"SIMULATED ARTEFACTS" IN BIODETERIORATION STUDIES: COMPARISON BETWEEN THE USE OF NATURAL EXTRACTS AND SYNTHESIZED MATERIALS AS ANTIFUNGAL AGENTS

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The biodeterioration represents a major problem for scientist and museum curators. Some species (Aspergillus, Penicillium) are found on all objects and in the air worldwide. This supports the theory of a common origin of the fungi contaminating heritage objects: airborne conidia either during their fabrication or during their use. From all the artefacts, paper artefacts are more exposed to fungal attack, because their content in starch, glue, vegetable proteins, dyestuffs, pigments, and other additives that could provide nutrients. The continuous need for new treatments for biodeterioration leads to extensive use of real artifacts, in order to prove the efficiency of the proposed treatments. This is the reason we propose a method to avoid the over use of the real artefacts, by using "simulated artefacts". The simulated artefacts represent pieces of cardboard kept for six months in dark and humid environment, exposed to environmental fungi. As comparison, we used several fungi-infested books (some more than one hundred years old). The fungi grown on the "simulated artefacts" were compared to the samples collected from the previously mentioned paper artefacts (books) and proved to be involved the same fungal species (Aspergillus, Penicillium and Mucor).

From the proposed recipes (natural extracts and synthesized materials) we selected the most promising ones for comparison of their antifungal effect, on the separate use and on their combined use. Those are lavender and ramsons extracts obtained in 1:1 ethanol: water solution, respectively hydroxyapatite (HAP) and strontium totally substituted hydroxyapatite (SrHAP). These materials presented over 70% antifungal efficiency. The antifungal efficiency was evaluated using the technique of the diluted inoculum on the surface of culture media. The best results were obtained for the combined use of strontium substituted hydroxyapatite/lavender hydro-alcoholic extract.

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