A53 Subaerial Bone Weathering in North Africa: An Experimental Study in Algiers, Algeria

Ammar Lahouel, MD, INCC/GN, BP 194 Bouchaoui, Cheraga, 16002, Algiers, ALGERIA; M. Y. Guellati, MD, INCC/GN, BP 194 Bouchaoui, Cheraga, Algiers, ALGERIA; Habdelhamid Grait, MD, Alger, ALGERIA; Moussa Toumi, BA, INCC/GN, BP 194 Bouchaoui, Cheraga, Algiers, ALGERIA; A. Boudaba, MD, INCC/GN, BP 194 Bouchaoui, Cheraga, Algiers, ALGERIA; Brahim Djedouani, BA, INCC/GN, BP 194 Bouchaoui, Cheraga, Algiers, ALGERIA; A. Atrouz, MD, INCC/GN, BP 194 Bouchaoui, Cheraga, Algiers, ALGERIA; A. Djebbouri, BA, INCC/GN, BP 194 Bouchaoui, Cheraga, Algier , ALGERIA; Miles Benalia, BA, INCC/GN, BP 194 Bouchaoui, Cheraga, Algiers, ALGERIA; A. Mezhoudi, BA, INCC/GN, BP 194 Bouchaoui, Cheraga, Algiers, ALGERIA; R. Boussahla, BA, INCC/GN, BP 194 Bouchaoui, Cheraga, Algiers, ALGERIA; A. Slimani, BA, INCC/GN, BP 194 Bouchaoui, Cheraga, Algiers, ALGERIA; Jonathan D. Bethard, PhD*, University of South Florida, Dept of Anthropology, 4202 E Fowler Avenue, SOC 107, Tampa, FL 33620-8100; and Elizabeth A. DiGangi, PhD*, Department of Anthropology, Binghamton University, PO Box 6000, Binghamton, NY 13902*

After attending this presentation, attendees will understand the ways in which subaerial weathering research can enhance estimates of the Postmortem Interval (PMI) in forensic anthropological contexts, particularly in the region of Algiers, Algeria.

This presentation will impact the forensic science community by providing new subaerial weathering data from the Mediterranean region of North Africa, specifically in the region of Algiers, Algeria.

Taphonomy is the study of all of the processes that occur after death until the recovery of an organism and is critical to the reconstruction of forensic anthropological contexts. The study of taphonomic effects on bones, particularly those related to subaerial weathering, sometimes allows for the estimation of the PMI in medicolegal contexts. Scholars have demonstrated that numerous variables, including solar radiation, heat, moisture, and freeze/thaw cycles, affect human skeletal remains over time.[1] Moreover, researchers have developed six Weathering Stages (WS) to describe the degree and extent of osseous changes linked to subaerial weathering.[1] While several studies representing diverse geographic contexts have been undertaken to document subaerial weathering, there have been no studies related to this topic in Algeria, despite the high frequency of forensic casework recovered from outdoor surface contexts there, particularly in urban zones located along the Mediterranean coastline. This study presents WS data generated from an actualistic study conducted in the Algerian capital of Algiers, located in the country's northernmost region along the Mediterranean coast. Algiers is characterized by a mild climate with moderate seasonality (Köppen climate classification (Csa). The mean annual temperature is approximately 18.3°C (65°F) and there is approximately 600mm (24 in) of precipitation annually.

The experiment consisted of depositing fresh, defleshed and fleshed ovine (*Ovis aries)* and bovine (*Bos taurus*) bones on the surface of the grounds of the Institut National de Criminalistique et de Criminologie de la Gendarmerie Nationale Algérienne (INCC/GN) (the National Institute of Criminalistics and Criminology of the National Gendarmerie) in Algiers. All skeletal elements were deposited in June 2014 and observed over a period of two years. Corresponding WS stages were recorded visually and documented with photography.

Regarding the defleshed skeletal elements, WS 0-2 were observed during the two-year observation period. Bones remained in WS 0 for nearly a year, with WS 1 reached after 11 months. WS 2 was reached after 23 months.

These results are similar to other regions of the world where WS 1 and WS 2 have been observed 1-2 years after death. For example, on the African continent, scholars observed WS 1 two years after death in Zaire.[2] WS 2 has been observed beginning after two years in Kenya.[3]

Though these results provide some preliminary data on subaerial weathering in Algiers, this research is ongoing. There are plans to continue this study to better understand when and if WS 3-5 appear. Moreover, this study will hopefully be expanded to the southern region of Algeria to document differences in subaerial weathering caused by exposure to the Sahara Desert. Ultimately, this study will contribute to refining PMI estimates for Algerian forensic anthropological contexts.

Reference(s):

1. Junod CA, Pokines JT. Subaerial Weathering. In: Pokines JT, Symes SA, editors. *Manual of Forensic Taphonomy.* Boca Raton: CRC Press; 2014; 287-314.
2. Coe M. The decomposition of elephant carcasses in the Tsavo (East) National Park, Kenya. *Journal of Arid Environments.* 1978; 1:71-86.
3. Behrensmeyer AK. Taphonomic and ecologic information from bone weathering. *Palaeobiology.* 1978; 4:150-62.

Taphonomy, Subaerial Weathering, Algeria