

Tracking Old and New Colours: Material Study of 16th Century Mural Paintings from Evora Cathedral (Southern Portugal)

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Abstract: This article describes the results of a multi-analytical research carried out on the mural paintings from Evora Cathedral, one of the oldest and most prominent monuments of Evora city. The paintings were a late 16th Century addition to the cathedral's northern transept chapel and are attributed to the painter José de Escovar, whose painting workshop was remarkably active in the so-called golden age of mural paintings in southern Portugal. The aim of the study was to reconstruct the paintings' life story through a materials science perspective by discerning the material characteristics of the original and overpaint campaigns. The analytical setup comprised technical photography (TP) in the visible and UV light, Vis Spectrophotometry, optical microscopy (OM) complemented with scanning electron microscopy with energy dispersive X-ray spectrometry (SEM-EDS), micro Fourier transform infrared spectrometry (μ FT-IR) and pyrolysis-gas chromatography (Py-GC/MS) analyses of the collected samples. Results show that the original paint layers were executed with a combination of fresco and secco techniques, using a very simple chromatic palette composed of earth pigments, mercury sulphide, cal-

cium carbonate and green copper based pigments. The paintings were heavily retouched and overpainted using earth pigments, smalt, Prussian blue, zinc white and lead white. Furthermore, the analyses of the cross sections taken from the stuccoed frames revealed a first decorative campaign made with gold and silver alloy. © 2016 Wiley Periodicals, Inc. *Col Res Appl* 41, 276–282, 2016; Published Online 3 February 2016 in Wiley Online Library (wileyonlinelibrary.com). DOI 10.1002/col.22040

Key words: pigments; overpaint; technical photography; Vis spectrometry; SEM-EDS

INTRODUCTION

Evora Cathedral (also known as Sé de Evora) is a Romanesque-Gothic church arranged in a Latin cross floor plan. Its first phase of construction dates to the period between the late 12th and early 13th centuries (Fig. 1).^{1,2} Lying on the highest point of the city, the cathedral was (and still is) one of the most important and frequented monuments of the city of Evora, which was declared a World Heritage Site by Unesco in 1988.

Over the centuries, the monument underwent several building and renovation campaigns, and it is believed that the paintings in question were executed circa 1597 under the patronage of Archbishop D. Teotónio de Bragança.³ These paintings, which depict the life and martyrdom of St. Lawrence, cover the entire vaulted ceiling of the northern transept chapel that measures 3.36 m × 3.16 m and 6 m in height (Fig. 1). The composition is divided into five scenes that are surrounded by painted stuccos with putti frames (Fig. 1). The work is attributed to the

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