

X-rays unravel ancient Egyptian treasures

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An example of the X-Ray Fluorescence imaging applied to the painted casket. Credits: Giulia Festa, Daniela De Martino, Francesco Paolo Romano.

An Italian team of researchers used the analytical techniques to characterize the intact Kha burial assemblage, a unique treasure exhibited at the Egyptian Museum of Turin. The collection is part of objects coming from one of the tombs discovered in 1906 by Ernesto Schiapparelli's Italian archaeological mission. The archaeologists discovered the shaft of an underground tomb, containing the intact burial assemblage of two upper-class individuals, "the director of works" Kha and his wife Merit. It was the richest and most complete non-royal burial assemblage ever discovered. Grave-goods include coffins tunics, beds, vases, cosmetics and prestigious luxury objects inscribed with royal names, which allowed dating his career between the reigns of Amenhotep II and Amenhotep III (1425-1353 BC). The grave-goods of Kha also include alabaster containers, caskets, ceramic vessels and jars for food, oil, powders and precious perfumes, linen textiles and metals.

A multidisciplinary and interdisciplinary team (from the University of Rome Tor Vergata, acting as coordinator, the CNR Istituto per i Beni Archeologici e Monumentali (IBAM) and the CNR Istituto per i Processi Chimico Fisici (IPCF), the Museo Storico della Fisica e Centro Studi e Ricerche Enrico Fermi, the Museo Egizio di Torino and the Soprintendenza Archeologia del Piemonte, the University of Milano-Bicocca and the LANDIS laboratory of INFN-LNS) apply the non-invasive and non-destructive macro scan X-Ray Fluorescence imaging (MA-XRF) and X-Ray Diffraction (XRD) to study the Kha collection. The new scanning methodology, arranged in a mobile set-up for use in museums, provides high-resolution images of the elemental distribution on the investigated artefacts and helps the development of a deeper understanding of the craftsmanship and technology used.

Preliminary results from the XRF scans of the Egyptian painted caskets give precious indications about the painting techniques applied, the presence of different hands and their conservation status, new clues on Egyptian painting techniques and the state of conservation of these ancient objects.