

THE “*THERMAE ROMANAE*” OF REGGIO CALABRIA (SOUTH ITALY): AN OPEN AIR LABORATORY FOR TESTING NEW CONSERVATIVE STRATEGIES

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Presentation preference: Oral

Topic: Materials

The *Thermae Romanae* are located on the Reggio Calabria coast (Calabria, Italy) and were founded between the I and II century B.C. This archaeological area represents one of the greatest evidence of Roman architecture in South Italy and it includes ancient imperial ruins of thermal sources. The imperial bath complex was built around three principal rooms: the *calidarium* (hot bath), the *tepidarium* (warm bath) and the *frigidarium* (cold bath), which were connected through different entrances to a central room. The latter is decorated by a suggestive Roman floor mosaic in geometric design, with black and white tesserae, dating between the II and III century A.D.

Unfortunately, the floor mosaic is seriously affected by biological colonization producing a superficial patina that damaged the tesserae. The state of conservation suggested the necessity of a focused and innovative intervention able to protect the mosaic and to reduce the maintenance works over the time. For this reason, new generation products constituted by nanoTiO₂ and Ag were tested thanks their self-cleaning and antimicrobial features.

The more suitable experimental strategy was selected on the basis of the biodeterioration phenomena and the tesserae composition. The new formulates were evaluated preliminarily in the laboratory in terms of stability parameters (e.g. chromatic variations and antimicrobial capability), hydrophobic and self-cleaning features.

In the subsequent and main phase, the experimentation was carried out in the archaeological area. In particular, the nanoproducts were applied on samples of marble plates, coherently with the most common composition of the white mosaic tesserae. The formulates were monitored monthly for six months by means of colorimetric measurements to detect probable chromatic variations and biological samplings to check the antimicrobial effect of the nanoparticles.

This research is funded by POR Calabria FESR project “NANOPROTECH” (NANO PROtection TEchnology for Cultural Heritage).

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