

ARQUEOLOGÍA MOCHICA NUEVOS ENFOQUES



EDITORES

Luis Jaime Castillo Butters

Hélène Bernier

Gregory Lockard

Julio Rucabado Yong

Capítulo 24



ACTAS DEL PRIMER CONGRESO INTERNACIONAL DE JÓVENES INVESTIGADORES DE LA CULTURA MOCHICA



INSTITUTO FRANCÉS DE ESTUDIOS ANDINOS
UMIFRE 17, CNRS-MAEE



PONTIFICIA **UNIVERSIDAD CATÓLICA** DEL PERÚ

**FONDO
EDITORIAL**

Arqueología Mochica: nuevos enfoques
Primera edición: mayo de 2008

© Luis Jaime Castillo Butters
Hélène Bernier
Gregory Lockard
Julio Rucabado Yong

De esta edición:

© Fondo Editorial de la Pontificia Universidad Católica del Perú, 2008
Av. Universitaria 1801, Lima 32 - Perú
Teléfono: (51 1) 626-2000
feditor@pucp.edu.pe
www.pucp.edu.pe/publicaciones

© Instituto Francés de Estudios Andinos, 2008
Av. Arequipa 4595, Lima 18 - Perú
Teléfono: (51 1) 447-6070
Fax: (51 1) 445-7650
postmaster@ifea.org.pe
www.ifeanet.org

Este volumen corresponde al tomo 21 de la Colección «Actes & Mémoires de l'Institut Français d'Études Andines» (ISSN 1816-1278)

Crédito de fotografía: Pieza escultórica mochica, Museo Rafael Larco Herrera
Fotógrafo: Carlos Ausejo

*Prohibida la reproducción de este libro por cualquier medio,
total o parcialmente, sin permiso expreso de los editores.*

ISBN 978-9972-42-836-4
Hecho el Depósito Legal en la Biblioteca Nacional del Perú N.º 2008-04854

Impreso en el Perú - Printed in Peru

MOCHE BEAN WARRIORS AND THE PALEOBOTANIC RECORD: WHY PRIVILEGE BEANS?

Gail Ryser*

*In complex societies, political ideologies are expressed through mechanisms such as iconography, subsistence base, and non-secular institutions. The distribution of subsistence crops and iconography in particular are influenced by shifts within the political economy. This study examines the correlation between lima beans (*Phaseolus lunatus*) in Moche (ca. A.D. 100-800) iconography and botanical remains. Moche iconography of natural and anthropomorphized lima beans is compared with archaeological botanical evidence to evaluate changing patterns of use and a possible link between Moche political economy and ideology. These data, together with information on the phytochemical properties of lima beans, suggest that changes in the subsistence use of lima beans were related to changes in Moche political economy. It is argued that the Moche political economy influenced the socially constructed cuisine preferences of lima beans.*

*En sociedades complejas las ideologías políticas se expresan a través de variados mecanismos, tales como la iconografía, la base de subsistencia y las instituciones no-seculares. La distribución de los cultivos de subsistencia y la iconografía están particularmente influenciadas por los cambios en la economía política. Este estudio examina la correlación que existe entre los pallares (*Phaseolus lunatus*) en la iconografía moche (ca. 100-800 d.C.) y los restos botánicos, a fin de evaluar cambios en los patrones de uso y una posible relación entre la economía política y la ideología moche. Estos datos, junto con la información relacionada con las propiedades fitoquímicas de los pallares, sugieren que los cambios en el uso de los pallares para el sustento humano estuvieron relacionados con los cambios en la economía política moche. Se propone entonces que la economía política moche influyó en las preferencias culinarias, socialmente construidas, en favor de los pallares.*

In complex societies, changes in iconography can reflect social changes that result from shifts in political and religious institutions. The study of iconography can advance understanding of shifts in political and religious institutions, particularly when ideologically driven iconography develops after political authority becomes institutionalized. Moche iconography is a prime candidate for this kind of study because of its widely recognized realistic (albeit sometimes stylized) images depicting objects available in the immediate environment, secular and non-secular activities, and the natural and spiritual landscape (e.g., Benson 1972; Donnan 1978).

Subsistence patterns and the use of particular foods are also affected by sociopolitical changes. Because plants and food are involved in political processes through ceremony, ritual, and civic activities (Delibes and Barragán, this volume; Hastorf 1993), they are susceptible to sociopolitical pressures and change. Increased crop production for

political activities and exchange (Hayden 1990) and sanctions and taboos (Meigs 1997:95) are behaviors that leave archaeological evidence.

Socially constructed food and cuisine preferences are archaeologically evident from distribution patterns (Gumerman 1991). The persistence of certain plants in the archaeological record attests to their economic and social importance. Politically motivated change will affect social and economic processes, for instance, as the demand for tribute and ritually significant or subsistence crops increases or changes. The absence of available resources should not be discounted, as both the presence and absence of a resource reflect specific characteristics of society. Species presence/absence is often the result of differential preservation. Evidence of change in plant use over time, however, can be the result of variation in resource availability and/or a combination of cultural choices such as assigned value, preference, and taboos (Hastorf 1999:37; Pearsall 1989).

* Universidad Estatal de Arizona. Correo electrónico: gryser@asu.edu.

This paper examines Moche (ca. A.D. 100-800) iconography of lima beans (*Phaseolus lunatus*) and the archaeological distribution patterns of these beans at sites in the Moche and Chicama valleys on the North Coast of Peru. Some scholars identify beans in Moche iconography as *pallares*, or lima beans, based on morphological characteristics and stylistic expression, a convention that is followed here (e.g. Larco 1939; Yacovleff and Herrera 1934). Together, iconography and archaeological distribution patterns suggest politically and ideologically driven change in the economic use of lima beans during the Moche Period. Modern studies involving a non-nutritional factor of the lima bean plant are considered as supporting evidence for a socially constructed non-subsistence classification of beans by the Moche.

Numerous studies indicate that plant use linked to indigenous knowledge will vary depending on local customs, taboos, and rituals (e.g., Bynum 1997:137; Harris 1997:78; Sharon and Donnan 1977). Recent research in the Andean region suggests that the local customs involving lima beans (*Phaseolus lunatus*) during the Moche Period dictated use outside the domestic subsistence base (Ryser 1998, 2002). The transformation of the lima bean from an economically valued crop to a ritually significant plant is suggested by its archaeological distribution and the change through time of its depiction in Moche iconography. The iconographic transition of the lima bean from its natural form to a bean warrior over time, in conjunction with archaeological botanical evidence, suggests that the lima bean was affected by changes in socially defined categories of economic and ideological classification (Ryser 1998). But why were beans associated with Moche warriors – a social class who appears to have played a vital role in Moche social order?

To examine this question, several lines of evidence are presented that illuminate changes in cultural preference and the use of lima beans. First, botanical data collected from several coastal sites will establish patterns of bean distribution through time. This is followed by an introduction to bean iconography in Moche ceramics. Lima bean motifs (repeated

designs or patterns) are present in several contexts in Moche iconography; I focus on primary images of natural beans and anthropomorphic motifs of bean warriors in Moche ceramics. Finally, a discussion of modern studies related to the non-nutritional component HCN provides one possible explanatory link in an emerging pattern between changing economic patterns and Moche ideology.

Phaseolus sp. and the Archaeological Record

Plants are used to express social and ethnic identity. Food preferences, preparation methods, and cuisine may symbolize ethnicity, social status, and/or gender relations (e.g., Douglas 1966; Gumerman 1997:114). The use of plants (e.g., subsistence vs. medicinal) and the context in which they are used (e.g., secular vs. non-secular) is culturally constructed (e.g., Meigs 1997) and often reflects cultural background. The Andean archaeological record indicates that certain plants, such as cotton and gourds, were important in the development of coastal societies, and other plants, such as chili peppers and guava, probably contributed to emerging ethnic differences (Hastorf 1999:37, 63). In Peru, the early co-existence of beans (*P. vulgaris* and *P. lunatus*) and chili peppers (*Capsicum* spp.) at the Preceramic site of Guitarrero Cave, located in the Callejón de Huaylas, has been interpreted to mean that they were under full domestication by 8000 B.C. (Smith 1980:111; Kaplan 1980, 1981). Beans were the most common crop in coastal Preceramic sites from 6000 to 4200 B.C., eventually becoming widespread throughout the coastal region by the Initial Period (ca. 1800-1000 B.C.) (Hastorf 1999: 45-51). On the North Coast, beans have been recovered from the earliest levels at the Preceramic site of Huaca Prieta in the Chicama Valley (Bird and Hyslop 1985:233) and from the Initial Period site of Gramalote in the Moche Valley (Pozorski 1976:97). Because beans of all kinds (e.g., *Phaseolus* spp. and *Canavalia* spp.) are highly susceptible to taphonomic processes and, unlike maize, are consumed in their entirety, the archaeological presence of beans is actually quite remarkable.

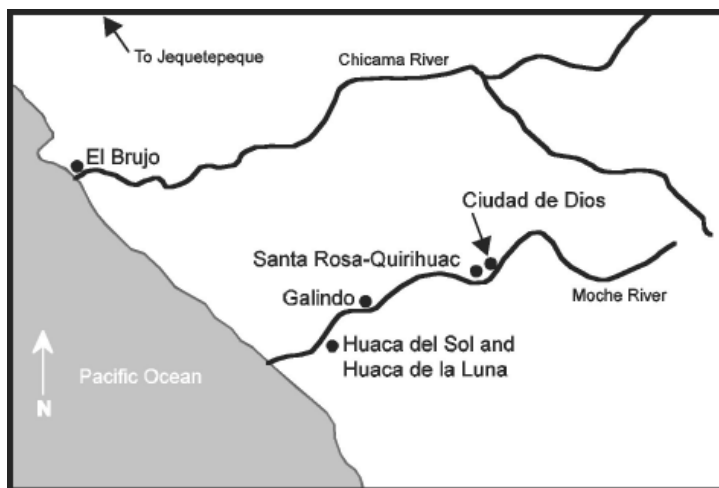


Figure 1. Moche sites referenced in the text.

Paleobotanic Data

In this study, botanical data collected from various contexts (domestic hearths and middens, room floors, and ash dumps) during excavations at four sites are used to evaluate economic change during the Moche period. These sites are Santa Rosa-Quirihuac, Ciudad de Dios, and Galindo in the Moche Valley, and the Complejo El Brujo in the Chicama Valley (figure 1). Data from test pit samples are also used to establish general economic use of beans for the Cupisnique (Initial Period) and Chimú (Late Intermediate Period) occupations at the Complejo El Brujo.

The chronological scheme applied to the ceramics analyzed in this study (see below) is based on the sequence developed by Larco Hoyle (1948) that divides stirrup spout vessels into five phases (I-V) based on morphological variation. This study accepts the documented chronological association that has been assigned by others to the ceramic vessels in the sample. Because it is difficult to correlate these stylistic phases to broader sociopolitical changes, the chronological association of the botanical samples is assigned using the following broader archaeological periods: Early Moche (Phases I and II), Middle Moche (Phases III and IV), and Late Moche (Phase V).

Excavations at all sites concentrated in non-monumental and non-elite occupation areas. In all cases, systematic sampling included passing excavated matrix through nested screens ranging in size from 1/4 inch to 0.5 millimeters.

The Moche Valley sites are all situated outside the reaches of modern agriculture. Data were collected from Santa Rosa-Quirihuac and Ciudad de Dios during the Moche Valley Archaeological Project (Gumerman and Briceño 2003).¹ Santa Rosa-Quirihuac dates to the Early Moche Period (Gumerman and Briceño 2003:225), and Ciudad de Dios dates to the Middle Moche Period (Gumerman and Briceño 2003:235). The Late Moche Period is represented by samples from Galindo recovered during the Galindo Archaeological Project (Lockard 2005, this volume).²

The architectural elaboration and ceramic data from Santa Rosa-Quirihuac suggest that the site had a short occupation during the Early Moche Period, with no apparent socioeconomic differences among site occupants. Samples were collected from room floors, living surfaces, hearths, and ash dumps (Gumerman and Briceño 2003:220-221).

At Ciudad de Dios, the site's resident population was stratified and probably included specialists (Gumerman and Briceño 2003:233-239). Ceramic

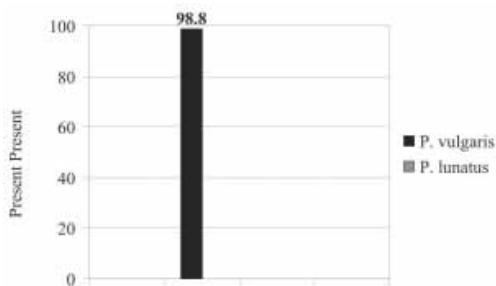


Figure 2. Distribution of *Phaseolus* spp. from Moche samples (n=344).

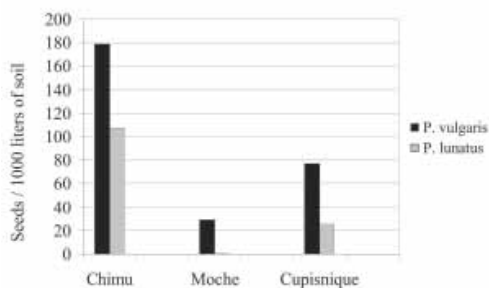


Figure 3. Standardized density of bean distribution in the LIP (Chimu), EIP (Moche), and IP (Cupisnique) levels at the Complejo El Brujo.

refuse contained plain and fine wares. Architecture included stone and adobe construction. The abundance of agricultural tools and large grinding stones imply farming activities. Food production may have benefited non-household producers. Samples were collected from midden contexts, room floors and benches, hearths, and ash deposits (Gumerman and Briceño 2003:235).

Galindo was the largest site in the Moche Valley during the Late Moche Period, rising to eminence as the center of residential occupation and political administration after the Huacas de Moche became a specialized ceremonial site (Bawden 1996:286). Architectural elaboration, size, and location suggest status inequality among the resident population of Galindo (Bawden 1996:288). Recent investigations at Galindo have provided samples from Late Moche domestic contexts (Lockard 2005).

The Complejo El Brujo, located in the Chicama Valley, is a multi-component site characterized by several monumental structures. These include the Huaca Prieta, which dates to the Preceramic Period, and the Huaca Cao Viejo, which dates to the Moche Period. Located on the windward side of the Huaca Cao Viejo are several contiguous areas with known Moche domestic architecture. Samples were collected from two of these areas as part of the Moche Foodways Archaeological Project.³ The first, Las Paredones, dates to the Early Moche Period and consists of a small group of contiguous rooms that are visible on the surface today (Régulo Franco, personal communication 1998). The second, Las Tinajas, is comprised of several compounds containing contiguous room blocks of domestic and other use, in addition to a small platform mound, and dates to the Middle Moche Period. Samples were collected from hearths, room floors, and middens. Several samples were also collected during limited testing in a domestic activity area on the Huaca Cao Viejo.

Paleobotanic Data Summary

Analysis of soil samples collected from the four sites yielded 344 whole beans (dicotyledons) or bean fragments (cotyledons or smaller fragments with morphological characteristics adequate for species identification). Bean fragments without identifiable features were not considered in this study. 340 specimens (99 percent) are common beans (*Phaseolus vulgaris*). The remaining four (1 percent) are lima beans (figure 2). These four lima beans were recovered from over 11,700 liters of screened sediment. One of these is a whole seed (dicotyledon) recovered from the Early Moche site of Santa Rosa-Quirihuac. No lima beans were recovered from Ciudad de Dios (Gumerman and Briceño 2003:236-337). The remaining three lima bean fragments were recovered from a hearth in the Las Tinajas area. At the time of this writing and analysis, no lima beans had been identified in the samples from Galindo (Gregory Lockard, personal communication 2004; see also Pozorski 1976).⁴

The scarcity of lima beans in the samples analyzed in this study raises the question of why a plant with

such a long dietary history is not evident in the archaeological record in an expected manner at Moche sites. The observation is more intriguing when data from Cupisnique and Chimú occupations at the Complejo El Brujo are examined. Samples collected as part of a site-wide testing indicate that the Initial and Late Intermediate Period occupation levels have a significantly greater prevalence of lima beans than the Early Intermediate Period (i.e., Moche) levels (figure 3). These results are based on standardized density of beans per 100 liters of excavated soil. The Moche dietary regime contained a variety of plants including chili peppers (*Capsicum sp.*), squash (*Cucurbita sp.*), lucuma (*Pouteria lucuma*), avocado (*Persea americana*), common beans (*Phaseolus vulgaris*), and maize (*Zea mays*) (Gumerman *et al.* n.d.; Hough 2000; Pozorski 1976:123-124). The presence of common beans from all sites represented in this study indicates that preservation is not an issue in the distribution pattern of lima beans. Rather, the conspicuous absence of lima beans in the Moche samples suggests a conscious decision about how the bean plant was used. Changing socio-symbolic activities (e.g., burial patterns; see Donley, this volume) and changing iconographic representations and motifs on Moche fineline ceramics suggest political changes within Moche society. Political explanations for changes in culinary practices and the manner in which society classified and used food during the Moche Period is indicated by the distribution pattern in botanical samples and the transformation of bean imagery in Moche iconography. The following section presents a general overview of previous research on bean iconography in Moche art, and identifies the methods that were utilized to isolate the iconographic representations of beans analyzed in this study.

Bean Iconography

The visual arts of the Moche Period have been the focus of research for decades (e.g., Benson 1972; Donnan 1976; Kutscher 1983; Larco 2001). In particular, the correlation between ceramic fineline paintings and archaeological evidence has inspired new questions about the relationship between Moche

political organization and iconography (e.g., Alva and Donnan 1993). Following this inquiry, the present study focuses on the correlation between the archaeological record and the depiction of lima beans in Moche iconography, and what this relationship informs us about Moche political and economic organization.

Beans are easily found in the corpus of Moche art, although anthropomorphized plant images are less common (e.g., Donnan 1976; Donnan and McClelland 1999; Kutscher 1983; Larco 2001 and Yacovleff and Herrera 1934) but do exist (Hoquenghem 1987:107). In this study, I follow previous researchers that classify beans in Moche iconography as *pallares* (i.e., lima beans) based on morphological features including lunar shape and seed coat markings, yet acknowledge that this perspective is debated (e.g., Dobkin de Rios 1977:200; Friedberg and Hocquenghem 1977:53; Hocquenghem 1984:403-404, 1987:145; Segundo Vasquez, personal communication 1999; and Yacovleff and Herrera 1934). Other scholars use the term *frijoles*, which implies the common bean (*Phaseolus vulgaris*), *frijoles* in conjunction with *pallares* (e.g., Hocquenghem 1987:106-109), or make no species distinction (e.g., Nieves 1996) when classifying these objects.

In the following discussion, reference to beans will mean lima beans unless otherwise stated, although some references cited do not clarify species (e.g., Nieves 1996). Bean icons range from a single ceramic bead to decorations on or associated with animals (e.g., frogs and deer, respectively). They are primarily represented in two kinds of motifs – natural forms (figure 4) and anthropomorphized warriors (figure 5). The latter are identifiable based on attire, accouterments, and body decoration consistent with Moche warriors (Alva and Donnan 1993; Nieves 1996). There is a small corpus of images that depict the transformation of a bean into a human form engaged in running (Nieves 1996). Other running themes associated with beans include scenes involving men racing each other. Both natural and anthropomorphized motifs decorate fineline ceramics. They are most commonly painted on the chambers, stirrups, and spouts of stirrup spout

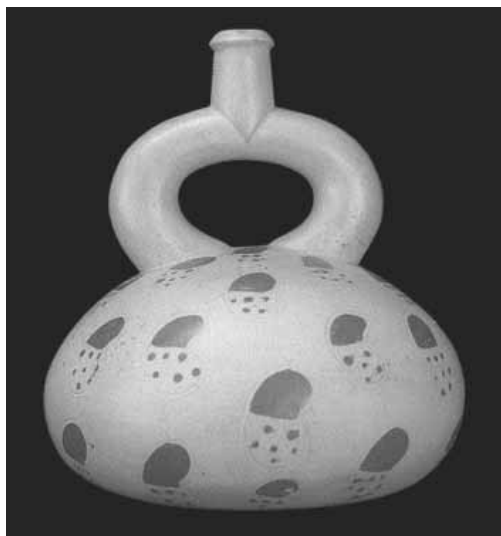


Figure 4. An example of natural beans (after Donnan and McClelland 1999: 32, Fig. 2.17).

bottles, but also decorate other vessel forms, such as *floreros*. Beans are also rendered in three-dimensional forms as ceramic «portrait» vessels. In these vessels, a bean seed (dicotyledon) is transformed into the likeness of a human face adorned with characteristic Moche warrior accouterments (figure 6) or a human face appears in place of the hilium (i.e., where the seed attaches to the pod).

Scholars who have examined the bean motif have developed various theories regarding its significance or meaning. They have been interpreted to represent writing and communication (Larco 1942, 1943), agricultural cycles (Hocquenghem 1984, 1987), games (Arsenault 1987; Vivante 1941; 1942), divination associated with the agricultural calendar (Hoquenghem 1987), and activities related to war operations (Bourget 1989:98). They have also been interpreted as being associated with shamans and connected with the spirit familiars evoked during ritual activities (Dobkin de Rios 1977).

Bean motifs, however, are generally assigned to basic metaphors of life and death – whether tied to cycles of agriculture representing life, or death events through relationships to warriors. Nieves' (1996) systematic iconographic analysis of bean motifs



Figure 5. An example of an anthropomorphized bean warrior (after Kutscher 1983).

expands on previous theories that argue that bean images constitute a narrative showing different aspects of the same event – a rite of passage ceremony involving men racing each other to become warriors. According to Nieves (1996:61), beans therefore signify incipient transformation – the warrior as bean has the capability to transform life. Among other obligations, Moche warriors had a privileged role in the cycle of ritual reproduction by providing captives for sacrifice (Alva and Donnan 1993; Benson 1972). Nieves concludes that the bean motif was a metaphor for life itself, symbolizing the «warrior's perpetuation of the life cycle through participation in ritual and warfare» (1996:65).

Because this research followed closely on the heels of Nieves' study, the classification system of natural and anthropomorphized lima bean images used by her is loosely followed here. This analysis, however, focused on whether the images changed through time and, if so, whether this variation was related to economic change, rather than understanding *per se* the meaning of the images. In addition to Nieves' classification system, the current analysis incorporated a secondary classification scheme to isolate particular examples of lima bean motifs. According to McClelland (1977:441), the Moche artistic style contains primary (figure 7B) and secondary images (figure 7C). Primary images are identified on the basis of size and independence (i.e., by removing secondary, smaller elements the action portrayed by the primary image remains identifiable as an independent element;



Figure 6. An example of a bean warrior portrait vessel (from Museo Larco e-catalog 2002).

compare figures 7A, 7B and 7C). Size may imply importance of the image, and size variation may suggest dimension or distance (i.e., closer objects larger than distant ones). Based on the concept of independent element, this analysis utilized images and motifs of natural forms and anthropomorphized lima bean warriors classified as primary images.

Bean Iconography Summary

The sample for this study ($n=73$) is comprised of primary images from an extensive literature review (Benson 1972; Calkin 1953; Donnan 1976, 1978; Donnan and McClelland 1999; Hocquenghem

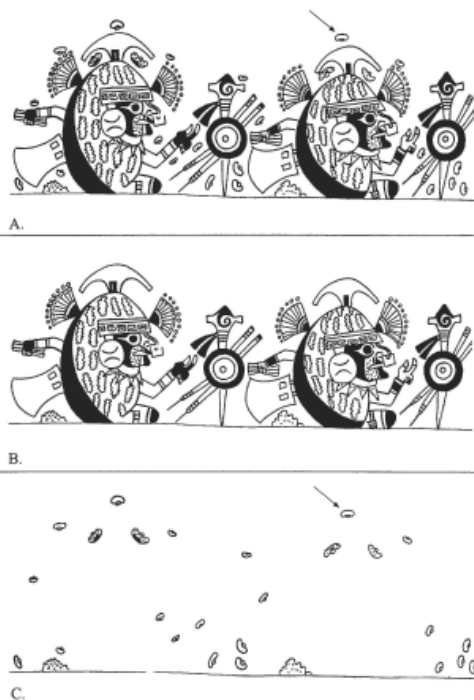


Figure 7. Examples of: a) primary and secondary images; b) primary image; and c) secondary images (after Kutscher 1983).

1984; Infantes 1964; Klein 1967; Kutscher 1983; Larco 1938, 1939, 2001; Nieves 1996; Margaret Jackson, personal communication 1999; Anna Nieves, personal communication 1997) with examination of painted and sculpted stirrup spout bottles from the Museo Arqueológico Rafael Larco Herrera in Lima and other collections (i.e., the Museo de Arqueología in Trujillo, the Museo Nacional in Lima, and Virginia Commonwealth University). Particular attention was focused on identifying duplicate images and motifs in order to prevent an artificial inflation of the sample size. Chronological classification using Larco's Phase I-V designations was possible on 52 vessels (table 1). The findings indicate two major patterns. First, an overwhelming majority (77%) of the vessels with primary anthropomorphized lima bean warriors are assigned to Moche Phase IV (figure 8). Their sudden appearance in the repertoire of fineline themes is consistent with an overall emphasis during Phase IV

Ceramic Phase	II	II/III	III	III/IV	IV	IV/V	V
Anthropomorphs				1	20	1	4
Naturals	1	1	7	2	14	1	

Table 1. Counts of anthropomorph and natural bean images during Moche Phases II-V (n=52).

on activities related to captives, combat, and blood (Donnan and McClelland 1999; Jackson 2000:48-54). Second, the presence of vessels with natural lima bean images steadily increases over time, with the highest percentage during Phase IV (figure 8).

Significant change between Moche Phases III, IV, and V in the thematic content of Moche imagery has been reported by various scholars (Bawden 1996; Benson 1972; Donnan and McClelland 1999). Change in content and iconographic representation is reported to vary from theme modification to iconographic replacement, and reflects dynamics of social change, shifts in political institutions, and renegotiation of power (Bawden 1996:166, 277). It would seem that the pattern represented by the natural form of the lima bean and the bean warrior motif join other groups of images that responded to social, political, and ideological change. The lack of lima beans in the archaeological record parallels the changing iconographic representations of lima beans over time. The pattern represents a transformation (Levi-Strauss 1997) in the socially constructed preference and classification of lima beans during the Moche Period. Once considered edible and part of the subsistence base, the lima bean became restricted to use as a status symbol or in ceremonies (e.g., Douglas 1966; Harris 1997; Whitley 1994).

Dietary laws are not arbitrary (Soler 1997). The analysis of food and eating systems are instructive and provide a basis for understanding how people comprehend and categorize objects in their world (Douglas 1966). Society expresses itself through food and eating systems (Levi-Strauss 1997), making choices between all foods that are available. At the same time, by defining relationships between what is eaten and what is not, dietary habits are linked to one's perception of the world (Douglas 1966). Dietary habits must be differentiated from one another if they are to successfully play a role in

defining variation in a society, be it through taboos, feasting practices, or contrasted food categories (e.g., Douglas 1966; Meigs 1997; Soler 1997). The political and ideological value assigned to lima beans may have been tied to a developing ideology that became visible archaeologically during the Middle Moche Period (Phases III and IV), linking lima beans to Moche ideology by way of the warrior class. Thus, Moche elites politically manipulated the lima bean and effectively removed it from regular dietary consumption, while concurrently elevating it through ideological association with the Moche warrior class. It is reasonable to extend the attributes of prestige and privilege associated with the Moche warrior class to both the lima bean and its iconographic counterpart, the «bean warrior», which thereafter came to symbolize metaphors of life, death, and rejuvenation.

Modern Agricultural Studies and Medical Information: Possible Links to Moche Ideology

The final topic that has bearing on this study involves reports on non-nutritional factors that implicate lima beans as a source of toxin. In the early twentieth century, the discovery of prussic acid or hydrocyanic acid (HCN) in wild forms of lima beans was traced to phaseolunatin (C₁₀H₁₇NO₆). This compound is responsible for the characteristic taste of lima beans. It is present in all parts of the lima bean plant, however the seed contains the greatest amount (Allen and Allen 1981). HCN is released under damp conditions, including ingestion and chewing. Prolonged boiling, however, is reported to neutralize HCN levels for safe human consumption (Allen and Allen 1981).

Cyanide is a potent and rapidly acting asphyxia that inhibits cellular utilization of oxygen. Cyanide poisoning of dietary origin has serious implications

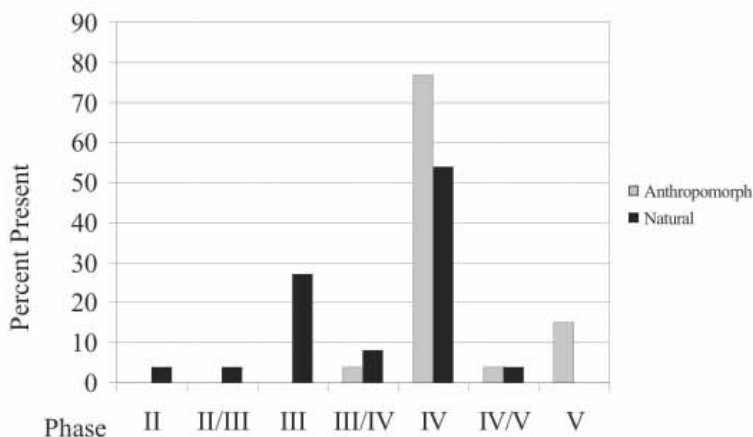


Figure 8. The distribution of anthropomorph and natural bean images during Moche Phases II-V (n=52).

for livestock and other animals (Aletor 1989:457-461; Allen and Allen 1981; Egekeze and Oehme 1980; Kingbury 1964; Moller and Hemmingsen 2003; Ologhobo *et al.* 1993; Ologhobo *et al.* 2003). HCN has been implicated in animal deaths – in particular livestock fed high quantities of lima bean fodder. Modern studies also report histological alterations in the internal organs of growing chicks (e.g., inability of the lungs to inflate, increased pancreas weight, and hemorrhaging of the intestinal wall) placed on a diet of lima beans.

For humans, modern occurrences of poisoning are less common, apparently due to greater dietary variety as well as standardized preparation. Modern occurrences of poisoning from dietary sources are documented, however (e.g., Allavena 1984; Krieg and Saxena 1987:582-584; Suchard *et al.* 1998:742-744). Reported reaction to HCN indicates that symptoms can often be non-specific. The symptoms range from weak reactions, such as difficult and labored breathing, to strong reactions, such as lung collapse and comatose. Reports also list severe compromise of the cardiovascular system and death. In most cases, however, patients are shown to respond promptly with proper diagnosis and immediate treatment.

The history of human/plant interaction in coastal Peru almost certainly included a body of knowledge about plant properties that passed from generation

to generation that most likely included plant husbandry practices, social and cultural classifications, nutritional and non-nutritional properties, and taboos and restrictions. For example, the San Pedro cactus (*Trichocereus pachanoi*) exemplifies practices involving the ritual realm and the cultural classification of plants (Sharon and Donnan 1977). San Pedro cactus remains are not particularly evident in the archaeological record. The cactus has been identified, however, in Chavín-style art dating to approximately 1300 B.C. It persisted in North Coast art into Chimú times more than a thousand years later (Sharon and Donnan 1977:133). Today, the continued use of the hallucinogenic San Pedro cactus by North Coast folk healers suggests the continuity of Andean magic-religious tradition where cultural classifications and folk knowledge remain integral to ritual practices. The charter that initiates folk healers is often tied to creation myths or mythology (Sharon 1976). We must take into account, therefore, the possibility that Moche ideology and mythology consciously incorporated the non-nutritional properties of lima beans into rituals (Douglas 1966; Harris 1997), as well as the potential that beans were associated with rituals and ideological complexes involving Moche warriors (e.g., Hocquenghem 1987; Nieves 1996). The social sanctions surrounding the ideological complexes of the warrior may have therefore effectively removed them from the daily, domestic diet.

Discussion

This study draws upon ceramic vessels as a chronological basis to understand how specific Moche iconography correlates with the pattern of lima bean distribution through time. I argue change seen in both the iconography and the archaeological record during the Moche Period, evident in patterns involving lima bean motif modification in painted and sculpted ceramic iconography and the absence of lima beans in the archaeological record, reflects sociopolitical change in Moche society. Ideologically driven iconography will develop after political authority becomes institutionalized (DeMarrais *et al.* 1996), influencing the rules and regulations that affect the subsistence base. The transformation of lima beans from common food to restricted food in direct association with socially defined categories ultimately linked them to the prestige associated with the warrior class. This «re-classification» essentially removed them from the regular dietary regime. This pattern is particularly evident when bean data from the Cupisnique, Moche, and Chimú domestic levels at the Complejo El Brujo are compared through time.

Moche iconography abounds with themes tied to a complex ritual cycle, many relating to metaphors of life and death (Bawden 1996; Bourget 2001; Jackson 2000) that include images of beans (Hocquenghem 1987; Nieves 1996). Fertility and regeneration of life are created out of death. Regeneration of life denies extinction, whether on an individual level or, more broadly, on a societal level (Bloch and Parry 1982). Through the processes of regeneration, leadership is reasserted, reconfirmed, and legitimized. Death becomes the ultimate source of regeneration, a device for the creation of ideology and political domination (Bloch and Parry 1982). In the Moche case, power within the ritual sphere was extended to those involved in ritual practices of sacrifice and warfare – the symbolic function of the imagery was imposed onto the warrior class. As a conceptual analogy, this may explain why lima beans are not found in domestic contexts dating to the Middle and Late Moche Periods, and are essentially absent

in contexts dating to the Early Moche Period. Sanctioned from daily, domestic use, they became an index associated with cycles of life, death, and the regeneration of life through the ideological complexes of the warrior class.

Moche iconography of natural bean motifs and anthropomorphized bean warriors can be categorized in discrete time periods that form distinctive patterns through time. Primary images of natural beans steadily increased over time, beginning in the Early Moche Period (Phase II) and cresting in the Middle Moche Period (Phases III and IV). They then virtually disappeared in the Late Moche Period (Phase V). At the same time, primary images of anthropomorphized bean warriors first appeared during the Middle Moche Period (Phases III and IV) and dramatically decreased during the Late Moche Period (Phase V). Botanical remains of lima beans also have a distinct pattern. Their near absence in the archaeological record of sites occupied at different times throughout the Moche Period suggests that they became the target of social and/or political sanctions. In other words, their availability, use, and consumption in domestic contexts became rare or restricted. The modern discovery of HCN in lima beans and the probability that the phytochemical properties were known during antiquity in Moche folk medicine and used by practitioners helps frame the reclassification and sanctions placed on lima beans into the ritual and ideological realm.

It is argued elsewhere that the ideological complexes involving Moche warriors included blood, death, and rebirth (Alva and Donnan 1993; Benson 1972; Bourget 2001; Galvez and Briceño 2001; Jackson 2000). Bean warrior motifs are hypothesized to be a metaphor for life itself, associated with the warrior class that, in Moche society, was an integral component of social reproduction through ritual practices involving blood and death and cycles of rejuvenation. The distribution pattern of lima beans in art and archaeological contexts during the Moche Period parallels that of subsistence resources in other parts of the Andes. For example, Miller and Burger

(1995) examine the use of fauna and flora in Chavín iconography, concluding that the vast majority of plants and animals depicted on sculptures at Chavín de Huántar were not important from a dietary perspective. Animal images include the jaguar (*Panthers onca*), black cayman (*Melanosuchus niger*), harpy eagle (*Harpia harpyja*), and anaconda (*Eunectes murinus*). Although common in Chavín art, the remains of these animals are absent from Chavín middens. The animals that comprised the subsistence base for the peoples of Chavín de Huántar were never portrayed on their temples, and were entirely absent from other iconographic media. The San Pedro cactus is a plant that fits the same pattern of being common in Chavín art but of no apparent dietary importance (e.g., Sharon and Donnan 1977).

Without the aid of iconography and the bean warrior motif, we might view the paucity of lima beans in Moche botanical samples very differently. The institutionalization of Moche political authority and accompanying ideological forces were influential and permeated all socioeconomic groups. Moche elites may have chosen lima beans as a metaphor that indexed a life cycle ritually enacted by warriors. By doing so, sanctions against daily use essentially removed them from the domestic subsistence base. Lima beans are lacking from archaeological samples in domestic contexts, yet are portrayed in fineline and fancy ceramics. Future investigation will provide additional details concerning the general onset of socially sanctioned plant use, the dietary restrictions that surround various socioeconomic groups, and the demographic distribution of practices involving lima beans in particular.

Acknowledgements: I wish to express gratitude to all those who have made this research possible including: Arizona State University and GSPA-ASU; Dumbarton Oaks; Galindo Archaeological Project; Instituto Nacional de Cultura; Moche Foodways Archaeological Project; Moche Valley Archaeological Project; Museo Larco, Lima; Pontificia Universidad Católica del Perú; Proyecto Arqueológico El Brujo and Fundación Augusto N. Wiese.

Notes

¹ Moche Valley Archaeological Project (1997): Brian Billman, Jesús Briceño, and George Gumeran, Co-Principle Investigators.

² Galindo Archaeological Project (2000, 2001): Gregory Lockard, Director (2000, 2001); Luis Jaime Castillo, Asesor (2000); Francisco Luis Valle, Codirector (2001).

³ Moche Foodways Archaeological Project (1997-2002): George Gumeran, Principle Investigator in collaboration with Régulo Franco, César Gálvez, and Segundo Vásquez.

⁴ Editors Note: By the time the analysis of the GAP soil samples was complete, a single lima bean had been recovered from a 2001 sample taken from a hearth in a high status Late Moche residence (see Lockard 2005, table 7.11, table 7.13, and Appendix 11).

References Cited

- Aletor, V.
1989 «Dietary interactions of lima bean (*Phaseolus lunatus*) Trypsin Inhibitor, Haemagglutinin and Cyanide. Parte 2. Effect of pancreatic and intestinal alpha-amylase EC3.21.1.1 in growing albino rats». En *Nahrung*, 33(5):457-461.
- Allen, O. N., y Ethel Allen
1981 *The Leguminosae, a Source Book of Characteristics, Uses, and Nodulation*. Madison: University of Wisconsin.
- Allavena, A.
1984 «Beans (*Phaseolus*)». En W. Sharp, D. Evans, y P. Ammirato (eds.). *Handbook of Plant Cell Culture, Crop Species*. Nueva York: MacMillian Publishers, pp. 137-169.
- Alva, Walter y Christopher Donnan
1993 *Royal Tombs of Sipan*. Los Angeles: Fowler Museum of Natural History, University of California.
- Arsenault, Daniel
1987 «Le phénomène de la mort et les activités de l'âme dans l'après-vie chez les Moche (ou Mochica), une culture de la côte nord du Pérou». Tesis de maestría. Université de Montréal.
- Bawden, Garth
1996 *The Moche*. Cambridge: Blackwell Publishers.
- Benson, Elizabeth
1972 *The Mochica Culture of Northern Peru*. Nueva York: Praeger Publishers.
- Bird, Junius y John Hyslop
1985 «Ceramic excavations at Huaca Prieta, Chicama Valley, Peru». En *Anthropological Papers of the American Museum of Natural History*, 62:1, Nueva York.
- Bloch, Maurice y Jonathan Parry
1982 «Introduction». En M. Bloch y J. Parry (eds.). *Death and the regeneration of life*. Cambridge: Cambridge University Press, pp. 1-44.

- Bourget, Steve
1989 «Structures magico-religieuses et idéologiques de l'iconographie Mochica IV». Tesis de maestría. Université de Montréal.
- 2001 «Rituals of sacrifice: Its practice at Huaca de la Luna and its representation in Moche iconography». En J. Pillsbury (ed.). *Moche Art and Archaeology in Ancient Peru*. Studies in the History of Art 63. Center for Advanced Study in the Visual Arts, Symposium Papers XL. Washington, D.C.: National Gallery of Art, pp. 88-109.
- Bynum, Caroline
1997 «Fast, Feast, and Flesh: The religious significance of food to medieval women». En C. Counihan y P. Van Esterik (eds.). *Food and culture*. Londres: Routledge, pp. 138-158.
- Calkin, Carlton
1953 «Moche Figure Painted Pottery: The History of an Ancient Peruvian Art Style». Tesis de doctorado, University of California.
- DeMarrais, Elizabeth, Luis Jaime Castillo, y Timothy Earle
1996 «Ideology, materialization, and power strategies». En *Current Anthropology*, 37(1):15-31.
- Dobkin de Ríos, Marlene
1977 «Plant hallucinogens and the religion of the Mochica – An ancient Peruvian people». En *Economic Botany*, 31:189-203.
- Donnan, Christopher
1976 *Moche Art and Iconography*. Los Ángeles: Latin American Center, University of California.
1978 *Moche Art of Peru*. Los Ángeles: Museum of Culture History, University of California.
- Donnan, Christopher y Donna McClelland
1999 *Moche Finesline Painting: Its Evolution and its Artists*. Los Ángeles: UCLA Fowler Museum of Cultural History.
- Douglas, Mary
1966 *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. Londres: Routledge.
- Egekeze, J. y F. Oehme
1980 «Cyanides and their toxicity: A literature review». En *Tijdschr Diergeneeskde*, April 15:105 (8): suplemento 2:104-114.
- Friedberg, Claudine y Anne Marie Hocquenghem
1977 «Des haricots hallucinogènes?». En *Journal d'agriculture traditionnelle et de botanique appliquée*, 24(1):51-53
- Galvez, César y Jesús Briceño
2001 «The Moche in the Chicama Valley». En J. Pillsbury (ed.). *Moche Art and Archaeology in Ancient Peru*. Studies in the History of Art 63. Center for Advanced Study in the Visual Arts, Symposium Papers XL. Washington, D.C.: National Gallery of Art, pp. 141-157.
- Gumerman IV, George
1991 «Subsistence and complex societies: Diet between diverse socio-economic groups at Pacatnamu, Peru». Tesis de doctorado. University of California.
1997 «Food and complex societies. *Journal of Archaeological Method and Theory*, 4(2):105-139.
- Gumerman IV, George y Jesús Briceño
2003 «Santa Rosa-Quirihuac y Ciudad de Dios: Asentamientos rurales en la parte media de valle de Moche». En S. Uceda y E. Mujica (eds.). *Moche: Hacia el Final del Milenio*. Lima: Universidad Nacional de Trujillo y Fondo Editorial de la Pontificia Universidad Católica del Perú, pp. 217-243.
- Gumerman IV, George, Kendall Campbell, y Gail Ryser s/f
«Moche politics and food: Household self sufficiency and decentralization.
- Harris, Marvin
1997 «The abominable pig». En C. Counihan y P. Van Esterik (eds.). *Food and Culture*. Londres: Routledge, pp. 67-79.
- Hayden, Brian
1990 «Nimrods, piscators, plunkers and planters: The emergence of food production». En *Journal of Anthropological Archaeology*, 9:31-69.
- Hastorf, Christine
1993 *Agriculture and the Onset of Political Inequality before the Inca*. Cambridge: Cambridge University Press.
1999 «Cultural implications of crop introductions in Andean prehistory». En C. Gosden y J. Hather (eds.). *The Prehistory of Food: Appetites for Change*. Londres: Routledge, pp. 35-58.
- Hocquenghem, Anne Marie
1984 «El hombre y el pallar en la iconografía Moche». En *Antropológica*, II(2), pp. 403-411, Lima.
1987 *Iconografía Mochica*. Lima: Fondo Editorial de la Pontificia Universidad Católica del Perú.
- Hough, Ian
2000 «Diet, economic specialization and complex societies on the north coast of Peru». Tesis de magister. Northern Arizona University, Flagstaff.
- Infantes Vera, J. G.
1964 «Vegetales que los antiguos peruanos usaron para comidas y bebidas y que se usan actualmente. XXXV Congreso Internacional de Americanistas, 1962 III: 153-168.
- Jackson, Margaret
2000 «Notation and Narration in Moche Iconography, Cerro Mayal, Peru». Tesis de doctorado. University of California.
- Kaplan, Lawrence
1980 «Variation in the cultivated beans». En T. Lynch (ed.). *Guitarrero Cave, Early man in the Andes*. Nueva York: Academic Press, pp. 145-148.
1981 «What is the origin of the common bean?». En *Economic Botany*, 35(2):240-254.

- Kingsbury, J. M.
1964 *Poisonous plants of the United States and Canada*. Prentice-Hall, Englewood Cliffs.
- Klein, Otto
1967 *La Cerámica Mochica, Caracteres Estilísticos y Conceptos*. Valparaíso: Universidad Técnica Federico Santa María.
- Krieg, A. y K. Saxena
1987 «Cyanide poisoning from metal cleaning solutions». En *Annals of Emergency Medicine*, May 16 (5): 582-584.
- Kutscher, Gerdt
1983 *Nordperuanische Gefäßmalerei des Moche*. Munich: Verlag C. H. Beck.
- Larco Hoyle, Rafael
1938 *Los Mochicas*, tomo 1. Lima: Casa Editora La Crónica y Variedades.
1939 *Los Mochicas*, tomo 2. Lima: Casa Editora La Crónica y Variedades.
- 1942 «La Escritura Mochica Sobre Pallares». En *Revista Geographica Americana*, (107):93-103.
1943 «La Escritura Mochica Sobre Pallares». En *Revista Geographica Americana*, (112):277-292, 345-354.
1948 *Cronología arqueológica del Norte del Perú*. Buenos Aires: Sociedad Geográfica Americana.
2001 *Los Mochicas*, tomo 1. Lima: Museo Arqueológico Rafael Larco Herrera.
- Lévi-Strauss, Claude
1997 «The culinary triangle». En C. Counihan y P. Van Esterik (eds.). *Food and culture*. Londres: Routledge, pp. 28-35.
- Lockard, Gregory
2005 *Political Power and Economy at the Archaeological Site of Galindo, Moche Valley, Peru*. Tesis de doctorado, University of New Mexico y University Microfilms International.
- McClelland, Donna
1977 «The ulluchu: A Moche symbolic fruit. En A. Cordy-Collins (ed.). *Pre-Columbian Art History*. San Diego: Peek, pp. 435-452.
- Meigs, Anna
1997 «Food as a cultural construction». En C. Counihan y P. Van Esterik (eds.). *Food and Culture*. Londres: Routledge, pp. 95-106.
- Miller, George y Richard Burger
1995 «Our father the cayman, our dinner the llama: Animal utilization at Chavín de Huantar, Peru». En *American Antiquity*, 60(3):421-458.
- Moller, S y C. Hemmingsen
2003 «Cyanide poisoning». En *Ugeskr Laeger*, June 16:165 (25):2579-2580.
- Nieves, Anna
1996 «The Mochica Bean-warrior: An Iconographic Context for Mochica Ceramics». Tesis de magister. Virginia Commonwealth University.
- Ologhobo, A., D. Apata, A. Oyejide, y O. Akinpelu
1993 «Toxicity of raw lima beans (*Phaseolus lunatus* L.) and lima bean fractions for growing chicks». En *Br Poult Sci.*, 34(3):505-522.
- Ologhobo, A., R. Mosenthin y O. Alaka
2003 «Histological alterations in the internal organs of growing chicks from feeding raw jack bean or lima bean seeds». En *Vet Mun Toxicology*, 45(2):114.
- Pearsall, D.
1989 *Paleoethnobotany*. San Diego: Academic Press.
- Pozorski, Sheila
1976 *Prehistoric Subsistence Patterns and Site Economics in the Moche Valley, Peru*. Tesis de doctorado. University of Texas y University Microfilms International.
- Ryser, Gail
1998 «Beans: Prehistoric indicators of social relations and organization in the Moche Valley, Peru». Tesis de magister. Northern Arizona University.
2002 «Paleoethnobotany: Evidence from the Moche occupation at Dos Cabezas, Jequetepeque, Peru». Paper presented at the 14th European Meeting of the Paleopathology Association Coimbra, Portugal.
- Sharon, Douglas
1976 «Distributon of the Mesa in Latin America». En *Journal of Latin American Lore*, 2(1):71-95.
- Sharon, Douglas y Christopher Donnan
1977 «The magic cactus; ethnoarchaeological continuity in Peru». En *Archaeology*, 30(6):374-381.
- Smith, Earle Jr.
1980 «Plant remains from Guirarrero Cave». En T. Lynch (ed.). *Guirarrero Cave, Early Man in the Andes*. Nueva York: Academic Press, pp. 87-119.
- Soler, Jean
1997 «The semiotics of food in the Bible. En C. Counihan y P. Van Esterik (eds.). *Food and Culture*. Londres: Routledge, pp. 55-66.
- Suchard, J., K. Wallace y R. Gerkin
1998 «Acute cyanide toxicity caused by apricot kernel ingestion». En *Annals of Emergency Medicine*, 32(6): 272-274.
- Vivante, Amando
1941 «La Escritura de Los Mochicas Sobre Porotos». En *Revista Geográfica América*, 92:297-310.
1942 «El juego Mochica con pallares». En *Revista Geográfica América*, 110:275-280.
- Whitely, David
1994 «By the hunter, for the gatherer: Art, social relations and subsistence change in the prehistoric Great Basin». En *World Archaeology*, 25(3):357-373.
- Yacovleff, Eugenio y Fortunato Herrera
1934 *El Mundo Vegetal de los Antiguos Peruanos*. Lima: Imprenta del Museo Nacional.