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Preventive investigations for microclimatic and aerobiological sampling in a museum with climate control and a nearby confined environment without climate control, both underground

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ABSTRACT

Controlling the microclimatic and the aerobiological conditions has a relevant importance for the conservation of cultural heritage in the museum environment. The interaction between microclimate and works of art is complex and depends on several parameters. The values and the variation of these parameters influence the degradation process of the stored materials. In addition, the quality and quantity of airborne biological particles present in the confined environment play an important role in the definition of the potential degree of deterioration of materials.

The Museum of Central Institute of Book Pathology is located in the underground level of the main building of the Institute, in a restored former cellar. In this particular location humidity exchange between the building walls and the internal atmosphere strongly influences the internal microclimate even if the museum environment is controlled in temperature. The situation is further complicated by the presence of nearby environments presently used as storage rooms without climate control, which also represent another potential source of biological contamination.

The preventive investigation has been designed according to the recommendations UNI10829 (Italian Institution for Unification) for the measurement and analysis of ambient conditions for the conservation. In a preliminary phase a short evaluation of the microclimate condition has been performed. Then, on the basis of the previous results, a continuous monitoring system has been set up by using temperature and relative humidity electronic recorder evenly distributed in the museum and in the adjacent storage rooms. Moreover, a hot wire anemometer has been used to measure the air motion in specific sites of the museum. Aerobiological particles have been monitored by gravitational deposition technique and by SAS (Surface Air System) .

Continuous monitoring system has been programmed to acquire data on a yearly base to point out seasonal changes and to better understand the microclimatic and the aerobiological conditions of the museum. Preliminary results indicate the presence of humidity gradient caused by geographic exposition and presence of nearby storage rooms while the temperature conditions are quite stable.

¹ L. Teodonio has collaborated to the research project during his stage at the Istituto Centrale per la Patologia del Libro.