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MONITORING CULTURAL HERITAGE CONSERVATION ENVIRONMENTS: A CASE STUDY AT THE 'COLLEZIONI DI STUDIO' MUSEUM REPOSITORY

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In the fast-moving climate change landscape, museums' mission to ensure long-term conservation and continued access to cultural heritage appears increasingly at risk. Most museums preserve more than half of their collections in storage rooms [1], fundamental but often disregarded environments, facing challenges in terms of preventive conservation. Repositories' objects are characterized by multi-materiality resulting in complex management choices, from preventive to conservation measures, for which defining new protocols is essential. This project aims to develop an in-depth multidisciplinary case study on scientific instruments collections preserved in the repository "Collezioni di Studio" of Museo Nazionale Scienza e Tecnologia Leonardo da Vinci, Milan. It focuses on a one-year environmental monitoring campaign structured on the acquisition of microclimatic data and the concentration and distribution of abiotic and biotic pollutants, respectively obtained by dataloggers and aerobiological analysis. A chemical, physical and microbiological environmental risk model is defined by comparing the atmospheric parameters from previous years to date [2]. Environmental investigations include seasonal air flows analysis for the purpose of verifying the contaminants' deposition rate on multi-material collections, among which metal is the most common material. The assessment of the onset of alterations on metal objects due to environmental exposure is carried out by placing carbon steel control samples monitored over time, with no degradation evidence one year on. Biodeterioration dynamics on multi-material objects are evaluated through non-invasive surface microbiological investigations, with the aim of identifying microbial presence and activity. The study points out that structural and functional characteristics of depot's area impact on both thermo-hygrometric and PM2.5 and VOC parameters, highlighting unstable environmental baselines. The study is framed within the wider context of the ecological transition, addressing the emerging challenges and responsibilities that contemporary conservation practices must navigate in response to dynamic environmental conditions.

References

- [1] ICOM, Working Group on Collections in Storage, Paris, **2024**, Museum Storage around the World.
- [2] E., Schito, D. Testi, **2017**. Integrated maps of risk assessment and minimization of multiple risks for artworks in museum environments based on microclimate control. *Building and Environment*, 123, 585–600. <https://doi.org/10.1016/j.buildenv.2017.07.039>