

# **A MULTIDISCIPLINARY APPROACH TO THE STUDY OF ARCHAEOLOGICAL MORTARS FROM THE TOWN OF AMMAIA IN THE ROMAN PROVINCE OF LUSITANIA (PORTUGAL)\***

**I. CARDOSO**

*Universidade de Évora, Laboratório HERCULES, Évora, Portugal*

**M. F. MACEDO**

*Universidade Nova de Lisboa, Faculdade de Ciências e Tecnologia, Departamento de Conservação e Restauro,  
VICARTE, Monte da Caparica, Portugal*

**F. VERMEULEN and C. CORSI**

*Universidade de Évora, CIDEHUS—Centro Interdisciplinar de História, Culturas e Sociedades da Universidade de Évora,  
Évora, Portugal*

**A. SANTOS SILVA**

*Laboratório Nacional de Engenharia Civil, Departamento de Materiais, Lisboa, Portugal*

**L. ROSADO and A. CANDEIAS**

*HERCULES Lab and Centro de Química de Évora, Évora, Portugal*

**and J. MIRAÓ†**

*HERCULES Lab and Centro de Geofísica de Évora, Évora, Portugal*

## **ABSTRACT**

*The Roman town of Ammaia (in Marvão Region) is considered one of the most important recent findings of the Roman presence in Portuguese territory. It was settled in Republican times and abandoned in the seventh century. In this research, 17 masonry mortars and renders from the West Tower (South Gate), the residential area near the West Tower, the macellum, the peristylum, the public bath building, the podium of the temple and the portico of the forum were analysed. The methodology of chemical, mineralogical and microstructural characterization has involved several complementary techniques, including stereomicroscopy, X-ray diffraction, thermal analysis and scanning electron microscopy coupled with energy dispersive X-ray spectroscopy. The results indicate that the mortars from the beginning of the town's edification were mainly composed of soil (clays). Later, during the main Roman building period, mortars were composed using a calcitic binder and the mortar composition varied according to their use and function. The samples from a period subsequent to the Roman occupation are based on a dolomitic binder. From the present study, relevant information has been acquired about the technological evolution of Roman construction in Ammaia, the historical context of the archaeological structures and guidelines for the conservation and restoration of mortars.*

**KEYWORDS:** AMMAIA, ROMAN MORTAR, LUSITANIA, CONSERVATION, XRD, TGA, SEM-EDS