

## The “Mummy of Erba”: A study proposal for the analysis of a mummified Egyptian specimen

*Roberta Fusco<sup>1</sup>, Omar Larentis<sup>1</sup>, Barbara Cermeson<sup>2</sup>, Annamaria Ravagnan<sup>3</sup>, Chiara Tesi<sup>1</sup>*

<sup>1</sup> Centre of Research in Osteoarchaeology and Paleopathology, Department of Biotechnology and Life Sciences, University of Insubria, Varese, Italy; <sup>2</sup> Civic Museum of Erba (Como), Italy; Civic Museums of Varese, Italy; <sup>3</sup> International Council of Museums' Committee for Egyptology (ICOM - CIPEG)

**Abstract.** The so-called “Mummy of Erba” is an Egyptian specimen housed in the Civic Museum of Erba, consisting of three embalmed parts, a head, a left hand and a foot. As intact contexts, mummies allow to conduct comprehensive studies on all the preserved tissues, offering the possibility to analyze them through the non-invasive Radiodiagnostic methods, without proceeding to the unwrapping. The study we present is a proposal to analyze the mummy with a multidisciplinary approach, in order to acquire anthropological, paleopathological, archaeometric and archaeological data on this preserved specimen. Finally, this contribution is aimed at exposing all the provided methodologies with a view to conducting a complete analysis of the sample.

**Key words:** Egypt, mummy, computed tomography, anthropology, paleopathology

Three Egyptian mummified human remains that are exposed in the Civic Museum of Erba (Lombardy, northern Italy), were originally donated by the Marquis Francesco Majnoni d'Intignano who bought them during his stay in Cairo as the General Consul of Italy (1). The specimen consists of a head (Fig. 1), a left hand and a foot (Fig. 2).

The head is in a bad state of preservation in some portions of the cranial cap, the bandages have been destroyed and it has skeletonized, the second and third fingers are missing on the foot, while the conditions of conservation of the hand are good.

On the foot, adherent to the bandages, there are some blue Faience tubes, a particular type of vitreous material, which was part of an ancient funeral net. Nets like this, were used on a mummy to protect it and guarantee its survival forever. This custom appeared in the XXI dynasty but it is attested with particular frequency during the XXVI dynasty and it seems to continue until the Ptolemaic period (2).

In the present state of knowledge, it is difficult to establish if the three mummified anatomical parts belong to the same individual. The mummy was already fragmented and deprived of the body when it arrived in Italy, maybe due to transport needs, to historical events, or the outcome of an embalming that had not perfectly succeeded.

Starting from the early 1900s, following the discovery of a large quantity of mummies it was understood the importance of them for the purposes of medical research (3). Sir A. Ruffer was among the first doctors to analyze samples of mummified soft tissues looking for traces of infectious diseases.

Mummified specimens, by natural or artificial processes, are very significant in the paleopathological field, due to the conservation of most body parts and of the otherwise deperible tissues, enabling complete studies on intact biological contexts. These evidences represent unique examples in the archaeological perspective, because they retain evident and detectable



**Figure 1.** Frontal view of the embalmed head. It is observed the preservation of the upper facial bandages and the uncovering of the cranial cap.



**Figure 2.** Lateral view of the left foot. Blue Faience tubes are visible on the dorsal portion of the wrappings.

traces of the processes to which they had been subjected to. As intact contexts, mummies allow us to conduct comprehensive studies on all the preserved evidence. Numerous research on mummified samples has already been conducted all over the world in the past and

recently, providing a wide scientific literature of comparison for the techniques and methods of study (4, 5).

In this letter, we propose the multidisciplinary analysis of the specimen of the Mummy of Erba.

Here, we expose our purpose to first conduct the radiographic and tomographic studies on these evidences in order to analyze the internal features, obtain 3D reconstructions and detailed images of the covered surfaces and a wide number of subtle slices of the specimen, avoiding the issue of destruction and loss of the evidences, which would otherwise arise due to an invasive process of study (6). Then, our aim is to provide anthropological data of the mummified remains, determining the sex and the age-at-death of the individual and its pathological conditions, proceeding to a generic identification through the reconstruction of the biological profile (7). Detection of pathologies is allowed by the imaging of the bone surfaces and preserved tissues and through the multi-slice tomographic procedure. In summary, the major goal of CT-scan procedures is, as stated by Mininberg (8), the possibility to “unwrap” the mummies without actually unwrapping them.

Interesting for the reconstruction of embalming techniques is the possibility to visualize the cranial cavity, the eventual breakage of ethmoid bone and ex-cerebration marks. Other possible applications of the tomographic unwrapping are also the identification and facial reconstruction through the determination of the shape of the skull (9).

Firstly, an external morphological evaluation of the mummy has been conducted by the authors, in order to provide some information on the conservation status, the pattern of wrappings and the preservation of tissues. Other data concerning the internal cavities and the eventual presence of embalming-related substances, such as fillings in the orbits and the mouth cavity, will be collected after the complete radiographic study.

Histological analysis is useful to assess the preservation status of the sample, the diagenesis processes, the eventual fungal growths and bacterial damage; moreover this analysis is needed to study in depth eventual pathologies of the tissues noticed during the study (10). For a better comprehension of the chronology we propose the  $^{14}\text{C}$  analysis in order to assign the sample a more reliable absolute date.

Finally, we believe that the study we are proposing will allow us to describe, in detail, the remains from Erba, in order to catalogue and insert them into the literature about Egyptian mummified specimens stored in Italian museums and to provide anthropological data on an adjunctive evidence of the ancient process of mummification.

## References

1. Inventario Reperti, Civico Museo di Erba, E 421 Mummia
2. Engelbach R. *Introduction to Egyptian Archaeology*. Cairo: Institut Français d'Archéologie Orientale; 1946.
3. Grilletto R. *Il mistero delle mummie: dall'antichità ai nostri giorni attraverso il tempo e lo spazio*. Roma: Newton & Compton; 2005.
4. Nystrom KC, Tilley L. Mummy studies and the bioarchaeology of care. *Int J Paleopathol* 2018. doi: 10.1016/j.ijpp.2018.06.004.
5. Licata M, Tosi A, Larentis O, Rossetti C, Iorio S, Pinto A. Radiology of Mummies. *Semin Ultrasound CT MR* 2018. doi: org/10.1053/j.sult.2018.10.016.
6. Cesarani F, Martina MC, Ferraris A, Grilletto R, Boano R, Marochetti EF, Donadoni AM, Gandini G. Whole-Body Three-Dimensional Multidetector CT of 13 Egyptian Human Mummies. *AJR Am J Roentgenol* 2003; 80(3): 597-606.
7. Licata M, Borgo M, Armocida G, Nicosia L, Ferioli E. New paleoradiological investigations of ancient human remains from North West Lombardy archaeological excavations. *Skeletal Radiol* 2016; 45(3): 323-31.
8. Mininberg DT. The Museum's Mummies: An Inside View. *Neurosurgery* 2001; 49(1): 8.
9. Cesarani F, Martina MC, Grilletto R, Boano R, Roveri AMD, Capussotto V, Giuliano A, Celia M, Gandini G. Facial Reconstruction of a Wrapped Egyptian Mummy Using MDCT. *Am J Roentgenol* 2004; 183(3):755-8.
10. Giuffra V, Pangoli D, Cosmacini P, Caramella D, Silvano F, Fornaciari G, Ciranni R. Paleopathological evaluation and radiological study of 46 Egyptian mummified specimens in Italian Museums. *Egitto e Vicino Oriente* 2009; 3: 121-55.

---

Correspondence:

Roberta Fusco

Centre of Research in Osteoarchaeology and Paleopathology,

Department of Biotechnology and Life Sciences,

University of Insubria, Varese, Italy

E-mail: roberta-fusco@virgilio.it