

A multidisciplinary diagnostic approach for the restoration of the inside surfaces decorative plaster of the vault of the late seventeenth-century of Sant'Angelo Church in Monopoli (Bari, Italy)

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The metropolitan church of Sant'Angelo (Monopoli, Bari - Italy), rebuilt in 1675 on the pre-existing medieval church, shows numerous forms of decay; the church is decorated with stuccoes and painted plaster dating back to the first half of the eighteenth century.

The liturgical space has been heavily altered by extensive biological formations and sulfation that covered decorations, and by surface gaps, due to copious infiltration of rainwater caused by the absence of maintenance of the church since 1920 and also the deprivation of the roof since 1972.

The diagnostic of degradation was supported by mineralogical, petrographic, chemical, and biological investigations performed with optical UV/VIS and electron microscopy, visible spectrometry.

Biological samples, scraped and collected from the church vault, were duplicated and isolated by spread plating on plate count agar medium. The total DNA was extracted and the PCR products were sequenced and DNA similarity check was performed using the Gene Bank and EMBL databases.

The various specialist analyses foreseen in the diagnostic project, preliminary to the restoration intervention, have highlighted important correlations between the technologies and the materials used in the re-editions and formal enrichments, datable between the end of the eighteenth century and the first half of the nineteenth century, as well as the disasters suffered over time, remedial actions and the long phase of abandonment of the church starting from the Second World War.

Finally, the use of infrared thermography and the detection of the decorative apparatus with a 1:5 scale 3D laser scanner, accompanied by monitoring the physical and microclimatic conditions of the environment, helped to define in detail the structural criticalities connected to the interface between the wall structure and the decorative apparatus for timely restoration. Scanning electron microscopy evidenced the presence of fungal and bacterial colonies whose characterization is currently in progress.