

Archaeology—Latin America

Shell Tools in Early-Holocene Contexts: Studies of Early Settlements of the American Pacific Coast of Chile

Lucero J. Marcela and Donald S. Jackson

Studies of archaeological samples of the Huentelauquén complex early contexts (FONDECYT Project 1030585) dated between 11,000 and 9,000 RCYBP in the semiarid northern region of Chile (Jackson et al. 1999) show the presence of shell tools made on valves of mollusks, with natural and in some cases slightly modified edges (Lucero 2004a, 2004b).

Microscopic analysis with low augmentation (80x) and high augmentation (scanning electron microscope) of the edges of mollusk valves (*Mesodesma donacium*, *Retrotapes* sp. and Mytilidae) from archaeological contexts has allowed us to detect clear use-wear traces, identified as denticulates, striations, and erosion, though only striations are diagnostic of function (Figure 1A–B). These use-wear traces suggest that the shell instruments were used to cut and scrape, and had other multiple functions.

Analysis of taphonomic control samples allows us to differentiate with some accuracy the natural traces from those produced by anthropic action. At the same time, these experimental studies show the efficiency of using expedient shell instruments and allow us to establish and interpret comparative patterns of microwear use (Lucero 2004a). Other experimental studies also show the use of shells as knives to cut bone; their cut marks are indistinguishable from those made of lithic knives (Toth and Woods 1989).

Naturally edged instruments with traces of use-wear represent 5.4 percent of the analyzed sample, suggesting some planning, an expedient technological strategy more than an opportunist one (Nelson 1991). In contexts with abundant shells, these represent potential instruments used for multiple functions, and thus could have served as an alternative to lithic raw materials. This would have reduced costs in the elaboration of such instruments.

The planned character of this technological strategy is also supported by a long sequence of occupational events at the Punta Ñagué site, spanning more than 1,700 years, from 10,700 to 9000 RCYBP (Jackson and Mendez 2004), in all

Lucero J. Marcela and Donald S. Jackson, Departamento de Antropología, Facultad de Ciencias Sociales, Universidad de Chile, Casilla 10115; e-mails: mlucero@red6.org djackson@uchile.cl

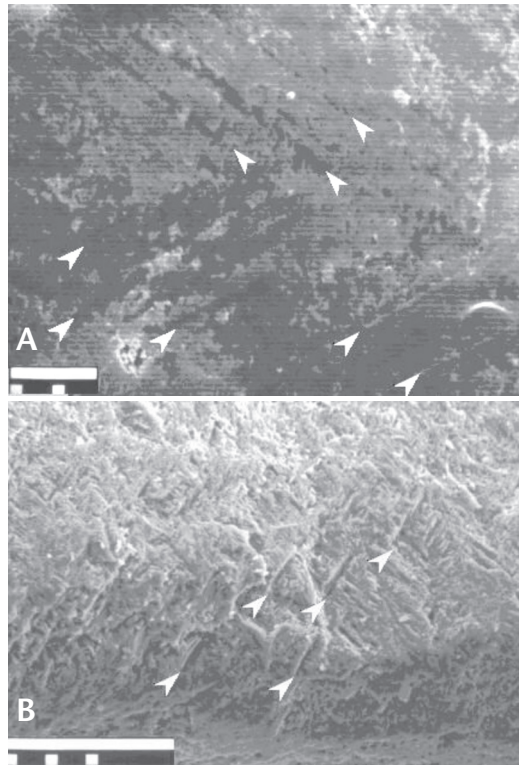


Figure 1. High-power images of use wear identified on mollusk valves from the Huentelauquén complex, Chile (A, diagonal short striations on the edge and above the micro-reticulate edge [300x]; B, intercrossed striations of the inner face, Artifact No. 9 [1500x]).

14

8

9

10

11

of which some shell instruments with used edges have been identified.

The discovery of these expedient shell tools in coastal sites suggests a strong adaptation to the coast, which is also evident in permanent settlement patterns along the coast and a wide and diversified exploitation of sea resources. This was a well-established adaptation of at least 10,000 RCYBP (Llagostera 1977).

Several archaeological sites of the South American Pacific coast show early human settlements with clear cultural contexts dated between 11,000 and 9000 RCYBP (Sandweiss et al. 1998; Stothert and Quilter 1991). These evidences serve to support the hypothesis of an early coastal route for the first settlers' arrival to the continent (Fladmark 1979).

The early archaeological records of the South American coast attest that they are as ancient as settlements in the highlands of the Andean area, and that they are not, as it has been suggested, late settlements derived from Andean traditions.

The expedient shell tools found in the Huentelauquén contexts of the semiarid northern coast of Chile are solid evidence of an early coastal adaptation. This adaptation suggests that the first settlers in South America arrived via a coastal route, using abundant and predictable sea resources that furnished alternative raw material such as shells and at the same time reducing

the uncertainty of dependence on a single technology and the availability of lithic material.

References Cited

- Fladmark, K. 1979 Routes: Alternate Migration Corridors for Early Man in North America. *American Antiquity* 44(1):55–69.
- Jackson, D., and C. Méndez 2004 Primeras Ocupaciones Humanas en la Costa del Semiárido de Chile: Patrones de Asentamiento y Subsistencia. En Prensa, Actas del XVI Congreso Nacional de Arqueología Chilena, Tomé.
- Jackson D., R. Seguel, P. Báez, and X. Prieto 1999 Asentamientos y Evidencias Culturales del Complejo Huentelauquén en la Comuna de Los Vilos, Provincia de Choapa. *Anales del Museo de Historia Natural de Valparaíso* 24:5–28.
- Llagostera, A. 1977 Ocupación Humana en la Costa Norte de Chile Asociada a Peces Local-Extintos y a Litos Geométricos; 9.680 ± 160 AP. *Actas del VII Congreso de Arqueología de Chile*, Tomo I:93–113. Editorial Kultrún, Santiago.
- Lucero, M. 2004a *Evaluación del Uso de Artefactos de Concha en el Poblamiento Inicial del Semiárido de Chile*. Memoria de Título, Departamento de Antropología, Facultad de Ciencias Sociales, Universidad de Chile, 151 p.
- 2004b Huellas de Uso y Tafonomía: Perspectivas para el Análisis de Instrumentos Conquiológicos en el Complejo Huentelauquén. *Werken* 5:27–32.
- Nelson, M. 1991 The Study of Technological Organization. *Archaeological Method and Theory*, Volume 2, edited by M. Schiffer, pp. 57–100. University of Arizona Press, Tucson.
- Sandweiss, D., H. McInnis, R. Burger, A. Cano, B. Ojeda, R. Paredes, M. Sandweiss, and M. Glascock 1998 Quebrada Jaguay: Early South American Maritime Adaptations. *Science* 281:1830–1832.
- Stothert, K., and J. Quilter 1991 Archaic Adaptations of the Andean Región, 9000 to 5000 B.P. *Revista de Arqueología Americana* 4:25–53.
- Toth, N., and M. Woods 1989 Molluscan Shell Knives and Experimental Cut-Marks on Bones. *Journal of Field Archaeology* 16:250–255.