

Biodeterioration of the Peperino Pulpit of the Basilica of San Francesco della Rocca in Viterbo, Italy (XV century).

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Stones used for built heritage are frequently characterized by a strong link with the geology of the surrounding territory. Peperino stone is a dark porous stone used by Central Italy populations since the Palaeolithic age, later by Etruscans and Romans, then during the Middle Age, and the Renaissance till the present day. Despite its wide use for centuries, the studies on peperino biodeteriogens are limited mainly to lichens.

Within the project COLLINE (Regione Lazio, DTC Lazio), focused on the Basilica of San Francesco della Rocca pulpit, the microbial diversity has been assessed before testing the efficacy of low-impact cleaning methods and nanomaterials. Samplings were performed from the Southern and Northern façade at three different heights from the ground using the adhesive tape technique and sterile swabs, to evaluate the biodeteriogens distribution regarding the environmental factors. Direct observation, culture methods and molecular identification of the isolates have been applied with particular attention to black meristematic fungi, well known for their detrimental potential and tolerance to biocides. The results evidenced a strong influence of direct irradiation and water availability in the balance and distribution of phototrophs and fungi. Molecular analyses evidenced the presence of known black fungal species such as *Knufia marmoricola*, already isolated from marble and limestone monuments, and a few possible new taxa.

Keywords: algae, black fungi, cyanobacteria, microbial ecology, rock- inhabiting fungi