

# Chemical, mineralogical and microstructural characterization of historical mortars from the Roman *villa* of Pisões, Beja, Portugal

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**Abstract** In southern Portugal over one hundred Roman villae have been identified; such villae are examples of typical Roman rural construction and have led to the characterisation of a particular type of territorial occupation of Roman society. This paper presents the results of the physio-chemical characterization of the Roman mortars sourced from the archaeological site of the villa of Pisões (I-IV century A.D.), 6 km south of Beja (Alentejo), approximately 230 km southeast of Lisbon. Several samples were extracted from various locations within the villa, including the residential area, with its well preserved mosaics, and the thermal baths, which are indicative of the importance of this rural structure. Full chemical-mineralogical characterisation was carried out and the investigations led to the conclusion that the mortars were composed of aerial calcitic lime with quartz, schistose and granitoid aggregates (extracted from local quarries) and artificial pozzolanic materials (brick powder and fragments). The survival of these mortars, for more than eighteen centuries, is a testament to the careful selection of the materials that ensured their strength and durability.