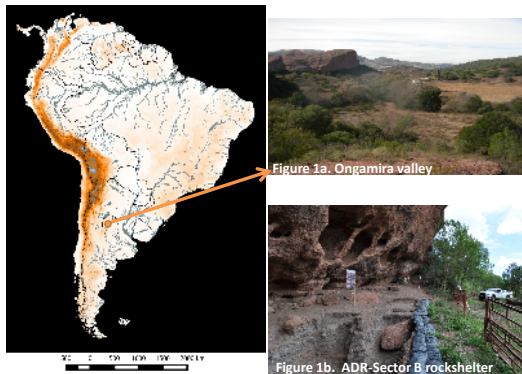


Late Holocene (~3.9kybp-present) environmental conditions through the analysis of microfauna. Upper Ongamira Valley, Northern Córdoba Province, Central Argentina

Julián MIGNINO *, Juan José MARTÍNEZ **, Andrés D. IZETA ***

* Museo de Antropología, Facultad de Filosofía y Humanidades. Universidad Nacional de Córdoba. julianmignino@gmail.com
 ** CONICET y Departamento de Ciencias Naturales, Facultad de Ciencias Exactas, Físico-Químicas y Naturales. Universidad Nacional de Río Cuarto. juan_jmart@yahoo.com.ar
 *** IDACOR-CONICET y Museo de Antropología, Facultad de Filosofía y Humanidades. Universidad Nacional de Córdoba. andresizeta@gmail.com



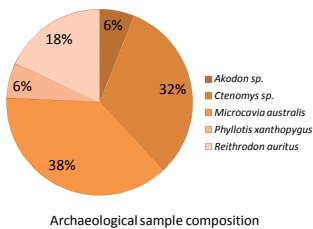
Introduction

The identification of the taxa represented in microvertebrate assemblages has allowed gaining significant information on the environmental conditions upon depositing fossil assemblages (Stahl 1996).

In this research we compare two sets of microvertebrates, both from Alero Deodoro Roca-Sector B, archaeological site (30° 46' 28.94"S, 64° 24' 49.57" W) (Figure 1a, b). On the one hand, we identified an archaeological set of craniomandibular remains from Late Holocene-related strata (MNI = 35), dated 3043 +/- 41 radiocarbon years BP (Cattáneo et al., 2013). On the other hand, we registered an actualistic sample obtained from the systematic collection of raptor pellets (Figure 2, Figure 3) (MNI = 76). From the analysis of archaeological samples we could identify 3 species of sigmodontine rodents: *Phyllotis xanthopygus*, *Reithrodon auritus* and *Akodon cf. A. polopi*; and 2 species of caviomorph rodents: *Microcavia australis* and *Ctenomys sp.* The analysis of current samples allowed identifying 6 species: 3 sigmodontine rodents (*Phyllotis xanthopygus*, *Calomys cf. C. musculus*, *Akodon cf. A. polopi*), 2 species of caviomorph rodents (*Microcavia cf. M. australis*, *Ctenomys sp.*) and a South American marsupial species (*Thyllamys pallidior*).

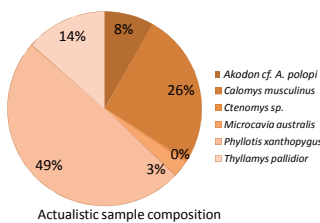
TAXON	NSP	MNI
<i>Akodon sp.</i>	4	3
<i>Ctenomys sp.</i>	21	14
<i>Microcavia australis</i>	25	9
<i>Phyllotis xanthopygus</i>	4	3
<i>Reithrodon auritus</i>	12	6
TOTAL	66	35

Table 1. Quantification of archaeological sample.



TAXON	NSP	MNI
<i>Akodon cf. A. polopi</i>	15	6
<i>Calomys musculus</i>	47	20
<i>Ctenomys sp.</i>	1	1
<i>Microcavia australis</i>	5	3
<i>Phyllotis xanthopygus</i>	91	34
<i>Thyllamys pallidior</i>	25	12
TOTAL	184	76

Table 2. Quantification of actualistic sample.



Materials and Methods

We analyzed a total of 447 specimens (MNI = 35) corresponding to the archaeological sample and a total of 184 specimens (MNI = 76) corresponding to the actualistic sample. The former were recovered via systematic stratigraphic excavations, using tridimensional data for provenience location and recovery through fine sieve (1 mm mesh). The

latter were recovered in ADR within four archaeological expeditions in different seasons. Anatomical and taxonomic identification was carried out on the basis of a comparison with reference literature and modern comparative collections. NISP and MNI were calculated, for this study, on the basis of cranial elements.

The sample was analyzed from a taphonomically-oriented perspective. Accordingly, cranial and postcranial elements were analyzed to find signs revealing the action of digestive acids or traumas caused by predators.



Figure 2. Owl pellets (summer concentration)



Figure 3. Owl pellets (autumn concentration)

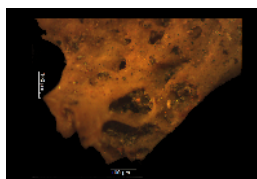


Figure 4.a. ADR 661-CAT 647 (Archaeological sample)

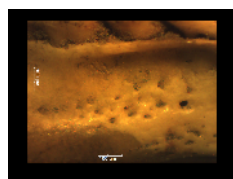


Figure 4.b. ADR 453-CAT 135 (Archaeological sample)

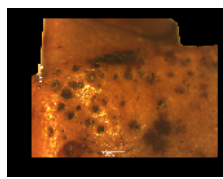


Figure 4.c. ADR 356-CAT 1425 (Archaeological sample)



Figure 4.d. ADR 017 (Actualistic sample)

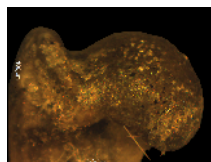


Figure 4.e. ADR 012 (Actualistic sample)



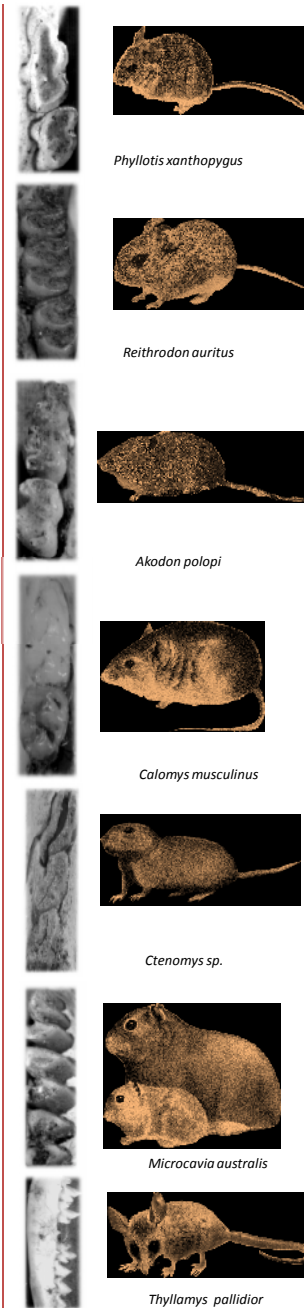
Figure 4.f. ADR 009 (archaeological sample)

Preliminary conclusions

On the basis of diagnostic characters found by microscopic analysis (Figures 4a, b, c, d, e, f), we can infer that in both, current and archaeological assemblages, strigiform birds are the main agents responsible for the accumulation of microvertebrates. The status of the samples has allowed disregarding carnivores and falconiform birds such as possible accumulator agents of fossil material (Montalvo et al., 2013; Ballejo et al., 2012). Moreover, the composition of present-day

pellets does not exhibit selectivity regarding present taxa, implying an overall sampling of those available in the environment (Nores and Gutiérrez, 1990). Comparing current assemblages with those of the sample from archaeological contexts allows us to observe the presence of abundant remains of *Reithrodon auritus*, a characteristic species of cold and dry environments such as Patagonia and the southern province of Córdoba. This preliminary difference in abundance between the two samples

could be related to an environmental change from a cold and dry climate to one warmer and more humid. In general, this agrees with the information recorded by other environmental proxies such as isotopic results from shells of land snails (Yanes et al. 2014) or soil organic matter (Silva et al 2011), together with the geomorphological interpretations of the area (Carignano 1999), which are consistent with the results obtained through the analysis of these microvertebrate assemblages.



References

- *Ballejo, F., Fernández, F., De Santis, L. 2012. Taponomía de restos óseos provenientes de roedores de *Cariacus v. stratus* (lira de cabeza negra) en el noroeste de la Patagonia argentina. *Revista del Museo de Antropología* 5: 213-222.
- *Carignano, C. Late Pleistocene to recent climate change in Córdoba Province, Argentina: Geomorphological evidence. *Quaternary International* 57-58: 117-134
- *Cattáneo, R., Izeta, A., Takigami, M. 2013. Primeros fechados radiocarbónicos para el sector B del sitio Alero Deodoro Roca, Rio Cuarto. *Revista del Museo de Antropología* 6: 559-567
- *Montalvo, C., Biondini, C., Kim, M., Sosa, R. 2013. Taphonomic analysis of rodent bone accumulations produced by Geoffroy's cat (*Leopardus geoffroyi*, Carnivora, Felidae) in Central Argentina. *Journal of Archaeological Science* 39 (2013): 1933-1941
- *Nores, A. L., Gutiérrez, M. (1990) Dieta de la Lechuga de Campanario (Tyto alba) en Córdoba, Argentina. *Hornos* 3(1): 129-132
- *Silva, L., Giorgis, M., Anand, M., Enric, L., Pérez Haggard, M., Falczak, V., Tieszen, L., Cabido, M. 2011. Evidence of shifts in C4 species range in central Argentina during the late Holocene. *Plant And Soil* 349: 261 - 279
- *Stahl, P.W. 1996. The recovery and interpretation of Microvertebrate bone assemblages from archaeological context. *Journal of Archaeological method and theory* 3: 31-75
- *Yanes, Y., Izeta, A., Cattáneo, R., Costa, T., Gordillo, S. 2014. Holocene (4.5-1.7 cal. Yr BP) Paleoenvironmental conditions in central Argentina inferred from entre-shell and intra-shell stable isotope composition of terrestrial gastropods. *The Holocene*. doi:10.1177/0959636144049599.

