

**BAJA CALIFORNIA SHELL MIDDEN CAMPS:
SIMILARITIES AND DIFFERENCES, RESEARCH IN PROCESS
IN THE NORTHERN COAST OF THE PENINSULA**

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This paper presents the results of the 2011-2012 field season of the project “Study of Camps along the Coast and in the Intermountain Valleys of Baja California,” whose general scope consists of the characterization of the camps located in the northern part of the Baja California peninsula for their study and conservation. This phase of our research focused on the excavation of three shell midden camps, and it has allowed us to establish comparisons between the archaeological signatures in this type of seasonal settlement of the hunter-gatherer-fishers who occupied the study area during the Archaic and Late Prehistoric periods.

The coastal camps found on the northern coast of the Baja California, Mexico are the objects of this study, in particular the archaeological sites located in an area known as Jatay, 63 km south of the border with the United States. This paper presents the results of a systematic surface survey and the excavations at three of the 16 selected sites, as parts of the “*Estudio de campamentos en la línea costera y valles intermontanos de Baja California*” project.

STUDY AREA

The limits of Jatay as an area of influence extend beyond the arbitrary methodological borders that delimit our study area, which circumscribe the Bajamar Tourist Complex. North and west, we find the natural frontiers of Cañada del Diablo and the Pacific Ocean; the transpeninsular highway is the eastern border; and privately owned parcels delimit the south of the study area.

Jatay is a particularly interesting zone for the study of the coastal camps of Baja California, given the number of camps, their concentration, and their state of preservation, as well as their chronology and the characteristics of the archaeological sites found there. We are dealing with a mosaic formed by a wide variety of types of shell middens that show the presence of different groups of hunter-gatherer-fishers who inhabited the peninsula through time.

The opportunity to continue studying an archaeological area intensely examined for a little more than 20 years represents a great advantage, since it enables us to have a representative sample of case studies. However, it also poses a series of challenges involved in designing a methodological strategy that allows us to order the information for its subsequent comparison with the data reported by previous and present researchers. In this way, we believe that in order to understand the 91 recorded and three excavated sites, they must be put into context with the rest of the settlements that surround them. The analysis in progress of the materials and the upcoming field seasons will contribute to understanding Jatay as an important zone in terms of subsistence, but we must also propose, in the future, other factors that may have influenced the selection of this area by many groups in the past.

MATERIALS RECOVERED

During the excavation of Cluster U4, we recovered 6,318 lithic artifacts, 6,195 of them related to the flaked lithic industry and 123 related to the ground stone industry, as well as 21 Tizon Brown potsherds and 926 animal bones. Also collected from each stratum were shells that could be measured and

taxonomically identified, along with soil samples to be sifted through finer mesh to obtain additional malacological samples. For pollen and chemical analyses, soil samples were taken. To measure the remnant magnetism of rocks that were subjected to fire, rocks that formed some of the hearths and excavated heated-stone cooking features were selected. With regard to samples for dating, it was not possible to obtain charcoal fragments larger than 5.0 g, so that even though we did have charcoal samples, it was decided to use shells of the species *Haliotis cracherodii* (eight samples) and potsherds (two samples) for dating.

SETTLEMENT PATTERN

As a result of the survey conducted during 2011, we updated the records of 13 previously identified archaeological sites, and we recorded 91 additional sites (Fonseca and Torres 2012). With information from the field reports for excavated sites in the area, maps were prepared to identify their distribution and the issues that may have influenced the settlement pattern.

At a regional level, Jatay is a strategic area for the ecological resources that were available: access to easy collection of rocky-habitat mollusk species such as the black abalone (*Haliotis cracherodii*) and other species that form the trophic chain of which they are part: sea urchin (*Strongylocentrotus purpuratus*), sheephead (*Semicossyphus pulcher*), and sea otter (*Enhydra lutris*), to mention a few (Guía 2008, 2009). There is also evidence for hunting of small, medium, and large mammals, the presence of fresh water sources, and raw materials to make lithic tools. Finally, Cañada del Diablo, which becomes Jatay Canyon, must have been a useful route to move from the valleys to the coast and vice versa.

The preference for Jatay that hunter-gatherer-fishers felt is evident in the high concentration of identified sites. Below, we will analyze the distribution of camps within the study area, as well as some factors that may explain it.

As can be appreciated in Figure 1, the archaeological sites within the study area are concentrated in two groups: one northwest of the Bajamar Tourist Complex, and the other in its southwestern extreme.¹ Those sites found in the northwestern area are located 100-200 m from Cañada del Diablo, and their proximity to fresh water sources would justify their location. Initially, the explanation for those that are located in the southwestern zone was less evident. In the field, the coordinates of the drainages (now dry) that we passed were marked, but a critical factor counting against us was the alteration of the area during the construction of the tourist complex. The different recorded drainages were checked against the Bajamar Master Lot Division Plan, and it was then that we observed that although at present the drainage network is less evident, the slope that descends to the sea—which was channeled by the Complex's engineers—can account for the concentration of sites found in the southwestern zone.

Now with the variable of “proximity to fresh water sources” combined with other variables, we would have sites along the entire bank of the arroyo mentioned above or that of Cañada del Diablo; however, this is not the case. The second variable affecting the settlement pattern that we considered was the “proximity to the coast.” On the contrary, as you go farther from the present coastline, the number of sites increases. The highest proportion of sites is distributed along terraces, between 60 and 90 m above sea level, where 36 percent of the camps are found.

The proximity of the marine resource does not seem to determine the presence of camps, as may have been done by their proximity to the fresh water sources and areas for hunting, the need of protection against strong coastal winds, and the use/function of the camps. So far, we can establish three uses or functions for the analyzed coastal camps, which are not mutually exclusive: a) the preparation and consumption of food, b) the manufacture of lithic tools and/or ornamental objects, and c) burial areas.

The burials identified in the region are not farther than 500 m from the current coastline (Baeza 2005; Drakíc et al. 2005, 2007; Oviedo and Guía 2008; Reina 1994; Torres 2008),² except for the case of one burial from the final phase of late prehistory (500 ±40 B.P.) that is located 1.5 km from the coast (Ovilla and García 2008).³ In these cases, the use/function of a camp as a burial place determines its location, but not its proximity to the sea. If that were so, there would not be camps for the preparation and

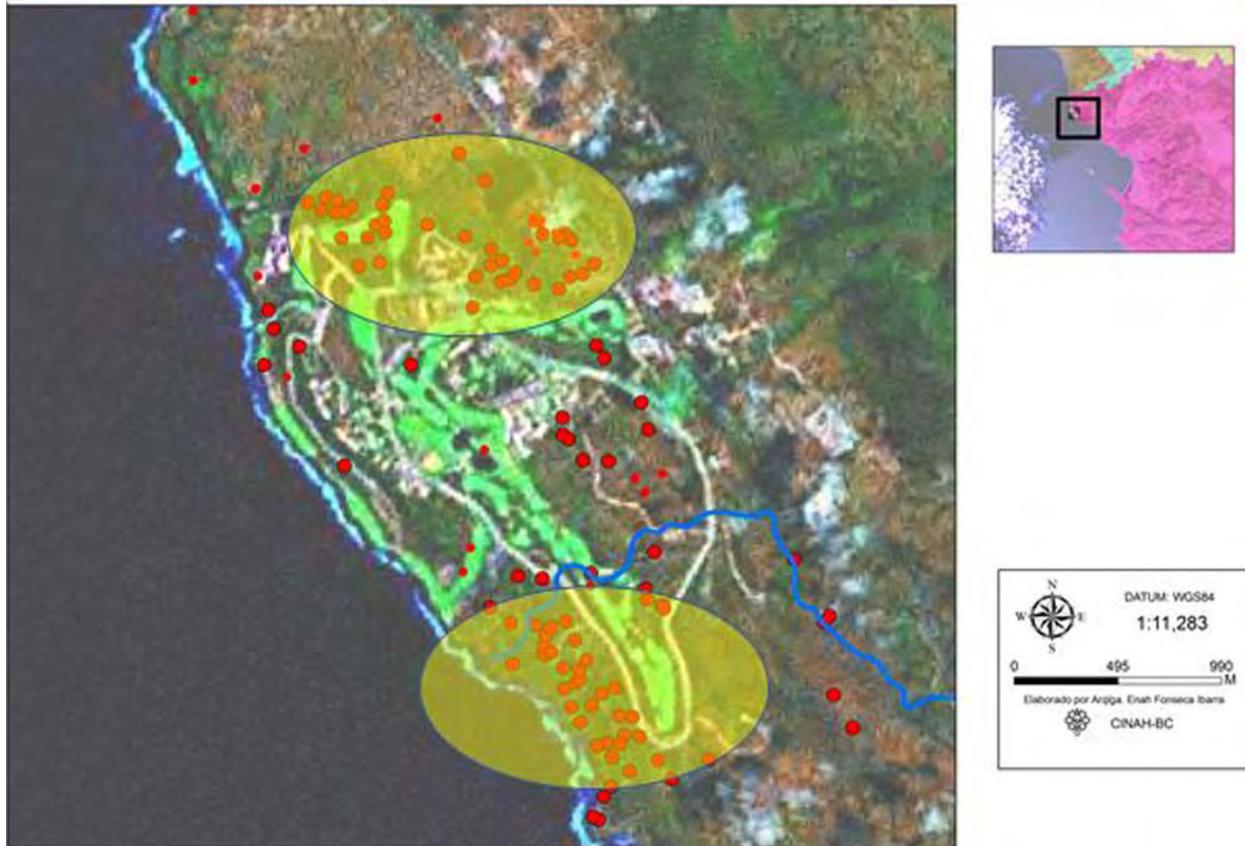


Figure 1. Clusters of archaeological sites in the study area.

consumption of food near the sea. For now, we can only consider that the sites with a funerary use/function, as well as being exceptional cases because of the presence of burials, stand apart from the concentrations of camps located around fresh water sources. Therefore, the selection of these spaces was in response to different variables that so far we cannot decipher. What we can point out is that even if there are food preparation and consumption camps near the sea, the majority of them are found inland around fresh water sources, and this is owing to the activities carried out within them.

On terraces where this latter kind of site is located, two different phenomena might occur: the reuse of the same camp, or the reuse of elements from a camp, but at a nearby location. After all, given that the predominant activity was the preparation of food, it would be possible to obtain the necessary supplies for making a hearth or campfire and to obtain “abandoned” nodules of raw material to make tools or manos and pestles in order to grind foods. This would be another factor that could affect the proximity between middens.

CLOSE-UPS AND DISTANT SHOTS

In this exercise of analyzing camps at different scales, we will now “zoom in” on Cluster U4 in order to observe activity areas present in the three middens addressed in 2012. During the excavation of Cluster U4, formed by camps U4e, U4b, and U4c, the representative elements or the association of those elements were assigned consecutive numbers, and x, y, z coordinates were taken for each one.⁴ This was done for the purpose of having a three-dimensional record for subsequent mapping and the identification of relationships between the objects that would make it possible to identify activity areas within the camps.⁵

The middens that form Cluster U4 were all formed in a similar way. According to the associations of identified archaeological elements, the inferred activity areas are those for (a) food preparation, (b) food consumption, and (c) manufacturing of lithic tools or artifacts.⁶

Food Preparation

This refers to the presence of different kinds of hearths in association with ceramics, manos and pestles, mollusk shells, and unmodified animal bones, with or without evidence of having been subjected to fire. It is probable that a relationship exists between hearths and certain lithic tools or flakes modified in food processing, but so far we have not identified any lithics exclusive to these spaces.

Hearths and Heated-Rock Cooking Features

One of the key archaeological elements in the coastal camps for preparation and food consumption is hearths. Along the peninsula, there are different areas or rock features whose main characteristic is the traces left by fire. Their morphology is varied and relates to the use for which they were destined. Following Milburn et al. (2009), it is necessary to distinguish hearths and campfires (features in which food is cooked by direct contact with fire, on embers, or in ceramic or stone containers) from heated-rock cooking features (rock features in which food is cooked by direct contact with heated rocks). According to their classification, in the study camps we can identify four hearths, two grills, one stone-lined firing pit oven, and six cases of a variant that does not fit any of the defined types.

The variant to which we refer consists of a group of rocks that define a circumference, within which rocks or slabs are also placed. Morphologically, it differs from a grill because it is more compact and there is a clear delimitation of its circumference, and it is differentiated from more common hearths by the rocks that are placed within it. The interior rocks may have served for cooking foods, but those were probably not placed directly on them, but rather in ceramic containers (Figures 2 and 3). At Camp U4c, this type of “hearth” was found in association with a broken ceramic vessel. Similarly, Drakíc and Delgado (2010:11) report finding a bowl in situ on a “small hearth specifically created to hold the container.” The diameter and compactness of these hearths may be subject to the diameter of the containers that would be placed on top of them and that would be heated by the effect of hot rocks and not by direct fire, since the sherds do not present evidence of having been burnt.⁷

We may point out that the differences between the varieties of hearths and rock features are not chronological; hearths, grills, and the stone-lined firing pit oven identified in Layer III, 20-30 cm seem to be contemporaneous. On the other hand, the variant mentioned is the only “hearth” that might be later, due to its association with ceramic fragments and because it was found in a later occupation period in two of the three excavated camps—U4c and U4e, Layer I, 1-10 cm.

The morphological differences between hearths, grills, and stone-lined firing pit ovens rely on their use/function, so it is probable that this also applies to the identified “hearth” variant; that is, it must have been used for the preparation of different foods, for their consumption or preservation (salted, smoked, or dried). The study of the remnant magnetism in rocks that formed hearths and rock features, added to the relationship between these and the malacological and osteological materials, as well as the analysis of traces of patterns related with their processing (butchering, roasting, boiling, burning, baking), will probably allow us in the future to establish the specific use/function of these archaeological elements.

Food Consumption

This refers to the presence of mollusk shells and animal bones, with or without traces of having been subjected to fire. With the analysis of malacological and osteological materials, we hope to detect preferences in diet and differences in the processing of the foods that were consumed.

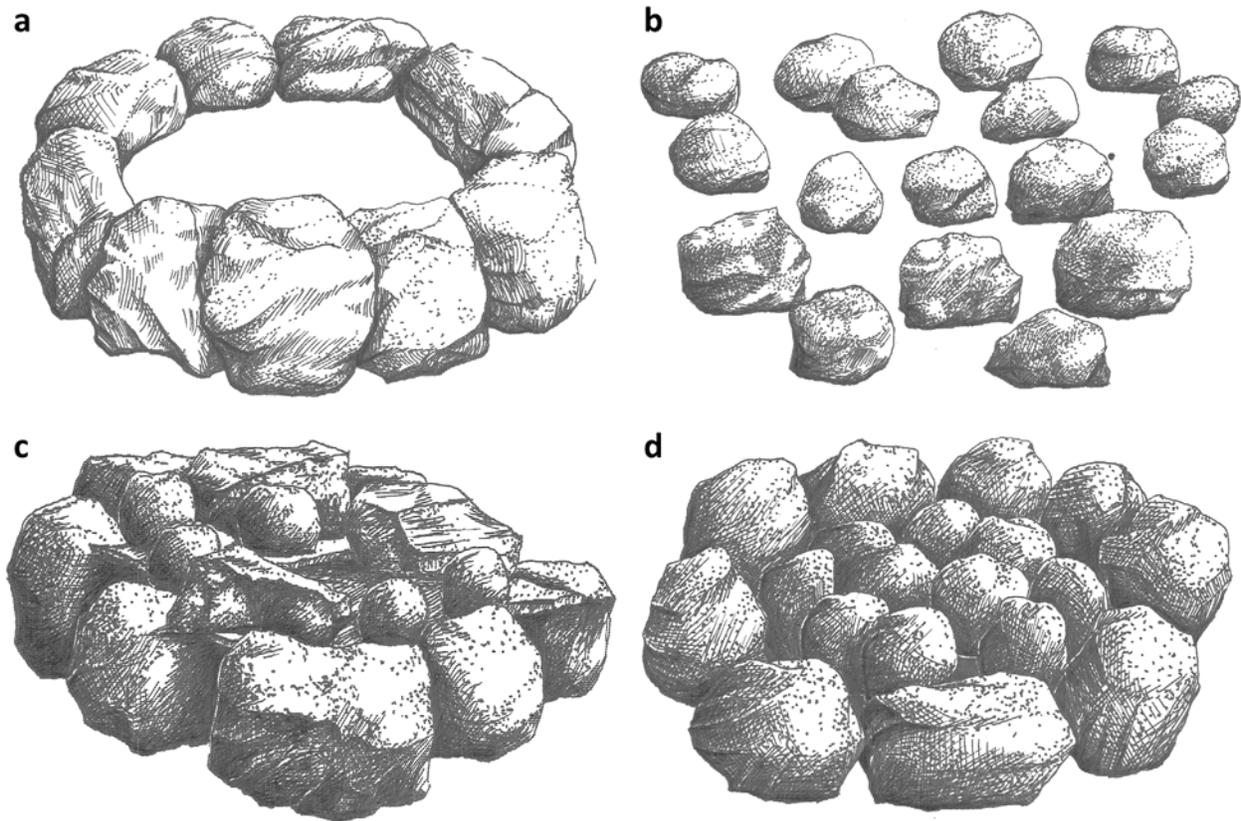


Figure 2. Hearths and heated-rock cooking structures found in Cluster U4: (a) hearth, (b) grill, (c) hearth(?), (d) stoned-lined firing pit oven.

Manufacture of Lithic Artifacts

This refers to the presence of elements of lithic reduction that make it possible to reconstruct the operational stages of lithic reduction. According to their probable use, the lithic tools were classified as knives, hammer stones, drills, projectile points and point preforms, scrapers, planes, and chopping tools, and they were manufactured from local raw materials (tuff, volcanics, rhyolite, andesite, basalt, silica, and quartz).⁸ The presence and proportion of these tools in the sites are very similar. Exceptional cases are being assessed, as well as the distribution of pieces around identified activity areas. However, areas in which there exists an exclusive type of tool or its association with a type of hearth or rock feature have not been found.

Cores, flakes, and tabular pieces modified by intentional flaking (1.9 percent) or use (2.8 percent), represent a minority compared with the 95.1 percent of pieces that were not modified (Table 1). The intentionally modified tools with bifacial retouch include a knife, a scraper, a point preform, two projectile points, and a drill with retouch on one margin (Figure 4). The type of intentional modification recorded on scrapers is on one edge (37.4 percent) but nearly twice as many pieces of this kind only show alteration by use (62.59 percent).

These percentages confirm the hypothesis of a development of an expedient type of technology: modified pieces made from lithic flakes or artifacts with scarce retouch, objects used with a cutting edge or tools to which a functional edge were added, and easy access to the raw material that was employed (Acosta 2008).⁹



Figure 3. Hearth(?) at U4e archaeological site.

Table 1. Modified, use-modified, and unmodified flakes, by site.

SITE		MODIFIED	MODIFIED BY USE	NOT MODIFIED	TOTAL
U4b	Count	34	58	793	885
	% of Total	0.6%	1.0%	13.2%	14.7%
U4c	Count	29	21	1,524	1,574
	% of Total	0.5%	0.3%	25.3%	26.2%
U4e	Count	54	96	3,405	3,555
	% of Total	0.9%	1.6%	56.6%	59.1%
Total	Count	117	175	5,722	6,014
	% of Total	1.9%	2.9%	95.1%	100.0%

At Cluster U4, we found core tools, hammer stones, primary and secondary flakes, and bifacial preforms, as well as debitage, all them belonging to one reduction sequence. However, so far we have not found areas exclusively used for tool manufacturing. Moreover, the number of unmodified flakes is very high in proportion to the number of cores that were found, which made us think that they may have been employing thermo-fracture as a technology to obtain flakes.¹⁰ The lithic analysis found that only 2.2 percent of the material showed evidence of burning, and this was not associated with any particular kind



Figure 4. Lithic artifacts from Cluster U4: Cottonwood projectile point, El Descanso projectile point, sinker, and biface.

Table 2. Presence / absence of evidence of burning on lithics, by site.

SITE		ABSENT	PRESENT	TOTAL
U4b	Count	959	16	975
	% of Total	15.2 %	0.3 %	15.4 %
U4c	Count	1,592	42	1,634
	% of Total	25.2 %	0.7 %	25.9 %
U4e	Count	3,629	80	3,709
	% of Total	57.4 %	1.3 %	58.7 %
Total	Count	6,180	138	6,318
	% of Total	97.8 %	2.2 %	100.0 %

of hearth, so that it does not seem that they used thermo-fracture, or at least not in a systematic manner (Table 2). The evidence of burning in some pieces and the existence of possible areas of tool manufacturing within camps are not evenly manifested among the middens, so there is no generalized answer.¹¹

Lastly, we want to mention some absences and the chronological factor in the study camps. The absence of ornamental objects such as shell or stone beads, for example, may be another indicator of distinct kinds of coastal camps, since these objects have been found mainly in association with human skeletal remains; however, they might also appear at stages of production within camps having areas for manufacturing ornamental goods.

Once dates for the study camps have been obtained, we will be able to emphasize the phenomena that depend on chronological factors. As a result of previous research in the area, we know that Jatay was occupied from the Archaic period (5390 ±40 B.P.) (Drakíc 2009) to the Late Prehistoric period (240 ±80 B.P.) (Ovilla and García 2008), which reconfirms the importance of the area in the past and as an object of study in the present in order to detect constants and innovations through time in the great mosaic of archaeological sites that compose this area.

BALANCE AND PERSPECTIVES

As can be seen, more than answers, we have established open lines of research for the coastal camps found in the Jatay zone, relating to settlement pattern, possible differences in the camps' uses/functions, associations between archaeological elements, and types of hearths and rock features.

The information presented will be complemented with the results of the malacological, osteological, and pollen analyses that are currently in progress. We will be able to observe differences and similarities in the use of marine and land resources at Sites U4e, U4b, and U4c, and their comparison with previously investigated camps in the area. Likewise, we plan to incorporate these results into the project's Geographical Information System, to create distribution maps with the aim of detecting associations between other materials and the hearths and rock features that have been located.

The study that is being made in order to observe the remnant magnetism of the rocks that formed one of the excavated hearths will allow us, on one hand, to determine the temperature that they may have reached when cooking food and the kind of fuel that was used, and on the other, it will allow us to calibrate with greater precision the necessary equipment—coils (EM38) and ground-penetrating radar (GPR)—in order to detect magnetic and electric anomalies that reveal areas of activity within the middens.

We hope to be able to continue working together with specialists of different disciplines, and to continue creating new bonds with national and foreign researchers that allow us to enrich our archaeological work for understanding the hunter-gatherer-fishers who inhabited the Baja California peninsula in the past.

ACKNOWLEDGMENTS

This is a presentation of the results of research in process. Thanks are due to the specialists involved. The analysis of malacological and animal bone remains is being made under the direction of Biologist Andrea Guía, CINAH-BC. Soil samples for malacological analysis are being tested by students of the Universidad Autónoma de Baja California under the direction of Dr. Carlos Figueroa and Dr. Carlos Téllez. The study of remnant magnetism of the rocks that formed one of the excavated hearths is being made by Dr. Edgardo Cañón from the Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE). The pollen analysis is being carried out by Dr. Juan Gabriel Flores, CICESE. The samples for dating were sent to the INAH Labs directed by Engineer Magdalena de los Ríos. The geophysical research at Site U4e was done by Dr. Marco Antonio Pérez Flores, CICESE.

NOTES

1. The counts of camps in the two areas are very similar: 43 in the northwest, and 45 in the southeast. However, it is likely that archaeological sites that are now buried by buildings and the golf course of the Bajamar Tourist Complex existed prior to INAH's presence in Baja California. Consequently, more than the numbers, it seems important to us to observe the trends in the settlement pattern.
2. Human burials in the northwestern zone of Baja California are found between the border with the United States and latitude 32°00' in the archaeological sites known as Buenavista, El Morro, La Punta, Bajamar Z11, Bajamar 38B3, and Costa Azul, according to the Geographic Information System of Centro INAH-Baja California (CINAH-BC).
3. The coastline has changed through time, so that the distance between it and the archaeological sites only serves to document a pattern regarding their relative closeness to the sea and the distance that is maintained by the rest of the sites located inland.
4. The three-dimensional records refer to different combinations of associations between lithics, bone, and ceramics, and their relationships with different types of hearths. In this work, we exclusively present the materials in association that were detected in the field; in the laboratory, we have identified other associations, and analyses of the materials by unit and excavated level are being made.
5. With the data from three-dimensional records, the lithic and ceramic analysis was used to create a database that was uploaded in the program Microsoft Office Excel and a Geographical Information System with the program ArcMap 9.2 from ESRI.
6. The activities that took place in the camp are presented, although other lithic pieces that reflect fishing activities (net sinkers, line, or rod) and hunting activities (projectile points) were also found.
7. Drakíc et al. (2007:109) report this hearth variety as a "new technique due to its shape," being "rounder." Ovilla and García (2008:14-15) do not make a distinction, but in pictures and plan drawings of Site 29, this variant can also be observed.
8. The methodology that we employed for the lithic analysis was that proposed by Bate (1971).
9. Despite classifying it as an expedient technology, we agree with Hardy about the risk of excessively simplifying human behavior regarding lithic material, and that there are certain criteria that should be taken into account that do not fit the established models, such as recycling pieces or saving them for later use (Hardy 2006).
10. Following Campuzano (2009), thermal fracture is a technology that seeks intentionally to create lithic fractures, in contrast to fire-cracked rocks, which are broken unintentionally by heating.
11. The quantity of material that shows signs of having been burnt is minimal compared with that which does not show such signs. However, in two middens, we observe that tool function was another variable

to be considered. In middens U4c and U4e, manos are found in similar quantities: 34 burnt pieces (52.3 percent), and 31 that were not burnt (47.6 percent).

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