

**RHYOLITE BIFACIAL PREFORM PRODUCTION AT EL PULGUERO:  
A PREHISTORIC QUARRY AND WORKSHOP SITE  
IN THE CAPE REGION OF BAJA CALIFORNIA**

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*Rhyolite is the most abundant material used for tools by the prehistoric Indians near the La Paz area in the Cape region of Baja California. Several quarry and workshop sites were located in the northeastern hills of La Paz. El Pulguero site is the largest, showing both the reduction process and the bifacial preform production evidence. In this paper, the end use of these bifacial preforms and the chronology will be discussed.*

El Pulguero site is located approximately 25 km northeast of La Paz in front of the Espíritu Santo Island, Baja California Sur (Figure 1). There is an expansive area of 1.2 km<sup>2</sup> in which prehistoric rhyolite quarries and lithic workshops are present. A part of this site was identified and worked by INAH archaeologists Jesús Mora Echeverría and Baudelina García Uranga in 1980s (García-Uranga and Mora 1981). In 1997, almost whole site was recorded by Fujita (Fujita 1998; Fujita and Poyatos 2007).

The tourist project “El Coyote Baja Resort” by the company “Maravía” includes construction of more than 2,000 residences, two golf courses, a recreation area, and a five-star hotel with 130 rooms in an area of 1,775 ha with an investment more than \$100 million, according to the local newspaper Sudcaliforniano, published in May 2007. On May 18, 2007 the project began. INAH (Instituto Nacional de Antropología e Historia) in Baja California Sur intervened after May 25 to investigate this tourist project. After negotiation between INAH and the company, a survey and a damage evaluation of the site were conducted. On the basis of these results, the author of this paper wrote a proposal for a salvage project and it was approved by Archaeological Council of INAH. The salvage project started on February 1, 2008.

Eight archaeologists have recorded the lithic distribution in an area more than 4,000 m<sup>2</sup> in which there is an evidence of diverse stages of tool production, including hammerstones, side and end scrapers, blades, and large bifacial preforms. There are numerous cores and flakes of different sizes, as well as retouched flakes. This area was divided in grid of 2 m by 2 m units, in total more than 1,000 units. We delimited altogether 15 concentration areas. Almost 600 units have been recorded in five months. In addition, two areas of 4 m by 4 m were excavated to bedrock.

### **CHARACTERISTICS OF THE SITE**

El Pulguero site is located in the extreme north of the “Sierra Riolítica” named by Hammond (1954). This is the largest recorded site in the Cape region of Baja California. The terrain is characterized by vertical outcrops, rocks, and pebbles of good-quality rhyolite. Various shell middens were located in the coastal zone. In the 1940s, Massey (1955:212) observed at one of the rhyolite quarry site in Pichilingue (BC 70) as follows: “BC 70 is outlined by flakes and artifacts... On the surface of the site there is a considerable variety of large bifacially flaked tool forms. These particular artifacts occur rarely on other sites; therefore it seems reasonable to suppose that these large forms are in reality blanks for the manufacture of other tools.”

Massey’s description of the tool is similar to the bifacial preforms found in El Pulguero site.

### **QUARRIES AND LITHIC WORKSHOPS IN EL PULGUERO**

The tool production areas of El Pulguero vary from 1.2 m<sup>2</sup> to 4,000 m<sup>2</sup>. Some lithic workshops

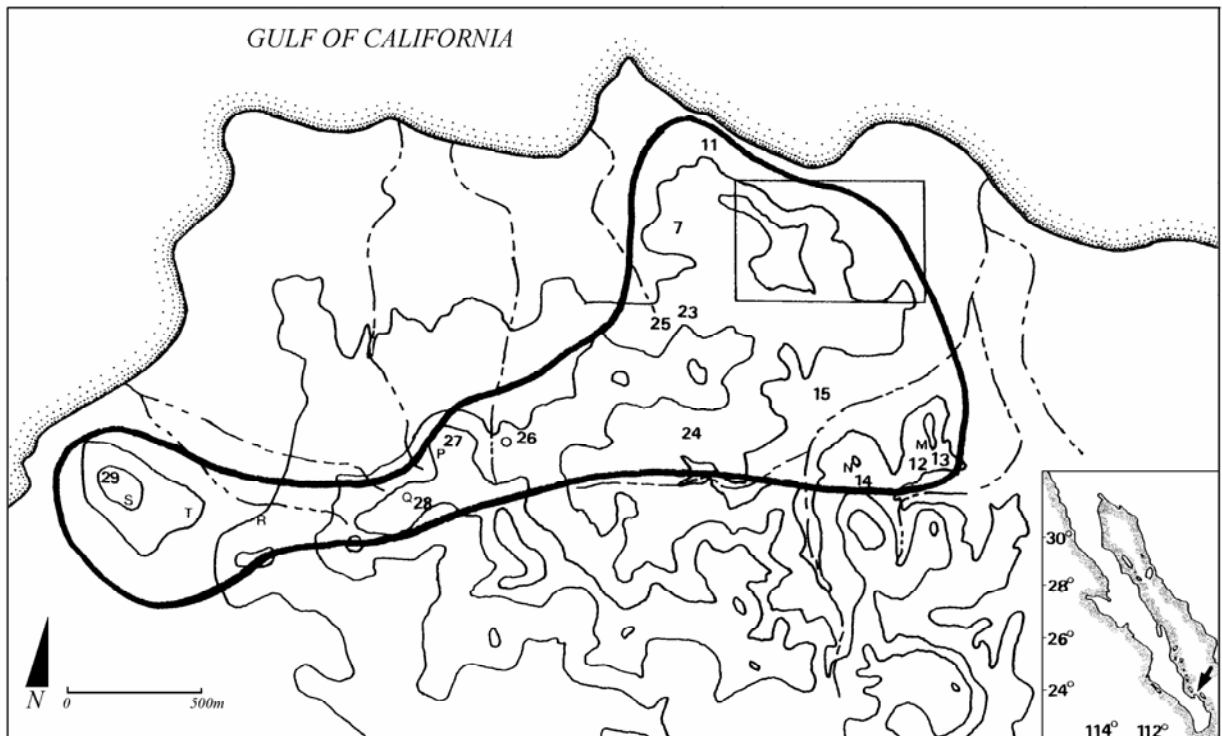


Figure 1. Location of A-16 El Pulguero Suroeste, marked with thick line (taken from Fujita and Poyatos 2007:Figure 3). Numbers corresponded to workshops, and letters designated concentrations of flakes.

are found next to quarries. These workshops exhibit a very redundant assemblage of artifacts: cores, hammerstones, primary flakes, and large bifacial preforms, as well as debitage. On occasion, hammerstones and primary flakes were found in direct association with cores showing the negative marks (Figures 2 and 3). These data provide evidence of primary core reduction activity. In general, the site lacks evidence of final biface work. No retouch marks by pressure were observed in these preforms (Figures 4 and 5). In 1997, 26 bifacial preforms were found, with average length of 18.5 cm, width of 9.2 cm, and thickness of 4.2 cm. In 2007, 52 complete and fragmented bifacial preforms and 20 hammerstones were found, besides more than 12,000 flakes and 1,100 cores on a surface of 5,600 m<sup>2</sup> (40 m by 140 m). There are some fragmented preforms which could have been very large. The form of the extreme parts varies, being either pointed or round in one or both ends. This site is characterized precisely by the high frequency of large elongated bifacial preforms made of different colors (gray, purple, green) of rhyolite, as well as the presence of numerous core reduction areas with or without hammerstones.

### REGIONAL CHRONOLOGY

Although no dating studies have been done in this site, it is probable that this site was used principally in the late period between A.D. 1000 and 1700 (Table 1).

Based on the <sup>14</sup>C dating results obtained in a neighboring excavated shell midden and a cave in Puerto Balandra, we estimate that this region was occupied at least around 6000 B.C. (Fujita and Poyatos 2007). The deposits contain an assemblage of basalt cores and flakes, showing a temporal use of tools [meaning unclear]. On the other hand, the final prehistoric occupation in the shell middens near the El Pulguero site corresponds to the late period of the Cape region, or the Las Palmas Culture, according to the <sup>14</sup>C dates (Fujita 1985, 1999).



*Figure 2. Evidence of stone quarrying at A-16 El Pulguero Suroeste: two boulder cores, and primary flakes. Photo taken by Harumi Fujita.*

The late-period peoples in this region seem to be associated with diagnostic artifacts and human behaviors. The recent investigations realized in the peninsula and the islands indicate that the hunter-gatherer-fishermen of the late period were intensive collectors of large mollusks (pearl oyster and rock oyster) and were expert fishermen, using rafts and capturing marine mammals under good organization to maintain a larger population. We think that changes in prehistoric subsistence and economy affected each aspect of ancient life, including population size, settlement patterns, technology (such as the production of lithic and wooden tools and the increase of use of navigation), and the strategies to obtain resources (Fujita and Poyatos 2007).

It is remarkable that rhyolite predominates in the lithic assemblage of the late period in the northeastern portion of the Cape region, indicating a preference for a locally abundant resource, which was underestimated or not used frequently in the earlier periods. We observed a change from generalized hunter-gatherer economy towards another, which shows a preference for specific objects and foods. For example, archaeological contexts in the two neighboring shell middens revealed a remarkable increase in large mollusks during the late period. In addition, this period is characterized by an intensive exploitation of local quarries, the uniformity of bifacial performs, and a production, distribution, and specific uses of rhyolite bifacial tools. In this period, the Cape region inhabitants used specific sites for resources and practiced particular behaviors, observed in the rhyolite quarries of El Pulguero and other sites, including a



*Figure 3. Rhyolite quarry at A-16 El Pulguero Suroeste. Photo taken by Harumi Fujita.*

preference for pearl oyster and rock oyster, and burial of the dead in selected caves; they probably carried out festivities at some pictograph sites (Fujita 2007; Fujita and Poyatos 2007).

### **EL PULGUERO AND THE FUNCTION OF RHYOLITE PREFORMS**

El Pulguero site contains some distinctive lithic workshops composed of primary flakes extracted from cores, outcrops, and pebbles, with occasional hammerstones and performs of a variety of local rhyolite. The flake concentrations of high density could represent collective activities.

The end use of bifacial preforms of El Pulguero is not resolved yet. We do not have sufficient evidence which indicates the function of these artifacts. However, these artifacts could have been used to cut specific plants to make wood and bone objects, including rafts, paddles, dart-throwers, harpoons, spears, ceremonial boards, awls, spatulas, and cooking implements (Fujita and Poyatos 2007).

Some large bifacial preforms at El Pulguero could have been intended to manufacture large La Paz points or knives. The large La Paz points may have been products of the late period, and the smaller ones may have been manufactured during the middle period, after approximately 3,000 years ago, at some sites in the Cape region. The presence of large La Paz points and knives made of rhyolite found isolated in different places in the Cape region may indicate that these were considered as exchange or social status objects in the Cape region, rather than utility instruments (Carmean 1995).



Figure 4. A large biface perform found in A-16 El Pulguero Suroeste. Photo taken by Harumi Fujita.

Table 1.  $^{14}C$  Dates from archaeological sites near A-16 El Pulguero Suroeste, Baja California Sur.

SITE NUMBER AND NAME	SAMPLE NUMBER	MATERIAL	LEVEL OR DEPTH	MEASURED AGE	CALIBRATED AGE	REFERENCE
Conchero Puerto Balandra	INAH 266	shell	upper level	7855±77 b.p.		Fujita & Poyatos 2007
Cueva Puerto Balandra	INAH 2020	shell	lower level	5008±86 b.p.		Fujita & Poyatos 2007
A-20 Las Pilitas #3	INAH 264	shell	lower level	2268±218 b.p.		Fujita 1985
A-20 Las Pilitas #3	INAH 269	shell	upper level	1028±33 b.p.	AD 1702 to 1951	Fujita 1985
A-15 Ensenada El Pulguero #2	INAH 1966	<i>Ostrea fisheri</i>	45 cm*	1965±76 b.p.	AD 780 to 1160	Fujita & Poyatos 2007

\* from the bottom of a thick stratum of rock oyster shells

## CONCLUSION

Intensive rhyolite core reduction and the initial stages of tool processing and production of bifacial performs were the principal prehistoric activities realized in El Pulguero site in the late period in the Cape region of Baja California. The final stages of tool manufacture and use occurred in other places. We think that bifacial performs were much easier to transport farther than the raw material. The lack of finished elongated bifaces and pressure work on the edges of these artifacts support this interpretation. The majority of these elongated bifaces were probably used to cut plants to make wooden artifacts, such as rafts, paddles, dart-throwers, spears, etc., as a response to population increase. Some bifacial performs might have been intended to make large La Paz points and knives in other places in the Cape region.

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