

Regional archaeological visibility and preservation in arid environments: incidence of geo-environmental processes (Yocavil Valley, Northwest Argentina)

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The Yocavil Valley is a north-south oriented tectonic valley measuring ca. 120 x 30 km, limited by the Cumbres Calchaquíes and the Sierra del Aconquija to the east and the Sierra de Quilmes to the west, and is discharged by the Santa María river. It is characterized by an arid climate and scarcely developed soils.

Our study area corresponds approximately to the central third of the Sierra de Quilmes. We have studied the use of space at a regional scale and its changes during the pre-Hispanic agrarian stage (ca. 100-1535 AD). We can show the impact of geo-environmental processes on the archaeological visibility, preservation and consequently the resulting spatial patterns.

We integrated topographic, geological, soil and hydrological data into a geomorphological map of the study area. Surface surveys were carried out by transects that repeatedly linked the hillside with the valley floor, registering archaeological sites and collecting surface archaeological finds. In three areas, we excavated pits along the line of greatest slope. In the pits, stratigraphic profiles were documented and samples analyzed for grain-size, morphology, composition, phytolith content. Taphonomic traces were registered for the ceramic assemblages, including size, shape and rounding.

As a result, areas were differentiated by their archaeological contexts. In the highest part of the piedmont, sedimentation dominates over erosion, architectural structures are visible on the surface and archaeological materials are found up to 50 cm depth. In the middle part of the piedmont, deposits with archaeological evidence are scarce although architectural structures are perceived. Finally, in the distal part sedimentation was dominant, with presence of pre-Hispanic materials up to 6 m depth. These differences determine that the archaeological visibility is greater in the upper and middle part of the piedmont than in the distal end. Subsurface preservation is greater in the lower part and the highest parts of the piedmont, compared to the middle part, where it is scarce.

The distribution of surface and excavated pottery sherds reflects these differences of formation processes, controlled by topography and thus the recorded archaeological spatial structure. The high frequency of archaeological remains in the proximal part of the piedmont matches with the location of persistently occupied residential and productive areas. The low number of sherds in the mid-piedmont sector match with the location of productive areas, with farming terraces and scattered closed structures, where occupation was less recurrent and smaller frequencies of pottery sherds are expected. Finally, the higher number of sherds in the distal sector and/or valley floor also corresponds to persistent pre-Hispanic occupations. The pottery sherds assemblages exhibit traces of horizontal displacement and mixing processes but with only minor effect at a regional scale. In addition, there is relationship between the relative chronology of the surface sherds and those from excavations. We conclude that the spatial patterns established by the pottery sherds are reliable, although with a greater impact of erosion on the frequency of the sherds in the middle part of the piedmont.