

The Protocol for the Preparation of Burned Identified Skeletons of the CEI/XXI Collection

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Introduction

Burned identified skeletons from the CEI/XXI Collection [1] are pioneeringly being assembled at the Department of Life Sciences of the University of Coimbra with the objective of adding more information about how the skeleton reacts in contact with heat. The protocol for the preparation of skeletons was designed to enhance this aspect and includes a comprehensive checklist of all the steps involved in the process. Expectantly, this will improve the analysis of burned human remains from virtually any context, ancient or modern.

Protocol

A. Skeleton selection and pre-burning documentation

Skeletons selected for burning must avoid bone lesions, pseudopathologies, unusual morphologies and any abnormalities unless such characteristics are part of a specific research goal.

- The inventory of every bone and teeth is carried out.
- Only bilateral bones are experimentally burned. Therefore, only one antimer is subjected to heat so that an unburned counterpart may be used for comparison in future researches.
- Photos of each bone that will be subjected to burning are taken. All photos contain an identification number and scale;

B. Pre-burned analysis

- Pathological change, trauma, and developing anomalies are recorded;
- All bones are weighted and measured;
- Bone samples are taken for vibrational spectroscopic analyses. Samples are kept in eppendorf tubes and labeled.

C. Burning procedure

Combustion parameters are video recorded to allow the investigation of heat-induced changes in function of:

- Maximum temperature (400°C to 900 °C);
- Duration (75 min to 195 min);

D. Post-Burned Analysis

After the burning process, heat-induced changes in the human skeleton are analyzed by repeating the procedures described in point C.

E. Preservation, Labeling and Storage

In order to preserve, label and store adequately the burned human skeleton, the following steps are carried out:

- Preservative is applied on all bones, with exception of phalanges since future research may require unconsolidated bone samples;
- Each bone is labeled in non-joint surfaces with a smooth area free of lesions.
- Each skeleton is kept in a plastic container which has a sponge layer in its base to protect the bones against abrasion/friction.

UNBURNED				BURNED			
WEIGHT (g)	LEFT	RIGHT	TOTAL	WEIGHT (g)	LEFT	RIGHT	TOTAL
Skull			669,30	Skull			669,30
Mandible			69,27	Mandible			69,27
Hyoid			0,00	Hyoid			0,00
CRANIUM	0,00	0,00	738,57	CRANIUM			738,57
Vertebral Column			222,22	Vertebral Column			222,22
Ribs	76,31	64,94	141,25	Ribs			141,25
Sternum			12,99	Sternum			12,99
TRUNK	76,31	64,94	141,25	TRUNK			141,25
Clavicle	15,35		15,35	Clavicle			15,35
Scapula	45,71	49,07	94,78	Scapula			94,78
Humerus	93,32	104,01	197,33	Humerus			197,33
Radius	29,50	31,95	61,45	Radius			61,45
Ulna	39,41	39,63	79,04	Ulna			79,04
Hand	20,70	25,42	46,12	Hand			46,12
UPPER LIMB	144,05	150,98	295,03	UPPER LIMB			295,03
Hip Bone	128,30	130,31	258,61	Hip Bone			258,61
Femur	276,98	304,16	581,14	Femur			581,14

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