

AperTO - Archivio Istituzionale Open Access dell'Università di Torino

## The colours of the “Coptic” textiles at the “Museo Egizio di Torino

### **This is the author's manuscript**

*Original Citation:*

*Availability:*

This version is available <http://hdl.handle.net/2318/1720682> since 2019-12-27T21:49:46Z

*Publisher:*

Società Chimica Italiana

*Terms of use:*

Open Access

Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)

## **THE COLOURS OF THE “COPTIC” TEXTILES AT THE MUSEO EGIZIO DI TORINO**

M. Gulmini<sup>1</sup>, A. Idone<sup>1</sup>, P. Davit<sup>1</sup>, E. Diana<sup>1</sup>, F. Natale<sup>1</sup>, F. Dal Bello<sup>2</sup>, M. Borla<sup>3</sup>, C. Greco<sup>4</sup>, M. Aceto<sup>5</sup>

<sup>1</sup>Dipartimento di Chimica, Università degli Studi di Torino, Via Giuria, 7 – 10125 Torino

<sup>2</sup> Dipartimento di Biotecnologie Molecolari e Scienze per la Salute, Università degli Studi di Torino, Via Nizza, 52 – 10125 Torino

<sup>3</sup> Soprintendenza Archeologia del Piemonte, Piazza S. Giovanni, 2 - 10122 Torino

<sup>4</sup> Museo Egizio di Torino, Via Accademia delle Scienze, 6 - 10123 Torino

<sup>5</sup> Dipartimento di Scienze e Innovazione Tecnologica, Università del Piemonte Orientale, Viale Teresa Michel, 11 - 15121 Alessandria & Centro Interdisciplinare per lo Studio e la Conservazione dei Beni Culturali (CenISCO), Università degli Studi del Piemonte Orientale, via Manzoni, 8 - 13100 Vercelli

The “Coptic” textile collection of the Museo Egizio di Torino consists of about 250 textiles. Many of them are fragments of coloured decorations and the information related to age and specific provenance is partially or totally missing. The whole collection has been subjected to a systematic multidisciplinary scientific investigation. Dyes were also investigated to complement the set of technological information available for each textile. Different analytical approaches were employed in order to reach different levels of information on the dyes and on dyeing techniques.

A preliminary non-invasive screening by fibre optics diffuse reflectance spectroscopy and portable fluorimetry was performed, and enabled the clustering of the textiles according to red and purple dyes (dyes from scale insects, from madder root or from sea snails were employed).

High performance liquid chromatography couple with diode array and mass spectrometry was then employed for selected textiles to go deeper into the dyeing materials, and enabled the detection of lac dye as the scale insect dye and of weld as the yellow colouring material.

The combined contribution of the non-invasive and micro-invasive analytical investigations revealed a peculiar dyeing procedure, where madder and lac dye were employed to obtain the final colour. Moreover, the whole set of analytical data was compared with dyeing materials found in other “Coptic” textiles dated with radiometric techniques, in order to possibly link the dyes with specific periods of production.

As a further aspect, a micro-invasive procedure by non-extractive surface enhanced Raman spectroscopy on silver colloidal pastes was set up on reference samples and then successfully applied for detecting weld in fibres sampled from the Coptic textiles.