



Spatial and temporal variability in the use of lithic raw materials for flaked stone technology in northeast Chubut Province (North Patagonia) during the Late Holocene



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ABSTRACT

This work presents and discusses the results of the presence of changes in the selection and use of raw materials for flaked stone during the Late Holocene in two areas of northeast Chubut Province: the north coast and the lower valley of the Chubut river (VIRCH). We considered two temporal blocks: 3000–1200 BP, and 1100–400 BP. Three hypotheses were tested: (1) in both areas, there was an overriding exploitation of locally available rocks; (2) rock exploitation was more diversified in VIRCH; and (3) there was an increase in raw materials of extra-regional origin post 1000 BP. Rock sampling aimed at characterizing the regional lithic resource base, and the results of the lithological classification of fourteen lithic sets made it possible to verify the predominant presence of artifacts made of local rocks, including silex and basalt, in both areas and both temporal blocks, and an increment in the record of artifacts made of chalcedony in the second temporal block. At a macro-regional level, the observed temporal tendencies point to similarities and differences with respect to models formulated for the northern and central coast of Patagonia.

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1. Introduction

In the past few decades, technological studies about the archaeology of Atlantic Patagonian coast (from Colorado River and Magellan Strait), have focused on the characterization of the way in which the lithic resources are structured in the environment (sensu Ericson, 1984). Their importance resides in the fact that these studies provide the basic information that allows us to gain insight into: a) the strategies of procurement of raw materials in relation to mobility and the use of space; b) the influence of environmental and/or socio-cultural factors on the preferences or restrictions intervening in the selection of rocks; and c) the choice of different designs and reduction techniques (Binford, 1980; Nelson, 1991; Andrefsky, 2009). In this sense, it is important to mention that these strategies are many times less influenced by environmental and availability factors than by socio-cultural motivations (Flegenheimer and Bayón, 1999; Colombo and Flegenheimer, 2013). This approach makes it possible to integrate technological choices

into the more comprehensive framework of general subsistence strategies and social organization (Nelson, 1991; Andrefsky, 1994).

Therefore, in this paper we will verify the existence of spatial variability and temporal trends in the use of lithic raw materials in northeast Chubut province during the Late Holocene. In order to assess the lithic resource regional base, systematic sampling was conducted in diverse geomorphological units. On the other hand, with the aim of exploring the technological human decisions and their relation with use of space, lithic resource availability and other socio-economic questions, fourteen lithic assemblages recovered from archaeological sites of different antiquity and origin were analyzed (Gómez Otero, 2006; Gómez Otero et al., 2010; Gómez Otero et al., 2013). Finally, the results of both studies are compared.

Two large sampling units (SU) have been chosen: 1) the northern coast (Coast), between 42° S and the north margin of the Chubut River, and 2) the mouth and lower valley of the Chubut River (VIRCH) (Fig. 1). On the basis of previous data (Gómez Otero, 2006), and in an operational manner, we also distinguished two temporal blocks (TB): TB1 corresponds to early Late Holocene (3000–1100 BP) and TB2, to final late Holocene (post 1100 BP). Three hypotheses will be tested: (1) in both areas, there was an overriding exploitation of locally available rocks; (2) the rock

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exploitation was more diversified in VIRCH, and (3) there was an increase in raw materials of extra-regional origin post 1000 BP.

2. Geological framework: landscape units and lithologies

Paleoenvironmental studies (Páez, 1993; Ichazo, 1994; Pardiñas et al., 2000) indicate that in the last two thousand years, current environmental conditions were already established. Therefore, the availability of local rock cannot have changed or suffered substantial variations since then.

The SU Coast includes the littoral area of the north Patagonian gulfs (San Matías, San José and Nuevo), as well as the open sea between Punta Ninfas and Bajo de los Huesos. The only potential rock supply sources come from secondary pebble deposits which are found in different geological positions (berms and coastal strips) and are widely distributed in the area. Plío-Pleistocene Rodados Patagónicos (Fidalgo and Riggi, 1970), of glaciofluvial origin, constitute thick layers of rounded acid volcanic gravel which cover terraces, ravines, and lowland. Beach ridges, which originated during the marine transgressions in the mid-Holocene (San Miguel Fm. sensu Haller, 1981), have pebbles up to 6 cm long of diverse lithologies: granite, quartzite, andesite, rhyolite, silex, and basalt (Gómez Otero et al., 1999). The only primary volcanic rock exposed corresponds to the Marifil Fm. (Malvicini and Llambías, 1974). It is composed of rhyolites, trachytes and ignimbrites associated with tuffs and breccias, and is 80 km northwest of San Matías gulf. However, isolated small ignimbrite fragments or pebbles can be found.

The SU VIRCH begins at Florentino Ameghino Dam and encompasses the lower course of the river to its mouth in Bahía Engaño. To the west, the valley is enclosed by volcanic rocks from Fm. Marifil; to the east, it is developed on sedimentary rocks mainly of marine origin (Ichazo, 1994). In this unit, secondary pebble deposits prevail. However, the joint action of fluvial, alluvial and marine processes promoted more heterogeneous lithological composition and distribution than along the coast. On the terraces,

pediments, and foothills, there are deposits of Rodados Patagónicos (Fidalgo and Riggi, 1970) from the Montemayor Fm. (Ylláñez, 1979) which include sub-rounded acid volcanic pebbles and cobbles, associated with andesite, granitoids, silex, and xylopal (Panza et al., 2002). Floodplains and terrace levels contain acid volcanics and pyroclastic pebbles from Gravas Morgan (Lapido and Page, 1979). The presence of Quaternary deposits is registered in the terraces (I to IV): the first ones (levels I and II) include pebbles (8–15 cm) and blocks (up to 40 cm) of acid rocks, porphyry, and rare milky quartz (Panza et al., 2002). The other levels (III and IV) contain silicified tuff, acid plutonics, basalt, and very few fine-grained greenish metamorphic rocks of smaller size (8–10 cm) and blocks up to 80 cm (Panza et al., 2002). The mouth has a raised paleo-estuary formed by a regressive sea which forms knolls and littoral chains parallel to the axis of the valley. Sedimentary deposits include pebbles of fluvial and marine origin, which are continuously transported, eroded, and altered by the geomorphological dynamics which become more active towards the Atlantic littoral area.

VIRCH offers greater availability and variety of raw materials. However, only through systematic sampling of rocks and their contrast with the archaeological record will we gain knowledge on the selection and use patterns of lithic resources.

3. Archaeological background

This area of study, located between 42° and 43°25' S; 63°35' and 65°03'W (Fig. 1), lies within the archaeological study carried out by Gómez Otero (2006), aimed at gaining a better understanding of spatial-temporal variability in the use of space and the diet in northeast Chubut province. The archaeological record indicates that the area was occupied at least from the Middle Holocene (7400 BP) to 200 BP. Research also showed spatial diversity in relation to the use of landscape. The highest archaeological density was registered in the estuary of the Chubut river, followed, in decreasing order, by the coast of the three gulfs (San Matías, San

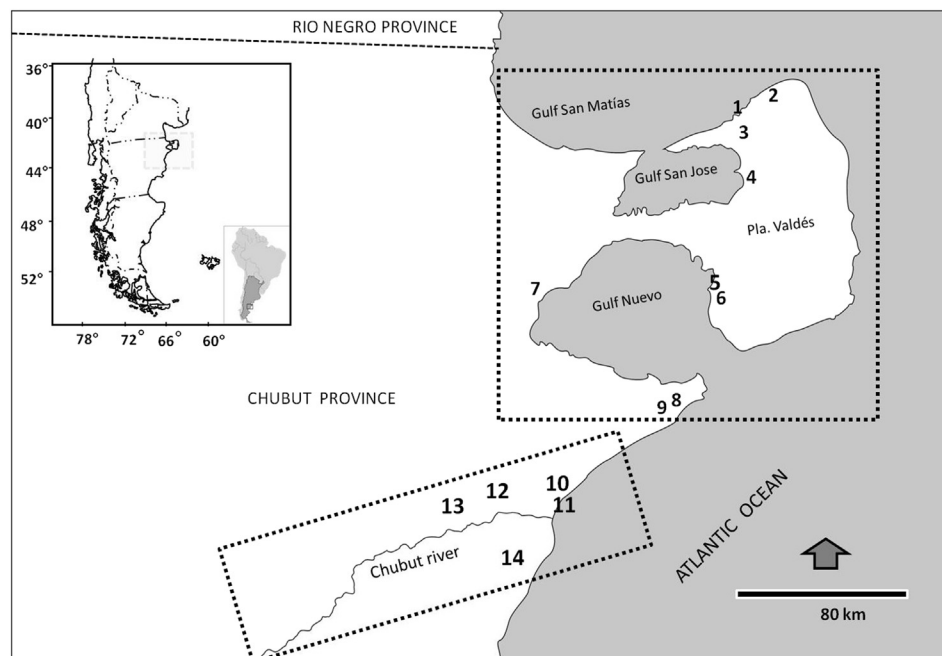


Fig. 1. Map of the study area indicating archaeological locations. References: SU Coast: (1) Las Lisas 2, (2) La Armonía, (3) San Román, (4) Flechero del 39, (5) San Pablo 4, (6) San Pablo 6, (7) Ecocentro, (8) El Pedral, (9) Punta León. SU VIRCH: (10) Barranca Norte 1, (11) Barranca Norte 2, (12) 5 Esquinas, (12) Loma Grande, and (14) Los Cangrejales.

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