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## Chronological distribution and disturbance factors to evaluate population dynamics in Western Pampas, Argentina



Mónica Alejandra Berón

CONICET, University of Buenos Aires, UNICEN, Argentina

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### ABSTRACT

The radiocarbon chronology of the sites and cultural sequences is, at the regional level, a benchmark for evaluating different types of processes: cultural, demographic, taphonomic, environmental. Although it is assumed that chronological signal is closely related to the density and intensity of the processes of settlement, colonization, occupation and use of spaces and landscapes, this signal is mediated by many complex factors affecting its representation. In the case of the province of La Pampa (Argentina), which covers the western part of the Pampean region, where research data discussed in this paper are developed, several of these factors should act or be present. However, in the present state of research in the region it is possible to assess and discuss the significance of the radiocarbon signal, not only intra – regionally but in correlation with neighboring areas. In this paper a set of published radiocarbon dates ( $n = 64$ ) is presented, that constitute all available Western Pampa published  $^{14}\text{C}$  dates. While still scarce and random, these dates establish that the timescale in which colonization events and use of regional space happened, archaeologically evaluated, covers a span comprised between mid-Early Holocene and final Late Holocene. The results will be discussed in comparative terms, into two scales: the intra and inter-regional and considering different type of archaeological sites.

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### 1. Introduction

The radiocarbon chronology of the sites and cultural sequences is, at the regional level, a benchmark for evaluating different types of processes: cultural, demographic, taphonomic, environmental (Surovell and Brantingham, 2007; Peros et al., 2010; Williams, 2012). Although it is assumed that a chronological signal is closely related to the density and intensity of the processes of settlement, colonization, occupation, and use of spaces and landscapes, this signal is mediated by many complex factors affecting its representation. These factors should be evaluated in micro- and macro-regional form and the multidimensionality of effects and consequences, whenever possible.

There is a strong influence from research biases, both thematic and spatial. Certain environments such as river valleys, meandering rivers, coasts, volcanic deposits, dune fields and desert landscapes with high erosivity, mean that archaeological sites have less chances of remaining over time or of maintaining their integrity. In

recent years, several verification or correction tests of these biases have been developed, under the premise that: “The crux of the argument is that the longer something is in existence, the more chances it has to be removed from the archaeological record by taphonomic processes such as erosion and weathering thereby causing over-representation of recent events relative to older events” (Surovell et al., 2009: 1715).

In the case of the province of La Pampa (Argentina), which covers the western part of the Pampean region, several of these factors should act or be present. Although the archaeology of this area awakened the interest of researchers early in the 20th century (Outes, 1904), research was characterized for decades by discontinuity and a lack of systematic study. This was partly due to the difficulties associated with the archaeological material, mostly surficial and, in another sense, the lack of appreciation showed by some researchers regarding the characteristics of the archaeological record of the hunter–gatherers of this broad sector, compared with Patagonia. However, in the present state of research in the region it is possible to assess and discuss the significance of the radiocarbon signal, not only intra-regionally but in correlation with neighboring areas.

*E-mail addresses:* [monberon@retina.ar](mailto:monberon@retina.ar), [monberon56@yahoo.com.ar](mailto:monberon56@yahoo.com.ar).

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In this paper, a set of published radiocarbon dates ( $n = 64$ ) is presented, that constitute all available Western Pampa  $^{14}\text{C}$  dates (Table 1). While still scarce and random, these dates establish that

the timescale in which colonization events and use of regional space happened, archaeologically evaluated, covers a span between mid-Early Holocene and final Late Holocene.

**Table 1**  
Radiocarbon information of Western Pampa.

No	Site	Unit/Level	Sample	Code	$^{14}\text{C}$	$\pm$	Reference
1	Casa de Piedra. Sitio 1	Ocup.Inf.-210 cm profundity	Charcoal	I 12067	8620	190	Gradín et al., 1984
2	Casa de Piedra. Sitio 1	Ocup.Inf.-210 cm profundity	Charcoal	I 12159	7560	230	Gradín et al., 1984
3	Casa de Piedra. Sitio 1	Ocup.Medias -100 cm profundity	Charcoal	I 12065	6080	120	Gradín et al., 1984
4	Casa de Piedra. Rinc.Giles C.P.	34 a 42 cm profundity	Charcoal	AC 0731	320	120	Berón, 1991
5	Casa de Piedra. Rinc.Giles C.P.	53 cm profundity	Charcoal	AC 0729	700	100	Berón, 1991
6	L.Tapera Moreira-Sitio 1	Level II	Organic residue in pottery	UGAMS 7446	360	25	Musaubach and Berón, 2012; Berón, 2013
7	L.Tapera Moreira-Sitio 1	Level XXIV	Charcoal in crotovine	Beta 82555	450	70	Berón and Scarafoni, 1993; Berón 1997, 2010a,b
8	L.Tapera Moreira-Sitio 1	Level III	Charcoal	Beta 81694	510	60	Berón 1997, 2004, 2013
9	L. Tapera Moreira. Sitio 5	Level III	Charcoal	Beta 91938	730	40	Berón 1997, 2004, 2013
10	L. Tapera Moreira. Sitio 5	Level IV a	Charcoal	Beta 81698	740	50	Berón 1997, 2004, 2013
11	L.Tapera Moreira-Sitio 1	Level IV	Charcoal	LP 265	1220	60	Berón 1997, 2004, 2013
12	L. Tapera Moreira. Sitio 5	Level IIa	Charcoal	LP 340	1710	90	Berón 1997, 2004, 2013
13	L.Tapera Moreira-Sitio 1	Level Q XXV	Charcoal	UGAMS 7445	1750	25	Berón 2013
14	L.Tapera Moreira-Sitio 1	Level VII	Charcoal	LP 343	1830	80	Berón 1997, 2004, 2013
15	L.Tapera Moreira-Sitio 1	Level XI	Charcoal	LP 352	1860	100	Berón 1997, 2004, 2013
16	L.Tapera Moreira-Sitio 1	Level IX	Charcoal	Beta 81695	1900	70	Berón 2004, 2013
17	L.Tapera Moreira-Sitio 1	Level XII	Charcoal	LP 358	1970	90	Berón 2004, 2013
18	L.Tapera Moreira-Sitio 1	Level X	Charcoal	LP 275	2140	70	Berón 2004, 2013
19	L.Tapera Moreira-Sitio 1	Level XXVI	Charcoal	Beta 91935	2200	40	Berón 2004, 2013
20	L.Tapera Moreira-Sitio 1	Level XX	Charcoal	Beta 82557	2350	70	Berón 1997, 2004, 2013
21	L. Tapera Moreira-Sitio 3	Burial 1	Human bone	Beta 82558	2630	60	Berón 1997, 2004, 2013
22	L. Tapera Moreira. La Lomita	Burial 1	Human bone	Beta 91934	2960	50	Berón 1997, 2004, 2013
23	L.Tapera Moreira-Sitio 1	Level XVII	Charcoal	LP 264	3040	80	Berón 2004, 2013
24	L.Tapera Moreira-Sitio 1	Level XIII	Charcoal	Beta 91936	3500	80	Berón 1997, 2004, 2013
25	L.Tapera Moreira-Sitio 1	Level XIII	Charcoal	AA35955	3685	40	Berón 2004, 2013
26	L.Tapera Moreira-Sitio 1	Level XXVIII	Charcoal	Beta 82556	3900	60	Berón 1997, 2004, 2013
27	L.Tapera Moreira-Sitio 1	Level XXVIII	Charcoal	AA35954	3995	50	Berón 2004, 2013
28	L.Tapera Moreira-Sitio 1	Level XXI	<i>Lama guanicoe</i> phalanx	Beta 91937	4550	60	Berón 1997, 2004, 2013
29	Sitio Chenque I	Burial 3	3rd left upper molar	UGAMS 02001	730	50	Berón et al., 2007, 2013
30	Sitio Chenque I	Burial 4	3rd left upper molar	UGAMS 4416	860	20	Berón et al., 2007, 2013
31	Sitio Chenque I	Burial 7	3rd left upper molar	AA 35952	904	43	Berón et al., 2007, 2013
32	Sitio Chenque I	Burial 8/9	3rd left upper molar	AA 35953	901	43	Berón et al., 2007, 2013
33	Sitio Chenque I	Burial 10	3rd left upper molar	UGAMS 7435	790	25	Berón et al., 2007, 2013
34	Sitio Chenque I	Burial 14	Left upper incisor	UGAMS 10624	700	40	Berón et al., 2007, 2013
35	Sitio Chenque I	Burial 15	Human hand phalanx	UGAMS 10625	830	40	Berón et al., 2007, 2013
36	Sitio Chenque I	Burial 16	1st proximal hand phalanx	UGAMS 10626	370	40	Berón et al., 2007, 2013
37	Sitio Chenque I	Burial 17	3rd right upper molar	UGAMS 02002	990	60	Berón et al., 2007, 2013
38	Sitio Chenque I	Burial 18	1st inferior right molar	UGAMS 01999	890	30	Berón et al., 2007, 2013
39	Sitio Chenque I	Burial 19	2nd left inferior molar	UGAMS 7436	720	20	Berón et al., 2007, 2013
40	Sitio Chenque I	Burial 21/23	3rd left upper molar	UGAMS 02003	320	30	Berón et al., 2007, 2013
41	Sitio Chenque I	Burial 25	3rd left upper molar	UGAMS 4415	435	20	Berón et al., 2007, 2013
42	Sitio Chenque I	Burial 27	3rd left upper molar	UGAMS 02000	370	30	Berón et al., 2007, 2013
43	Sitio Chenque I	Burial29	3rd right upper molar	UGAMS 02004	390	30	Berón et al., 2007, 2013
44	Sitio Chenque I	Burial30	3rd upper molar	UGAMS 7437	890	20	Berón et al., 2007, 2013
45	Sitio Chenque I	Burial 34	Cuneiform	UGAMS 02005	1050	30	Berón et al., 2007, 2013
46	Sitio Chenque I	Burial 38	1st right upper molar	UGAMS 7438	360	20	Berón et al., 2007, 2013
47	Sitio Chenque I	Burial 39 (2)	3rd left upper molar	UGAMS 7439	290	25	Berón et al., 2007, 2013
48	Sitio Chenque I	Burial 40	3rd left upper molar	UGAMS 02007	390	30	Berón et al., 2007, 2013
49	Sitio Chenque I	Burial 41	<i>Canis familiaris</i> - rib	UGAMS 02006	930	30	Berón et al., 2007, 2013
50	Sitio Chenque I	Superior Unit-E/6-II-1(z)	3rd left upper molar	AA 35950	1029	43	Berón et al., 2007, 2013
51	Sitio Chenque I	Superior Unit -E/6-II-3(z)	3rd left upper molar	AA 35951	869	43	Berón et al., 2007, 2013
52	Sitio Chenque I	Superior Unit- sector 2 N° 305	1st left upper molar	UGAMS10627	740	70	Berón et al., 2007, 2013
53	Sitio Chenque I	Superior Unit-D/4,IV, sector 2 N° 715	2nd right inferior premolar	UGAMS 10628	730	70	Berón et al., 2007, 2013
54	Loma Chapalcó	Multiple burial, commingled-MNI 6	Proximal hand phalanx	UGAMS 02008	3040	30	Curtoni 2007, Berón et al., 2009
55	Chillhué 1	Primary simple burial	1st left upper molar	UGAMS 02009	1930	30	Berón et al., 2006; Berón and Luna 2009
56	Bajo de Atreuco	Primary simple burial	2nd left lower molar	UGAMS 4414	2635	25	Berón et al., 2013
57	La Enriqueta	Multiple burial, commingled-MNI 9	Bone (cuneiforme)	UGAMS 4418	1005	25	Berón and Carrera Aizpitarte, 2013
58	Cuchillo Co	Primary simple burial	Bone (rama mandibular)	UGAMS 4417	3035	25	Berón et al., 2013
59	Médano Petroquímica	Multiple burial- Pqca 5.1.1	Human rib	AA 71847	896	58	Mendonça et al., 2010

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