Quaternary International xxx (2017) 1–17

Contents lists available at ScienceDirect

Quaternary International

journal homepage: www.elsevier.com/locate/quaint

From the use of space to territorialisation during the Early Holocene in Taltal, coastal Atacama Desert, Chile

Diego Salazar [a, b, *], Camila Arenas [a], Pedro Andrade [c], Laura Olguín [b], Jimena Torres [d, e], Carola Flores [f], Gabriel Vargas [g], Sandra Rebolledo [h], César Borie [b], Consuelo Sandoval [a], Claudia Silva [i], Ayelén Delgado [j], Nicolás Lira [a], Camilo Robles [k]

[a] Departamento de Antropología, Universidad de Chile, Ignacio Carrera Pinto 1045, Santiago, Chile
[b] Programa de Doctorado UCN-UTA, Universidad Católica del Norte, Gustavo Le Paige 380, San Pedro de Atacama, Chile
[c] Carrera de Antropología, Universidad de Concepción, Víctor Lamas 1290, Concepción, Chile
[d] Instituto de la Patagonia, Universidad de Magallanes, Avenida Bulnes 01890, Punta Arenas, Chile
[e] UMR 7041 Arscan, France
[f] Centro de Estudios Avanzados en Zonas Áridas (CEAZA), Facultad de Ciencias del Mar, Universidad Católica del Norte, Ossandón 877, Coquimbo, Chile
[g] Departamento de Geología, Universidad de Chile, Plaza Ercilla 803, Santiago, Chile
[h] Ma Evolution, Patrimoine naturel et sociétés, Spécialité Quaternaire et préhistoire, Muséum national d'histoire naturelle, 57 rue Cuvier, 75005 Paris, France
[i] Guillermo Franke 2318, Ñuñoa, Santiago, Chile
[j] Centro de Estudios Arqueológicos e Históricos Aikén, San Diego 1499, Santiago, Chile
[k] Ricardo Lyon 3177, Ñuñoa, Santiago, Chile

A R T I C L E I N F O

Article history:
Received 8 May 2017
Received in revised form
6 September 2017
Accepted 25 September 2017
Available online xxx

Keywords:
Coastal northern Chile
Early Holocene
Huentelauquén cultural complex
Territorialisation

A B S T R A C T

In this paper, we present recent data on Early Holocene human occupations from Taltal, in the coast of the Atacama Desert. We focus on evidences of mobility and subsistence economy, discussing the data in terms of a concept of territoriality adapted from cultural geographers working with hunting-gathering societies. We attempt to show that the Huentelauquén Cultural Complex, usually considered the earliest evidence of human occupation in the coast of northern Chile, exhibits an already consolidated territorialisation process. We question whether it represents the earliest phases of the peopling process or if such evidence are still lacking at a regional level. We try to go beyond the characterization of Huentelauquén Cultural Complex as an early maritime adaptation, understanding it as the earliest socio-territorial identity known to date for the Arid Coast of northern Chile.

1. Introduction

Unlike physical space, a territory is a “lived” as well as a “social” and “cultural” landscape (Bonnemaison, 2005; Collignon, 2006), a world where human communities build and reproduce their identity and historical knowledge. The transformation of a pre-existing physical space into a territory is thus a historical process we here call “territorialisation”. From this perspective, territoriality is distinct from tenure or “ownership” over the land (Ingold, 1987) and is more related to human “affiliation” or “connection” to the landscape (Collignon, 2006, pp. 44). This “affiliation” is the dynamic outcome of the recurrent material engagement with a given physical landscape through the mediation of social practices and symbolic representations. As such, territoriality is not only determined by cultural norms or a judicial system, but constructed through experience and reproduced in social practices (Pauketat, 2001).

In hunter-gatherer societies, the use of space and the appropriation of the “environment” make up an important part of the everyday experiences and practices through which territoriality is constructed, materialized and reproduced. Therefore, mobility and the exploitation of resources are not only an adaptive response which satisfies subsistence needs at specific environmental and technological settings (Binford, 1980), but they also constitute important ingredients in the process of territorialisation itself. Together with geographic knowledge of resources and environments, and cultural affiliation with “places” through narratives and

* Corresponding author. Departamento de Antropología, Universidad de Chile, Ignacio Carrera Pinto 1045, Santiago, Chile.
E-mail address: dsalazar@uchile.cl (D. Salazar).

https://doi.org/10.1016/j.quaint.2017.09.035
1040-6182/

memory, mobility and resource exploitation are some of the main social practices through which hunter-gatherers build, reproduce and change their socio-territorial identities through time.

From this perspective, human colonization of the Americas occurred through the knowledge of, and effective adaptation to, new environments (Borrero, 1999, 2015). But it was also a process of ascribing cultural meaning to these environments (Gillespie, 2007). Moreover, it was a process of territorialisation through which socio-territorial identities were built and reproduced, changing a new land into a historical network of significant "places" for certain communities of hunter-gatherers. How these processes transpired is a difficult question to answer from the archaeological record alone. However, we may attempt to see the "colonization" phase of the human peopling of the Americas (*sensu* Borrero, 1999, 2015) as an advanced process of enculturation and territorialisation.

In this paper, we use this approach to understand the earliest human evidences known to date for the Taltal area, in the hyperarid southern Atacama coastal desert, in an attempt to identify the first human territories constructed and reproduced in this area. We will begin by presenting the environmental context where this early territorialisation process occurred and will then move on to discuss the archaeological evidence of mobility and subsistence during the Early Holocene. From there we will attempt to interpret the use of space and the construction of early socio-territorial identities in the Arid Coast.

2. Environmental setting: past and present

Taltal (ca. 25° S) is located at the southern edge of the hyperarid coast of the Atacama Desert (Fig. 1), which is considered the most arid environment worldwide. Topographically, the area presents a narrow strip of coastal shelf (~500 m wide), flanked on the west by the Pacific Ocean and on the East by the western margin of the Coastal Cordillera, which shows a marked climb up from the coast to 2000 m above sea level. To the east of this Coastal Cordillera, the hyperarid Atacama Desert dominates until the foothill of the Andes, some 100 km eastward.

Mean total annual rainfall in coastal Taltal area reaches 15–20 mm, diminishing to almost zero northward, with 4 mm/year at 23.5°S and 1 mm/year at 20.2°S. Precipitation can be absent during several years or even decades along this coast, being interrupted by the sporadic occurrence of torrential rainfall events during strong El Niño Southern Oscillation (ENSO) episodes (Vargas et al., 2000). Vegetation is limited due to the lack of perennial rivers (Rundel et al., 1991; Houston, 2006), while small springs mainly fed by coastal rains linked to ancient ENSO episodes are today the main source of fresh water (Herrera and Custodio, 2014).

Year-round sources of moisture also include the "*Camanchaca*" or coastal fogs trapped to the coastal mountains and locked at 900–1000 m above sea level (masl) by an atmospheric inversion layer associated to the interaction between the South Eastern Pacific Subtropical Anticyclone, cold sea surface waters of the Humboldt Current System and coastal upwelling (Cereceda et al., 2008). Coastal fogs and episodic rainfall provide enough humidity to sustain fog-oases or "*Lomas*" vegetation between 200 and 900 m.a.s.l. (Rundel et al., 1991; Marquet et al., 1998). Endemic species of cacti (*Copiapoa, Eulychnia)* and shrubs *(Gypothamniumn, Euphorbia, Nolana, Heliotropium, Sisymbrium*) are found in this unique type of ecosystem, while some vegetation can also be found in spring oases and low elevation rocky outcrops (Rundel et al., 1991). Communities of vertebrate and invertebrate fauna are associated with the spatial distribution of "*Lomas*" vegetation and groundwater-spring areas. These include terrestrial mammals (*Lama guanicoe, Lycalopex griseus, Lycalopex culpaeus, Pyllotis darwin*), reptiles (*Liolemus nigromaculatus*), birds (e.g. *Geranoaetus melanolecus, Agriornis montana, Diuca diuca,* Troglodytesaedon) and land snails (e.g. *Plectostylus broderipii, Plectostylus puctulifer, Chiliborus rosaceus*) (Marquet et al., 1998; Araya and Catalán, 2014).

In contrast with the hyper-aridity of the terrestrial environment, marine and coastal ecosystems along the Atacama Desert are one of the most productive in the world (Montecino et al., 2005; Thiel et al., 2007). This high productivity is associated to nutrient-rich waters of the Humboldt Current System together with strong coastal upwelling cells, and modulated by interannual, interdecadal and centennial oceanographic changes related to ENSO and ENSO-like ocean-atmosphere variability (Barber and Chavez, 1983; Montecino et al., 2005; Vargas et al., 2006). A complex trophic chain is associated with these environments, including diverse species of sea-weed (e.g. *Lessonia, Durvillaea* and *Macrocystis*), molluscs (e.g. *Concholepas concholepas, Fissurellas, Tegula atra*), fish (e.g. *Trachurus murphyi, Merluccius gayi, Genypterus* sp.) and cetaceans (e.g. *Eubalaena australis, Megaptera novaeangliae, Delphinus delphis*). In addition, rockeries along the coast are home of abundant pinnipeds (e.g. *Otaria flavescens, Arctocephalus australis, Lontra felina*) and marine birds (e.g. *Stictocarbo gaimardi, Larus modestus, Pelecanus Thagus*) (Medina et al., 2007; Thiel et al., 2007). The hyperarid coastal climate setting of the Atacama Desert also contrasts with the semiarid to arid environment that characterize the Precordillera and Altiplano, located at higher altitudes in the same region, which are seasonally affected by summer precipitations associated to easterly weather systems (Garreaud et al., 2003), resulting in a strong zonal (east-west) precipitation gradient (De Porras et al., 2017).

Present characteristics of terrestrial, coastal, and marine ecosystems of the study area cannot be assumed to have been similar during the Late Pleistocene and Early Holocene. On the contrary, past changes in environmental conditions and the productivity of these ecosystems have to be considered in order to better understand the physical landscape with which early hunting-gatherer populations interacted. During the Pleistocene/Holocene transition, between 13,500 and 11,700 calibrated years before presente (Cal BP), the southern Atacama Desert seems to have been subjected to a zonal gradient even stronger than today. Several paleoclimate records suggest wetter conditions than during the present time at high altitudes, due to the Central Andean Pluvial Event (CAPE II) dated between 13,800 and 9800 cal BP (Latorre et al., 2006; Quade et al., 2008; Gayo et al., 2012; Sáez et al., 2016; De Porras et al., 2017). Increased rainfall during this period at high elevations favoured higher phreatic levels due to increased recharge of groundwater systems (Sáez et al., 2016), and active ravines flowing towards lower altitudes, where local springs, wetlands and a more vegetated landscape would have developed (Latorre et al., 2002; Nester et al., 2007; Quade et al., 2008; Gayo et al., 2012; Díaz et al., 2012).

On the contrary, coastal records suggest for this period near-absent torrential rainfall episodes which would have implied depleted recharge of coastal groundwater systems, concomitantly with enhanced southerly winds (Vargas et al., 2006; Herrera and Custodio, 2014). However, isotopic ($\delta^{18}O$) results from mollusc shells from La Chimba-13 site, located ca. 23.5°S, suggest coastal sea surface temperatures (SST) several degrees lower than present during the period comprised between 10,550 and 9120 cal BP (Vargas et al., 2006). Ongoing analyses from modern and fossil mollusc shells from archaeological sites around Taltal-Paposo (ca. 25°S) have provided similar results, supporting the interpretation of prevailing regional cooler SST and intensified coastal upwelling during the Early Holocene (Flores et al., 2017). These conditions would have implied high productivity for marine and littoral ecosystems, since in upwelling habitats invertebrate and algae grow faster and therefore their size and abundance is higher than in