an invalid taxon which is undergoing revision (Robert A. Bye, personal communication 1984).