

Preservation of fossil bones of small mammals from El Harhoura 2 cave (Morocco, Pleistocene – Holocene)

YANNICKE DAUPHIN¹, AND BASTIEN FARRE^{2*}

¹UMR IDES, Université Paris Sud, France,
yannicke.dauphin@u-psud.fr

²GEGENA2 Université de Reims, Champagne Ardennes,
Bastien.farre@univ-reims.fr (* presenting author)

Introduction. Studying the Hominid installation in Maghreb is an outstanding question due to the fact that early *Homo sapiens sapiens* originated from Africa and some of the earliest remains has been found in North Africa. Numerous archaeological sites have revealed large mammals. However, only few Pleistocene sites from Atlantic Morocco have yielded microvertebrates. Did the 6th extinction start as modern humans settled? Biodiversity is based on the abundance of taxa. However, fossilisation induces substantial preservational bias in the fossil record. Thus, we study the preservation of fossil bones to estimate the impact of fossilisation on past biodiversity (ANR MOHMIE project [1]).

Results and Conclusion

Eleven layers have been identified in the Late Pleistocene - Middle Holocene series [2]. Sands represent more than 80% of the sediment. From SEM observations [2], rodent bones are well preserved, showing the main histological features (Fig.). Secondary deposits are rare. Nevertheless, FTIR analyses have evidenced differences between modern and fossil samples. The primary mineralogy (apatite) is preserved. All fossils show a decrease in CO₃/PO₄ ratio, but no regular trend from the top to the bottom of the excavation. Crystallinity is variable. All bones are strongly depleted in organic matrices, but again no regular trend has been detected through the stratigraphic levels.

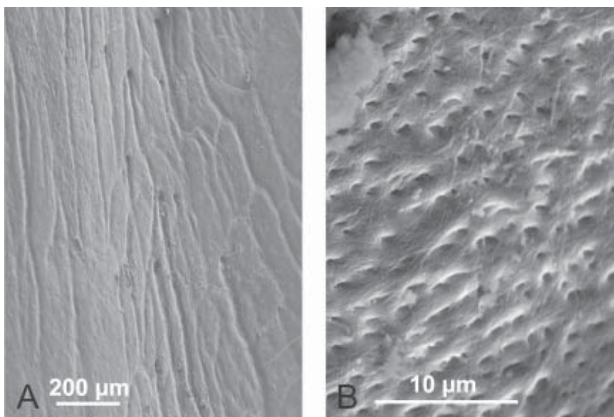


Figure: External surface (A) and fracture (B) of a femur of *Meriones*

Preliminary extractions yield very few quantities of soluble and insoluble organic components, and insoluble extracts contain residual minerals. There is no correlation between the external aspect and the preservation of histology and composition. Additional data are needed to answer the question about biases and changes in biodiversity in this site.

[1] MOHMIE was supported by ANR Grant 2009 PEXT 004 04. [2] Stoetzel *et al.* (2010) *Hist. Biol.* **22**, 303-319. [3] Farre (2011) AIR archéométrie, CNRS, abstract and poster.

The Buffering Nature of Iron Slag in Ironville, Adirondacks, NY, USA—a Preliminary Study

DORI J. FARTHING^{1*}

¹The State University of New York at Geneseo, Geneseo, NY, USA,
farthing@geneseo.edu (* presenting author)

For years, acid rain has been an issue for the Adirondack region of the United States. Extremely low pH values have impacted the hydrosphere and the health of many local ecosystems (e.g., [1, 2]). This preliminary study indicates that, in Ironville, NY, the presence of iron slag might buffer these extreme conditions.

Iron smelting in Ironville, NY took place from 1828 through 1886. Today, all that remains of the operations are the foundations of worker buildings, part of the furnace and a ~362 square meter slag pile. The pile is a loosely consolidated mixture of slag and other debris including bricks and modern tree roots. The slag is highly glassy, variegated in color, and often has a vesicular and ropey appearance. Iron prills are common and are often in an oxidized state. Some samples also contain visible areas of crystalline material. SiO₂, FeO, and CaO predominate the major element chemistry for Ironville slag. Slag is not confined to the pile and can be found littering the ground adjacent to the pile, around the smelter remains, and also in Putnam Creek which borders the pile.

More than 50 soil samples from the slag pile and its vicinity were collected and analyzed on site using a Hellige-Truog Soil pH test kit. GPS data was collected in coordination with each soil sample so that a detailed map could be generated. The soils of the area are typically a fine sandy loam and the analyzed samples came from predominantly the O and A horizons (the upper 13 cm of soil). A pit was dug into the slag pile and soil-like material from the pit was also analyzed for pH. Soils from the pile and adjacent to it have an average pH of 8.0. Even close to the furnace, pH values continue to be mildly basic in nature. Moving beyond the pile, the basic pH persists and even 0.8 km downstream from the pile, pH's of 8 were still found. However, when soil samples were tested approximately 13 Km away, the soil pH dropped down to a value of 2.

[1] Sullivan, et al. (2006) *Soil Science Society of America Journal Vol 70-1* p. 141-152. [2] Lawrence, et al. (2009) *U.S. Geological Survey Fact Sheet 3075*, p 1-6.