The execration figurines of the Royal Museums of Art and History (RMAH, Brussels) were discovered at Saqqara in the 1920s. The collection comprises over a hundred (fragmentary) figurines and three small rectangular coffins, all made of unfired clay and dating to the late Middle Kingdom. The figurines are covered with execration texts: hieratic inscriptions in red or black, listing names of foreign places, rulers and/or individual enemies. By focusing on the direct neighbors of Egypt—Libya, Nubia and the Levant—as well as on Egyptian enemies, these figurines are often regarded as crucial primary sources for our knowledge of the political geography of the region. Their study is mainly hampered by the poor state of conservation, while a second challenge is the only partial preservation of the ink traces, resulting in a great loss of information.

The figurines were selected as a case study for the Egyptian Execration Statuettes Project of the RMAH. The project is involved in the development of a multispectral, multilight and easily transportable imaging system, the Multispectral Portable Light Dome (MS PLD), in collaboration with the KU Leuven’s Digital Lab and ESAT-VISICS. The MS PLD offers an approach requiring minimal handling of the object while delivering maximal output for research and conservation purposes. The system, originally developed for the documentation of cuneiform tablets, has now been adapted to create multispectral 2D+ images of small, decorated (and often fragile) artifacts. The relief and texture/color values are interactive data based on a recording process using infrared, red, green, blue and ultraviolet light spectra computed with photometric stereo algorithms.

Preliminary tests on a selection of figurines with this system delivered very promising results. The readability of the red inscriptions, representing the vast majority of the texts, was significantly improved, enabling the decipherment of parts of an inscription previously considered to be lost for good. The geometrical characteristics of the figurines can be interactively visualized by the viewer system of the PLD, enabling the study of the manufacturing process and other technical art studies (Fig. 1).

While the main goal of the project is to develop new MS imaging techniques, it also includes a comprehensive analysis of the state of preservation of the objects, essential for the development of these techniques. Furthermore, the chemical composition of the clay and the pigments was determined by handheld X-ray fluorescence, confirming the presence of red ochre pigments and carbon black.

It is generally stated in studies on the multispectral imaging of parchment, papyri and ostraca that black (carbon) inks tend to give the best results in the infrared spectrum, whereas visualizing red ochre inks is often problematic. The MS PLD tests on the clay figurines, however, indicate the contrary. The black ink inscriptions gave very poor responses in the infrared spectrum, thus confirming the new insights that carbon black pigments and clay have nearly the same reflectance response in both visible and infrared spectral bands. Therefore, the contrast between the pigments and the clay is not sufficient to distinguish zones with pigment from those without.

Reaching its final stage of development, the entire collection of the Brussels execration figurines will be documented and the PLD tested on a wider range of materials. Further non-destructive analyses on the materials are also considered. The MS PLD project thus enables a renewed and in-depth study of this valuable collection by Egyptologists, archaeologists and curators.

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Van der Perre et al. 2015 (forthcoming).


For a detailed report on the examination of the pigments, see Van der Perre et al. 2014. The clay analysis will be published in Dennis Braekmans, Vanessa Boschloos, Hendrik Hameeuw and Athena Van der Perre, “Chemical Characterisation of Ancient Egyptian Exegation Figurines through Non-Destructive X-Ray Spectrometry Analysis,” (forthcoming).


Van der Perre et al. 2014.

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**Figure 1**: Verso of figurine E.7608. Interactive images produced by the PLD system reveal different aspects of the surface and topography/relief: a) color-sharpen filter, b) shaded filter, c) normal filter (© RMAH; PLD).