

Chapter 6

The Role of Plants in the Nasca Culture

Luigi Piacenza

Abstract This paper presents the results of the study carried out on plant remains uncovered from various Nasca sites, especially during the archaeological research at the ceremonial center of Cahuachi. The analysis resulted in the identification of a total of 75 botanical species. On the basis of this information, and for the first time, we have evidence to compare similar data coming from several sites. From this study, the presence of several plant species is certain in all the sites, while others are rarely present or absent at all. Overall, this study indicates, that during the time of Cahuachi's apogee, agriculture was very prosperous in the region and was the basis for the development of Nasca civilization.

Keywords Nasca • Plants • Agriculture • Vegetable foods • Botany • Healing and magical plants

6.1 Introduction

In Cahuachi, the renowned ceremonial and religious center of the Nasca culture, plants played an important role in three ways: human alimentation, iconography, and ritual offerings. During the archeological research—which have been maintained for more than 20 years—several botanical samples have been recovered, which has enabled comparison with the remains of plants used as food that were found in a number of archeological sites of this culture (Piacenza 2003). Plants depicted in textiles (Fig. 6.1) and ceramics, on the other hand, have affected the relevance of the more important symbolic vegetables within the religious context.

L. Piacenza (✉)

Centro Italiano Studi e Ricerche Archeologiche Precolombiane, Brescia, Italy
e-mail: chiabra@psaeurope.com; gloria.piacenza@tiscali.it

© Springer International Publishing AG 2016
R. Lasaponara et al. (eds.), *The Ancient Nasca World*,
DOI 10.1007/978-3-319-47052-8_6

101



Fig. 6.1 Cahuachi, Nasca textile. Birds eating vegetables (Photo by Giuseppe Orefici)

6.2 Agriculture

The Nasca agriculture was well developed and founded on the selection and cultivation of several plants of alimentary and utilitarian use (Fig. 6.2). Among edible plants also have to be considered those non-cultivated herbs grouped under the word “yuyo”, which refers to different species, generally of the genera *Chenopodium* and *Amaranthus*. Remains of these herbs were found among the ancient vegetables used at Cahuachi. We do not know whether the Nascas consumed them, but we believe that they did so because said plants were part of their environment.

The archeological research has enabled confirmation of the presence of 16 genera of cultivated nutritive plants: peanut (*Arachis hypogaea*), jack-beans (*Canavalia plagioperma*), jíquima (*Pachyrhizus tuberosus*), beans (*Phaseolus vulgaris*), lima beans (*Phaseolus lunatus*), mandioca (*Manihot esculenta*), squash (*Cucurbita máxima*), butternut squash (*Cucurbita moschata*), sweet potato (*Ipomoea batatas*), ají (*Capsicum frutescens*), maize (*Zea mays*), achira (*Canna edulis*), cassava (*Inga feuillei*), lúcuma (*Pouteria lucuma*), apple guava (*Psidium guayaba*), and plum (*Bunchosia armeniaca*). These products were surely part of the gastronomic resources of the Nasca people.

Moreover, there are highly important plants of utilitarian use such as cotton (*Gossypium barbadense*), which enjoyed a great socio-economic interest, and the calabash or bottle gourd (*Lagenaria siceraria*), which was used as a container for

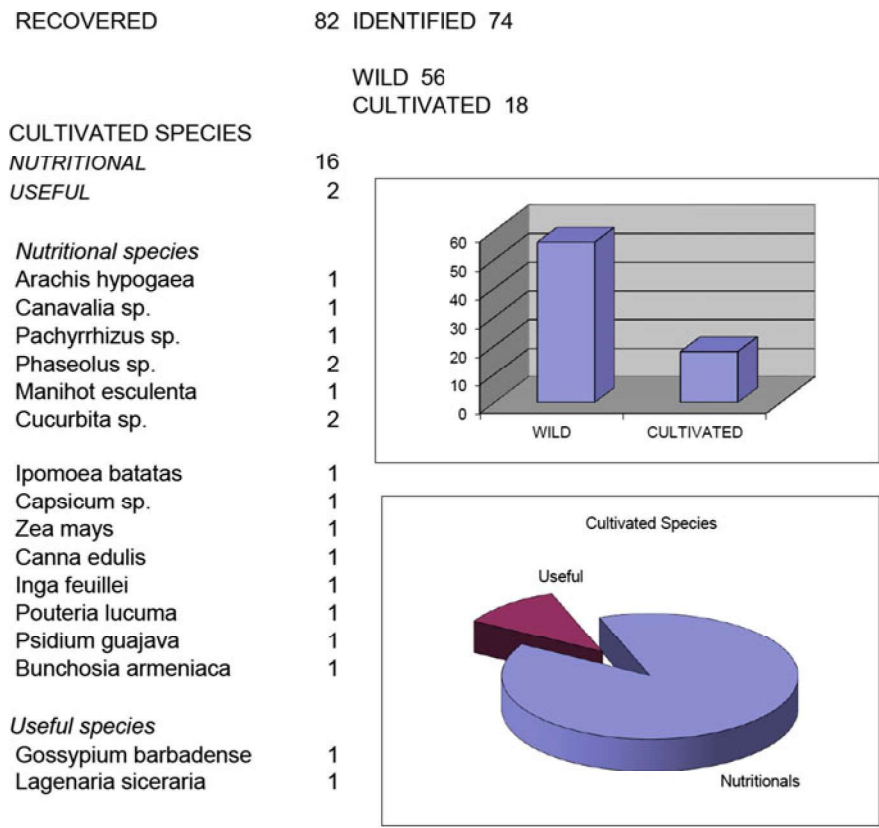


Fig. 6.2 Botanical species found at the ceremonial center of Cahuachi

liquids and food (Piacenza 2002). Another valued plant was the wingleaf soapberry (*Sapindus saponaria*), which was used as detergent and whose fruit and seeds, rich in saponin, were found as fillings inside the structures at Cahuachi.¹

6.3 Vegetable Foods

The art of cooking consists of the preparation, with the use of natural products, of food adequate to the nutritional needs of humans. It is difficult to find out how the forementioned vegetables were cooked in pots, because most of the botanical

¹*Boliche* or *choloque* (*Sapindus saponaria*) is included due to its importance in everyday life. Its peel contains saponine: a natural detergent which probably was used in personal cleaning as well as to wash cloths and clothes, for it is the sole ancient plant found in the excavations having these properties.



Fig. 6.3 Cahuachi. Utilitarian pottery (olla) placed as an offering in the base of the wall (Photo by Giuseppe Orefici)

remains come from ritual offerings. No remains of domestic garbage have been at Cahuachi, due to its nature as a religious center as opposed to a settlement where people usually lived and consequently produced cooking leftovers.

It has to be taken into account that only some domestic, intact pots were found at Cahuachi (Fig. 6.3), as well as various fragments, but without any evidence of their having been part of food containers. Only in some gourds can be found traces of purple color, perhaps left by the beverage prepared with purple corn (chicha).

There is no doubt that the Nasca people would have eaten the numerous agricultural products that are being found in excavations. But if we want to know how they were consumed, we must observe the fillings and platforms at the ceremonial center, where many roasted seeds can be found among the dispersed botanical remains. Roasting is a very ancient procedure whose purpose is to enhance the nutritional quality of products, for it enables carbohydrates to be transformed into sugary substances and prevents the fermentation of stored food. For instance, roasted seeds of maize, beans, and peanuts were found. Toasting was widely done, and it was probably the cause of tooth wear that has been noted by physicist anthropologists.²

²Tooth wear is noticeable, especially in molars, as it has been observed in numerous Nasca mummies. Tooth wear is the result, among other causes, of mastication of roasted seeds and the ingestion of molluscs because they normally contained sand traces. (Andrea Drusini, personal communication, August 2006).

Undoubtedly, maize was the most important product in Nasca agriculture. More than 70 kg of corn cobs and *corontas* (cobs whose kernels had been removed) that were retrieved from excavations justify its presence in iconography and emphasize its existence in the Nasca culture. What is more, corn cobs are the main components of the wells suited for offerings: their number varies from four or five cobs and up to 25.

The retrieved *corontas* weigh more than 60 kg. It is probable that many of them had been used in the preparation of chicha. The optimal conservation of the botanical remains has made possible recognition of some purple-colored cobs (Fig. 6.4).

The Nascas applied in maize cultivation the ancient practice of associating cereals with legumes, which was the basis of the development of various Pre-Hispanic Latin-American civilizations. Among the multiple advantages of said technique, the most important is the favorable influence on soil fertility, for it enables the addition of the nitrogen that cereals need. Moreover, maize provides support to legumes, as it has been showed in the research on maize-plant strata that were found in the excavations.

Trailing maize in importance, the most present and appreciated vegetable in the New World cultures is *aji* (*Capsicum frutescens*). This species is not only part of alimentation but also of the magical and religious traditions. Bernabé Cobo reports: “The most rigorous fast consisted in avoiding eating any stew that had ají as an ingredient” (Cobo 1891–1893; vol. IV, chapter XXV).



Fig. 6.4 Cahuachi. Offering of maize (Photo by Luigi Piacenza)



Fig. 6.5 Pueblo Viejo Sector X3 (Nasca). *Ají* depicted in Nasca ceramics. (Orefici 1992: 293, Fig. 35, drawing by Dolores Venturi)

The phytomorphic iconography represented in vessels depicts *ají* in all the phases of the Nasca culture (Figs. 6.5 and 6.6), generally associated with divinities of feline features and farmer characters. An interesting finding, due to its ritual meaning, was the three kilograms of *ají* fruits placed as an offering inside a pot that was retrieved in 1991 in sector Y1 Exp. 46.

With respect to legumes, they are highly important in tropical and sub-tropical regions for they provide the proteins necessary for a balanced diet. The Nascas cultivated two species of the genus *Phaseolus*: *Ph. vulgaris* (beans) (Fig. 6.7) and two varieties of *Ph. lunatus* (lima beans) (Fig. 6.8). In the offerings, seeds of these plants are found repeatedly and in various quantities. The standout is a burial with blankets and almost four kilograms of bean seeds that was found in 1998 in sector Y16 Exp. 67. This was the only finding of beans placed among eleven blankets richly woven and embroidered with Nasca iconography.

There are also other relevant bean offerings: one of almost seven kilograms and another one of more than one kilogram. These amounts represent 80% of the total of all seeds found. The remaining are grains that were retrieved from fillings and possibly were remains of former offerings.



Fig. 6.6 Cahuachi: handpieces of chilli offered in the *Pirámide Naranja* (Photo by Giuseppe Orefici)



Fig. 6.7 Beans legumes and seeds (Photo by Luigi Piacenza)

Peanut (*Arachis hypogaea*) was a very important legume oil seed in Nasca alimentation due to its high nutritional value. According to Paredes Carranza (1993), it contains 27.1% protein and 16.9% carbohydrates.



Fig. 6.8 Cahuachi. Nasca vessel decorated with motifs of pallares and legumes (Photo by Giuseppe Orefici)

Estrella (1986) points out that, due to its high content of niacin (21.6%), peanut “protects the organism against the emergence of a lacking disorder called pellagra”.

The Nascas also cultivated other legumes such as canavalia, generally known as lima bean of the gentile, meaning the ancestors. Its seed have been found in the raw state—and in a great number—inside the ritual wells (Fig. 6.9), roasted among leftovers or carbonized within stove ashes. Roasting was performed because the integument contains cyanogenetic glycosides, which limit nutrition (Bruno Ángeles 1990: 129). The Nascas roasted the seeds of canavalia, took off the external part, and ate the internal cotyledons. Nowadays, this plant is found in the wild and is quite unlikely to be part of human diets.

Another significant finding has been that of the small tubers of a wild herb, the chufa sedge or coquito (*Cyperus esculentus*), which were found in 2001 in sector Y1 Exp. 83 (Fig. 6.10a, b). Formerly, finding isolated tubers within leftovers was an indication that they were part of occasionally consumed wild resources. *Cyperus*, commonly known as “coquito” (Sagástegui and Leiva 1993: 483), is a cosmopolitan plant. Its small tubers have as sweet taste and are rich in starch. Duccio Bonavia adds that “these wild plants, which have multiple industrial uses besides being used as food, have been available for humans ever since the gatherer-hunter epoch” (Bonavia and Weir 1985: 116). The finding of 300 g of this tuber, mixed with approximately one kilogram of peanut and maize, and some cassava (*Manihot esculenta*), cooked and placed inside an ordinary cotton bag, confirms that coquito tubers were part of the Nasca diet. The peculiar finding of cultivated plants next to a



Fig. 6.9 Seeds of *Canavalia* (Photo by Luigi Piacenza)

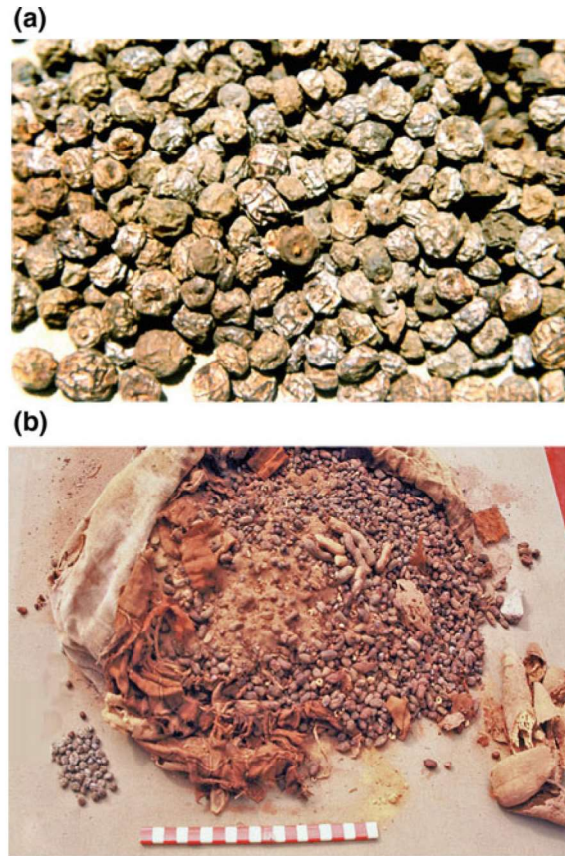
crop-invading plant demonstrates the coexistence of agriculture and wild-plant gathering.³

The root called *jiquima* (*Pachyrrhizus* sp.) (Figure 6.11) is also among the various tubers found. It is a legume which is frequently represented on Nasca ceramics and which attracted for the attention of botanist Eugenio Yacovleff (1933), who asserted that said plant was cultivated by the Paracas and the Nasca people. Its roots “are frequently found in the Paracas funerary fardos” (Yacovleff and Muelle 1934: 135), a hypothesis that was confirmed by their presence in archeological sites. It is depicted repeatedly in ceramics (Fig. 6.12) as well as Paracas and Nasca textiles, and even in the geoglyphs of the ritual space on the pampa of Nasca, which shows the high esteem that *jiquima* may have enjoyed within this culture (Fig. 6.13).

Cobo (1891) reports that *jiquima* “is sweet and watery, edible as a fruit and very refreshing in hot season”. Probably, this characteristic was well used by the Nasca people, who lived in such a dry and hot environment, and served as essential sustenance, particularly by those had to endure a long trips to the temples or

³Daniel Zohary asserts about this cosmopolitan vegetable that the small tubers of *cyperus* have been found in ancient Egyptian tombs (Zohary and Hopf 2000: 198). Also, Bresciani (1997: 37,45) contributes an Egyptian recipe for candies that were destined to the gods table and were processed with *cyperus* flour. In Europe, there is evidence of its cultivation for the preparation of food. Even today, in Valencia (southern Spain), the refreshing and nutritive beverage called *horchata de trufa* is prepared with the tubers of *Cyperus* sp.

Fig. 6.10 **a** Cahuachi, Sector Y15. *Cyperus* (coquito) tubercles. **b** Cahuachi, Sector Y1. Discovery of *cyperus* tubercles, mixed with peanuts and corns, roasted and placed in an ordinary cotton bag (Photos by Luigi Piacenza)



religious centers such as Cahuachi. Jíquima also appears on the list of agricultural products that were subject to taxes (Valverde 1865: 98) during the Conquest period, a fact that confirms its cultivation within said times. In contrast, this plant is almost unknown today.

The other plants that contain edible tubers are: cassava or “yuca” (*Manihot esculenta*), sweet potato (*Ipomoea batatas*) (Fig. 6.14), and achira (*Canna edulis*). Their tubers have been found in great numbers and in good preservation conditions inside the wells suited for offerings. Likely, that not all tubers had the same quality as food, but they surely satisfied the carbohydrate needs in the alimentation of the Nasca population. It is interesting to point out the lack of archeological remains of potato (*Solanum* sp.), for it was a very common tuber after the downfall of the Nasca culture.

The Nascas also cultivated fruits, which in general enjoy a major position among the religious offerings. Lúcura (*Pouteria lucuma*) (Fig. 6.15), apple guava (*Psidium guajava*), and plum (*Bunchosia armeniaca*), are typical plants of the Yunga region (Pulgar Vidal 1987: 57). Only their seeds and fragmented fruits were



Fig. 6.11 Cahuachi. Offering of jiquima tubers (Photo by Luigi Piacenza)



Fig. 6.12 Jiquima depicted in Nasca ceramics (Photo by Luigi Piacenza)

retrieved from the fillings, which probably were leftovers of the people living in Cahuachi and pilgrims who came from other areas. Also belonging to coastal fruits are the pacay (*Inga feuillei*) and the algarroba (*Prosopis pallida*) (Fig. 6.16).



Fig. 6.13 Jíquima figure in the Nasca Lines (Photo by web)

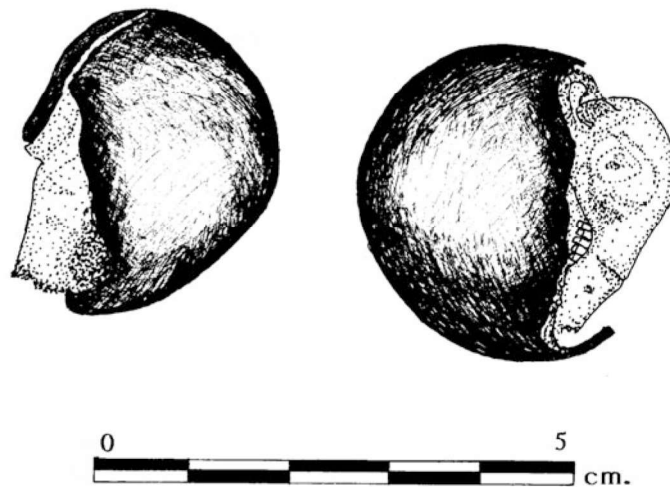
Their small branches, often with leaves, compose the fillings and embankments, and it is highly probable that they were picked in the surroundings of Cahuachi.

Also clearly evident is the massive and enigmatic presence of the fruit of an almost unknown tree: palillo (*Campomanesia lineatifolia*), which belongs to the Myrtaceae family (Fig. 6.17) and was described by Ruíz and Pavón in 1798 (Ruíz and Pavón 1957). The authors write that the indigenous name of the tree is *palillo*, like the fruit, and that it grows in maritime environments and in warm places in the Andes.

The aromatic fruits of palillo appear in almost all strata and levels of the excavations: they are found spread out or in clusters that can weigh more than two kilograms, such as the offering deposited in sector Y1 Exp. 4 (1986). In total, the fruits found weigh more than 16 kilograms, which places palillo among the most abundant vegetables that have been retrieved from the site (Fig. 6.18). Peculiarly, considering the amounts that has been found, so far palillo has not been identified in the Nasca iconography. Regarding its use, Ruíz and Pavón (1957) aver that Peruvian women used to place some of these fruits among flour due to their



Fig. 6.14 Cahuachi. Offering of sweet potato placed in the inside of a well (Photo by Luigi Piacenza)



CAH 88 - SECTOR Y2-EXP.28-Q2-Pozo 1-Olla.
PEPA DE LUCUMA CON CABEZA DE ROEDOR AL INTERIOR

Fig. 6.15 Cahuachi. Offering of lúcumá seeds with roedors trophy-heads inside (Drawing by Dolores Venturi)

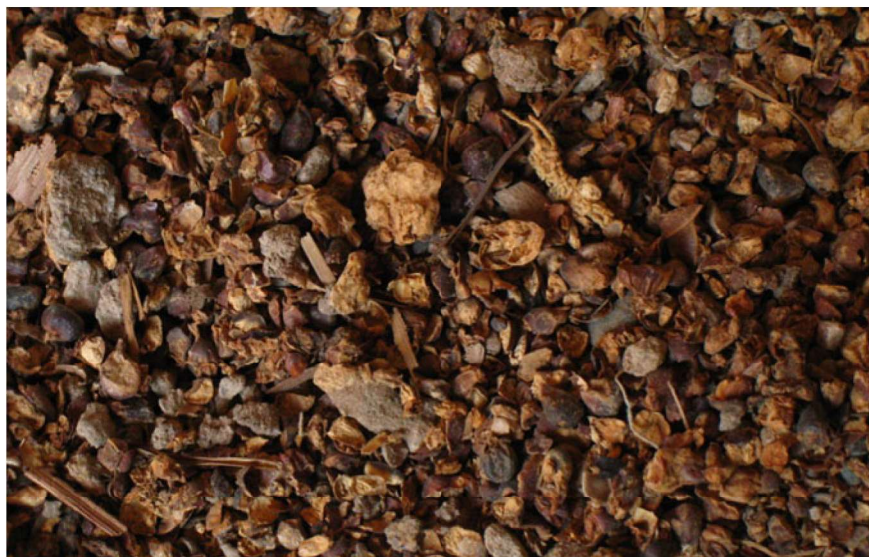


Fig. 6.16 Cahuachi. Algarroba seeds (Photo by Giuseppe Orefici)



Fig. 6.17 Cut palillo fruits (Photo by Luigi Piacenza)



Fig. 6.18 Cahuachi. Offering of palillo fruit. (Photo by Luigi Piacenza)

soothing aroma.⁴ This may be the reason for its presence, as an air freshener in the internal areas of structures.

6.4 Healing and Magical Plants

The Nasca people selected plants based on their primary needs. Diseases are part of the human condition and can be alleviated with the use of a great variety of natural products such as those found in plants. Over time, the ingenuity of humans—their wisdom and culture—were able to recognize the healing plants and so started using

⁴“Virus et usus: Fructus, quos peruviana Feminae in forum mixtura odoris suavitate frequenter apponunt, lutei et edules sunt” (Ruiz and Pavón 1798: 128; 1957: 197). It is obvious that the name *palillo* is a Hispanicism. It seems that over time this species lost both its native name and its effective cultural presence. Soukop (1987) reports, in the vocabulary he researched, the vocable *suana* and related to *palillo*. Cobo (1890, V: 455) explains that *suana* is a root used to dye food yellow. Nowadays, the name *palillo* identifies a non-native plant, the curcuma (Zingiberaceae). Weberbauer (1911: 230) located in the upper Amazon rainforest the ecological stratum where *Campomanesia lineatifolia* grows. Raimondi (1942: 4) lists *Campomanesia* sp. among the vegetation that he could only find on the Tarma-Chanchamayo route he traveled in 1855. It seems that nowadays the arid Peruvian coast does not favor the natural growth of said plant.



Fig. 6.19 *Sampedro* cactus depicted in Nasca ceramics (Photo by Luigi Piacenza)

them. Among the retrieved samples of spontaneous flora, several species belonging to pharmacopeia were identified: mallcu or altamisa (*Ambrosia peruviana*), cimarrón tobacco (*Nicotiana paniculata*), chilca (*Baccharis lanceolata*), American nightshade (*Solanum americanum*), jimson weed or chamico (*Datura stramonium*), prickly poppy (*Argemone subfusiformis*), and *Sampedro* (*Echinopsis* sp.). The latter belongs to the Cactaceae family and was used in the magical rituals by priests in order to contact supernatural entities. This cactus has a long cultural history which dates back to the mythical times of the Chavín de Huántar divinities, a ceremonial site where an engraved stele depicts a priest handling an unmistakable *sampedro*. In the excavations at Cahuachi were found abundant samples of this cactus and also ceramics representing the *sampedro* (Orefici and Drusini 2003: 116) (Figs. 6.19 and 6.20).

All the found samples have been studied by the cactus specialist Carlos Ostolaza (Ostolaza and Piacenza 2002: 22), with the purpose of determining the species that the Nasca people had at their disposal. Ostolaza assures us that the botanical name of *sampedro* not only applies to *Trichocereus pachanoi*, but also to *Echinopsis peruviana*. Cabieses (1993) has published studies on the chemical components of *sampedro* (*Echinopsis* sp.) and the mental effects produced on people who use it.

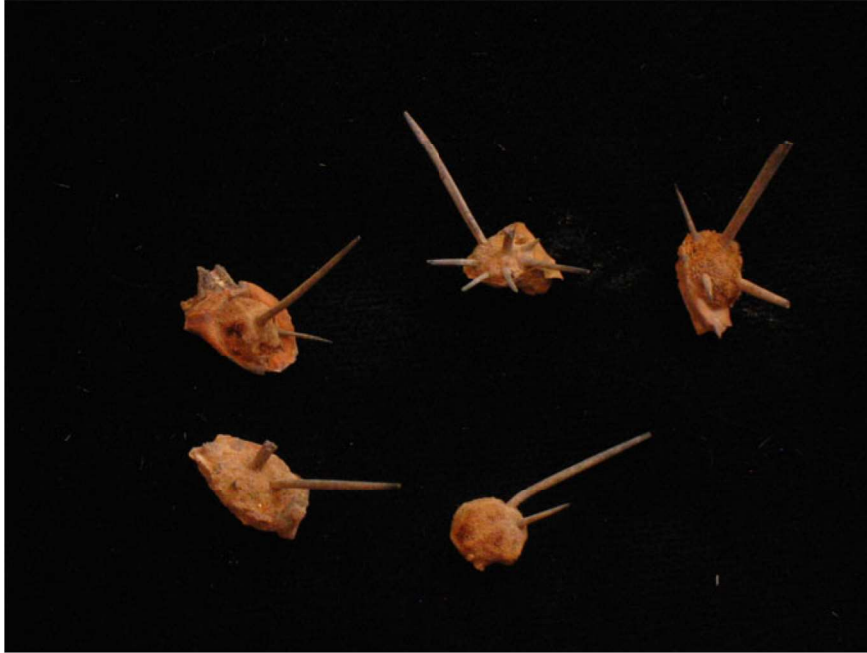


Fig. 6.20 Cahuachi. Remains of cactus sampedro spines. (Photo by Giuseppe Orefici)

Among the healing plants recognized and retrieved from excavations, there are other species that are not referred to in this chapter, for they were not cited in the historical sources herein consulted.

6.5 Final Remarks

This study aims to point out the purposes for the agricultural products (Fig. 6.21) used by the Nasca people: they were offered in their raw state as a ritual offering to their divinities, and cooked and placed in containers were offered to their dead as a symbol of the food they liked the most when they were alive.

In conclusion, we believe that at Cahuachi, the Nascas wanted the divinities that ruled the development of nature to favor their crops, as well as their own survival. Hence, they bestowed on their divinities offerings agricultural products that were considered among the best they had harvested. According to Rostworowski De Diez Canseco (1976), “the importance of a temple was measured by the adoration that their divinities inspired and by the offering bestowed by the faithful”. In that sense, it can be assured that Cahuachi, given the amount of the offerings that were found there—the weight of the retrieved vegetables surpasses 250 kg—might indeed have been highly esteemed as objects of deep devotion and worship by the

ESPECIES / SPECIES	POPULAR	QUECHUA	AYMARA
<i>Echinopsis peruviana</i> (Br. y R.) Friedrich y Rowley	Sampedro / Sampedro cactus	Ahuakolla	Ahuakolla
<i>Argemone subfusiformis</i> Ownb.	Cardosanto / Prickly poppy		
<i>Arachis hypogaea</i> var. <i>peruviana</i> Krap. y Gregory	Maní / Peanut	Chocopa	Chocopa
<i>Canavalia plagiisperma</i> Piper	Pallar de los gentiles / Jack-bean		
<i>Inga feuillei</i> DC	Pacae / Pacay	Pacaya	Pacaya
<i>Pachyrhizus tuberosus</i> (Lam.) A. Spreng.	Jíquima / Jicama	Villu	Villu
<i>Phaseolus</i> sp.	Poroto / Bean	Purutti	Purutti
<i>Phaseolus lunatus</i>	Pallar / Lima bean		
<i>Prosopis pallida</i> (H&B ex Will.) H.B.K.	Algarrobo / Algarroba		
<i>Manihot esculenta</i> Krantz	Yuca / Cassava		
<i>Bunchosia armeniaca</i> (Cav.) DC.	Ciruela del fraile / Plum	Husum	Husum
<i>Sapindus saponaria</i> L.	Choloque, Boliche / Wingleaf soapberry		
<i>Gossypium barbadense</i> L.	Algodón / Cotton	Qhuesa,	Qhuesa,
<i>Bixa orellana</i> L.	Achiote / Achiote	Wanturu	Wanturu
<i>Cucurbita maxima</i> Duch.	Zapallo / Squash	Loche	Loche
<i>Cucurbita moschata</i> Duch.	Lacayote / Butternut squash	Yoko	Yoko
<i>Lagenaria siceraria</i> (Mol.) Standl	Mate / Bottle gourd		
<i>Campomanesia lineatifolia</i> (Ruiz y Pavón)	Palillo / Palillo		
<i>Psidium guajava</i> L.	Guayaba / Apple guava		
<i>Pouteria lucuma</i> (Ruiz y Pavón) O. Kuntze	Lúcuma / Lúcumá	Lukhuma	Lukhuma
<i>Ipomoea batatas</i> (L.) Poir	Canote / Sweet potato	Apichu	Apichu
<i>Capsicum frutescens</i> L.	Aji / Aji	Uchu	Uchu
<i>Datura stramonium</i> L.	Chamico / Jimson weed		
<i>Solanum americanum</i> (L.) Mill.	Hierba mora / American nightshade		
<i>Ambrosia peruviana</i> Willd.	Altamisa / Altamisa	Marcu	Marcu
<i>Baccharis lanceolata</i> (L.) Kunth	Chilca / Chilca		
<i>Zea mays</i> L.	Maíz / Maize	Çara	Çara
<i>Cyperus esculentus</i> var. <i>leptostachyus</i> Boeck, L.	Coquito, Chufa / Chufa sedge		
<i>Canna edulis</i> Ker. Gawl	Achira / Achira		

Fig. 6.21 Taxonomic list of the botanical species of the Nasca people

multitude who came to implore the divinities for favors. According to Rösing (1994: 191), the latter is a realization of what can be defined as a reciprocity relationship: “Humans look for the encouragement and reconciliation with the supernatural entities by means of rites and offerings, which is a way of exchange, that is, of reciprocity: I give you something and you give me something back. Given that all human beings wish something from the divinities, the latter have the power over everything that matters to humans, and according to the value of reciprocity they have to give something back to the divinities. So they bestow offerings”.

However, when the forces of nature—despite the invocations and offerings—destroyed Cahuachi with a huge mudslide (huayco), the survivors had nothing to do but to seal the religious center, but not before performing the great ritual offering of camelids.

References

- Bonavia D, Weir GH (1985) Coprolitos y dieta del precerámico tardío de la costa peruana, in Boletín del Instituto Francés de Estudios Andinos, Tomo XIV, n. 1–2: 85–140 (Lima)
- Bresciani F (1997) La Cultura Alimentare degli egiziani antichi, in: Storia della Alimentazione, a cura de: Jean Luis Flandrin, Massimo Montanari: 37–45, ed. Laterza, Roma
- Bruno Ángeles J (1990) Leguminosas Alimenticias, ed. auspiciada por el Consejo Nacional de Ciencia y Tecnología. FRAELE, Lima
- Cabieses F (1993) Apuntes de Medicina Tradicional, la racionalización de lo irracional. Consejo Nacional de Ciencias y Tecnología. CONCYTEC, Lima
- Cobo B (1890–1893) Historia del Nuevo Mundo, 4 vol., estudio y notas de Marco Jiménez de Espada. Ed. de la Sociedad de Bibliófilos Andaluces, Sevilla
- Estrella E (1986) El Pan de América. Consejo Superior de Investigaciones Científicas (CSIC), Madrid. (II. Edición. Quito: Ed. Abya-Yala, 1988; III Edición. Quito: Ed. Abya-Yala, 1990)
- Orefici G (1992) Nasca. Archeologia per una ricostruzione storica. Jaca Book, Milano
- Orefici G, Drusini A (2003) Nasca: Hipótesis y evidencias de su desarrollo cultural. Serie Documentos e Investigaciones n. 2, Ed. Centro Studi e Ricerche Archeologiche Precolombiane, Brescia -Italia
- Ostolaza G, Piacenza L (2002) Cahuachi y la Cultura Nasca, in Quepo. Sociedad Peruana de Cactus y Suculentas, vol 16. Ed. Carlos Ostolaza Nano, Lima
- Paredes Carranza C (1993) Nutrición: fundamentos bioquímicos, fisiológicos y clínicos. CONCYTEC, Lima
- Piacenza L (2002) Evidencias Botánicas en Asentamientos Nasca. Boletín de Museo de Arqueología y Antropología de la Universidad Mayor San Marcos, Año 5, n. 1: 3–13, Lima
- Piacenza L (2003) Las ofrendas de vegetales en el Centro Ceremonial de Cahuachi, en: Il sacro e il paesaggio nell'America indigena.: 309–317, Colloquio Internazionale Bologna, D. Domenici, C. Orsini, S. Venturoli, compilatori. Ed. CLUEB, Bologna
- Pulgar Vidal J (1987) Geografía del Perú: las Ocho Regiones Naturales. PEISA, Lima
- Raimondi A (1942) Notas de viajes para su obra “El Perú”, 1 Vol. Ed. Torres Aguirre, Lima
- Rösing I (1994) La deuda de ofrenda: un concepto central de la religión andina. Revista Andina n. 1: 191–215, Centro de Estudios regionales andinos “Bartolomé de las Casas”, Cusco
- Rostworowski De Diez Canseco M (1976) Reflexiones, sobre la reciprocidad Andina. Revista del Museo Nacional, XLII: 341–354, Lima
- Ruiz H, Pavon J (1957) Flora Peruviana et Chilensis. Anales Instit. Bot. A.J. Cavanilles 14 (4):196–197 (Madrid)
- Sagástegui AA, Leiva SG (1993) Flora invasora de los cultivos del Perú, Consejo Nacional de Ciencia y Tecnología, Ed. Libertad EIRL, Trujillo, Perú
- Soukop J (1987) Vocabulario de los nombres vulgares de la Flora Peruana y catálogo de los géneros. Editorial Salesiana, Lima
- Valverde VF (1865) [1539], Carta dirigida al Emperador Carlos V, en Documentos inéditos del Archivo de Indias, Tomo III: 92–137. Ed. M. B. Quiros, Madrid
- Weberbauer A (1911) El mundo vegetal de los Andes Peruanos. Ministerio de la Agricultura, Lima
- Yacovleff E (1933) La Jíquima, raíz comestible extinguida en el Perú, Revistas del Museo Nacional 3: 51–65, Lima
- Yacovleff E, Muelle J (1934) Un fardo funerario de Paracas, Revistas del Museo Nacional 1–2: 135, Lima
- Zohary D, Hopf M (2000) Domestication of plants in the old world. The origin and spread of cultivated plants in West Asia, Europe and the Nile Valley. Oxford University Press