

Geochemical Sourcing of Obsidian Fishtail Projectile Points:
Studies for the Somuncura Plateau (Río Negro, Argentina)

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Fishtail projectile points (FTPP) are one of the main technological proxies employed to assess early human occupations in the Americas. These items have a wide but discontinuous archaeological signal. Several specimens have been recently recovered in the Somuncura Plateau (Río Negro Province, Argentina), particularly in the Amigo Oeste (AW) site, emplaced on top of one of the low hills forming the Los Dos Amigos landform (Figure. 1a and b). There are 112 FTTP specimens made from several raw materials, of which eight correspond to obsidian. This record is extremely interesting because the use of this rock for making FTTP is not common in South America. With the AW site at Somuncura along and with El Inga in Ecuador (Mayer Oakes 1986), only two cases are known so far.

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Here we present an X-ray fluorescence (XRF) geochemical analysis of six obsidian FTPPs in order to evaluate the diversity of chemical-types represented and to assess their geographic sources. The obsidian samples were analyzed in the Archaeology laboratory at Universidad Nacional de Cuyo with a Bruker III-V portable XRF spectrometer equipped with a rhodium anode operating at 40 kV and 17 μ A. Samples were counted for 180 seconds each to obtain data for eight elements (i.e., Fe, Zn, Ga, Rb, Sr, Y, Zr and Nb). Peak areas were converted to element concentrations using an instrument calibration defined by analyzing a series of obsidian source samples previously characterized by neutron activation analysis (NAA) and XRF in the Archaeometry Laboratory at the University of Missouri Research Reactor.

Results

As mentioned, we analyzed six FFTP from the top of AW site (Figure 1c). In addition, we also analyzed two naturally occurring obsidian nodules from Laguna Yahmoc (LY), 10.5 km southeast of AW and two nodules from Talagapa 44 (T44) located 18 km west of AW (Figure 1b). These local source samples were compared to abundant information available for north Patagonian and Cuyo sources, tested by XRF and NAA (Giesso et al., 2011; see also Barberena et al., 2011).

Figure 1:

- a) Map with main obsidian sources from north Patagonia region. b) Map with archaeological sites.
- c) FFTP from AW used in obsidian source analysis.

The source samples from Laguna Yahmoc and Talagapa are chemically different from one another. On a wider scale, these two sources do not correspond to the sources previously analyzed

by XRF from northern and central Neuquén, Mendoza and Central Chile nor to specimens from archaeological sites in these regions (Giesso et al., 2011, Figure 1 a and b). Comparisons between these results and those also obtained by XRF by Charles Stern (2004; Stern et al., 2007) for the Cerro Castillo, Sacanana and Sierra Chata sources in the Chubut Province located ca 100 km south of AW need further evaluation since the calibrations employed are different

Of the six points analyzed, five are chemically similar (group Somuncura 1), and share a compositional profile similar to the two nodules from Yahmoc. This would indicate a local provenience of most of the FPHP studied here. On the other hand, one point (specimen 269) is chemically different and is assigned to the Somuncura 2 group (Figure 2), being considered as coming from an unknown source.

Figure 2:

a) Table displays chemical composition samples. b) Plot of Zirconium (Zr) vs. Strontium (Sr)

The two nodule samples from Talagapa do not correspond to any of the artifacts. It must be mentioned that this location shows only small-sized nodules that would not be ideal for producing tools. Therefore, it remains a possibility that Talagapa was not used as a lithic source. The nodules from Yahmoc are also small in comparison to that required for producing FPHP, but the geochemical similarity suggests the availability of larger nodules. The extent of secondary geomorphic processes will indicate the spatial extent of the availability of nodules that are chemically similar. In other words, informs on the size of the source. Thus we can predict that the Laguna Yahmoc source is larger and that larger nodules should be present in areas of secondary

redeposition of obsidian.

Conclusions

The preliminary results presented allow an initial assessment of the spatial and technological organization of early human societies in northern Patagonia. Most of the lithic provisioning is of local character, indicating the existence of knowledge on the regional structure of resources, particularly if we consider that the obsidian sources are not ubiquitous. If the precise sources for these materials were emplaced in the southern area of the Somuncura Plateau, in Chubut Province, this would suggest a long-range of movement.

We have presented preliminary geochemical data for obsidian from the northern Somuncura Plateau. Important steps remain: 1) geoarchaeological assessment of the obsidian sources, 2) expand geochemical analyses for source samples, 3) seek ways to integrate the important geochemical data produced by colleagues employing other methods and calibrations. These issues will allow us to construct a more accurate interpretation of human mobility and social interaction in northern Patagonia.

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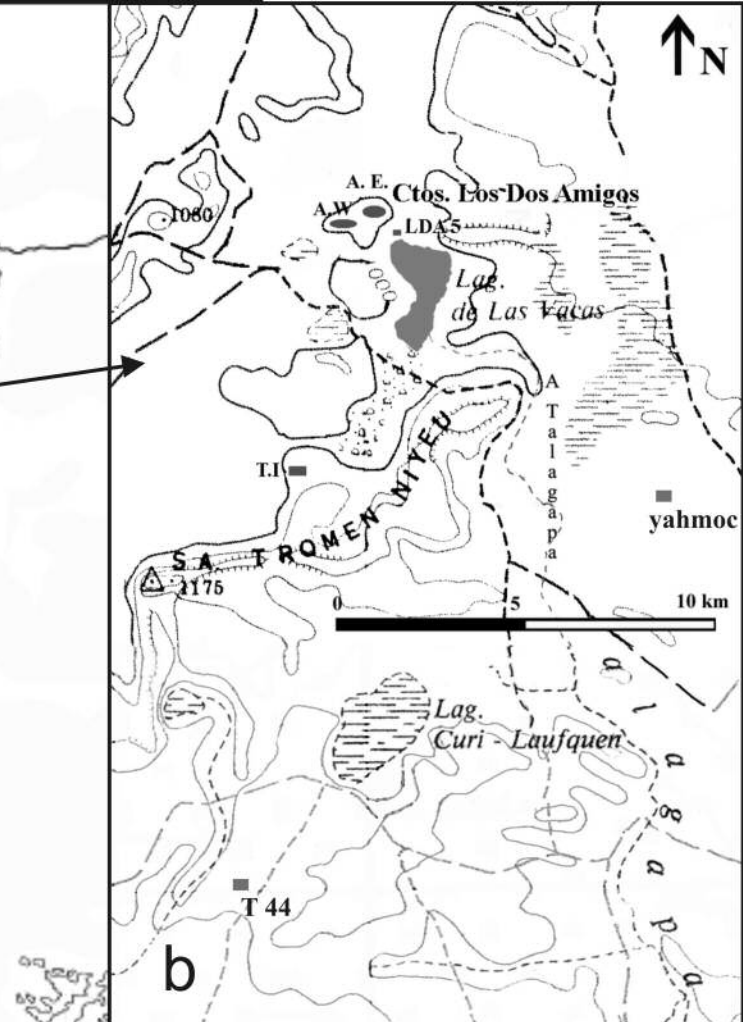
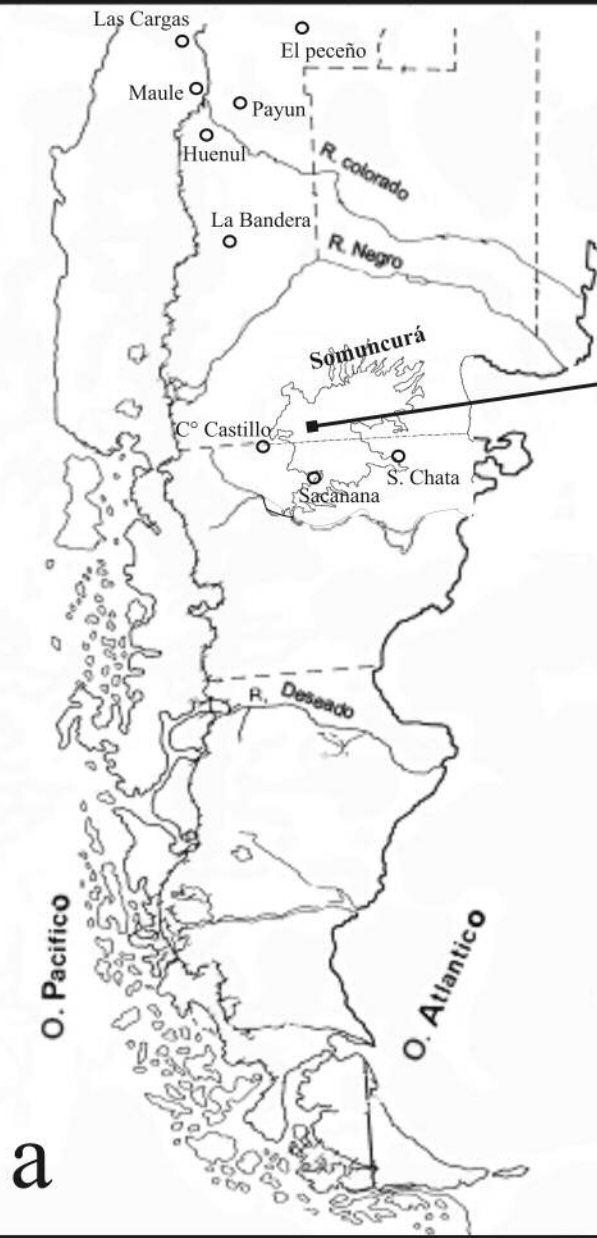
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Borrador - Draft



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site name	sample	chemgrp	K	Ti	Mn	Fe	Zn	Ga	Rb	Sr	Y	Zr	Nb	Pb	Th
Amigo Oeste (AW)	PCP-218	Somuncura-1	36664	895	297	9990	81	18	240	8	45	316	122	28	18
Amigo Oeste (AW)	PCP-229	Somuncura-1	37316	774	78	10992	106	18	241	10	46	317	116	27	22
Amigo Oeste (AW)	PCP-239	Somuncura-1	37334	758	193	11572	97	19	248	10	48	393	128	30	25
Amigo Oeste (AW)	PCP-262	Somuncura-1	39331	618	114	10710	95	18	237	10	45	341	109	24	18
Amigo Oeste (AW)	PCP-362	Somuncura-1	38397	605	81	10657	102	18	242	7	47	296	116	29	23
Amigo Oeste (AW)	PCP-269	Somuncura-2	37977	707	167	14766	147	21	259	11	59	682	133	28	25
Arroyo Talagapa	TALAGAPA-1	Talagapa	34478	1144	429	16545	174	23	226	9	63	968	152	26	27
Arroyo Talagapa	TALAGAPA-2	Talagapa	36955	955	508	16484	194	24	255	12	71	1050	162	36	31
Yahmoc	YAHMOC-1	Yahmoc	37840	503	176	10079	125	19	273	12	63	307	147	34	29
Yahmoc	YAHMOC-2	Yahmoc	38474	551	318	9684	120	19	275	13	60	305	149	32	29

