



**Title: BIOPROSPECTING FILAMENTOUS FUNGI ASSOCIATED WITH DETERIORATION OF MONUMENTS IN SOAPSTONE.**

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**Abstract:**

The natural wear of all kinds of materials occurs due to the transfer of chemicals through biological action, despite being a positive process related to the environmental equilibrium, it is negative when it occurs in materials where one wishes to preserve. Thus, the biodeterioration consists of an undesirable change in properties of a material, which is caused by the metabolic activity of an organism involved in transferring chemicals during the biogeochemical cycles. So the biodeterioration does occur in isolation, relying on the interaction of environmental conditions, the nature of the material used and the micro-organisms. This work aims to identify the filamentous fungi involved in this harmful process on the rocks in soapstone, and propose measures to minimize its deteriorating effect on historical monuments with the same composition of stone. For this, samples of soapstone were collected with a sterile bistoury and then a serial dilution of between  $10^{-1}$  and  $10^{-5}$  in saline solution 0,85%, supplemented with Tween 80 0,001% were plated on Czapek Dox Agar by spread plate method, and incubated for 14 days at 27°C. Fungal colonies were isolated and identified on micro-cultivation through inoculation on Potato Dextrose Agar and visualization with light microscopy. The identification of the fungi was confirmed by sequencing of the region ITS1 and ITS2 by DNA extraction and amplification of the polymerase chain reaction using primers ITS1 and ITS4. The results showed the correlation between the analysis of cultivation and by molecular analysis, especially with the dominance of some species and genera associated with biodeterioration process, such

as *Alternaria* sp., *Cladosporium cladosporioides*, *Curvularia lunata*, *Paecilomyces* sp., *Purpureocillium lilacinum* and *Spondylocladiella botrytioides*. The dominant two species, *P. lilacinum* and *C. cladosporioides*, are related to their high abundance observed in the culture in a Petri dish, which ecological parameter reflects the impossibility of other species to develop on the stone surface. In addition, studies indicate that species of *C. cladosporioides* is associated with the production of organic acids that damage the surface of the stones accelerating the biodeterioration process.

**Keywords:** Biodeterioration, filamentous fungi, soapstone

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