

#### Wilanów Palace Museum

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## → Microbiology in the museum



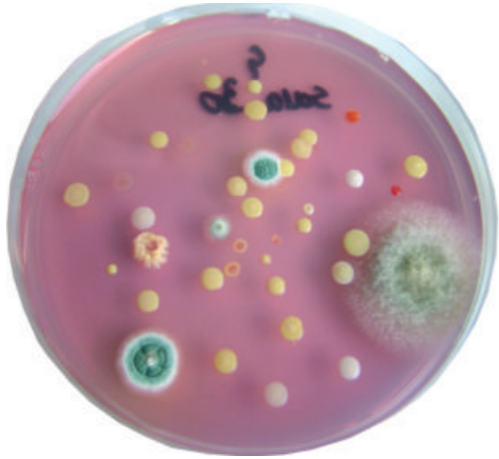
Art of Conservation - Wilanów Palace Museum



# → Microbiology in the museum

**Can objects in a museum become sick? Are invisible microbes a threat to historical objects as well? Microbiology is becoming an increasingly important tool in the protection of museum collections. The phenomenon of microbiological destruction is not a new concept, but it is only recently that new laboratory techniques, as well as microbiological and molecular tests and modern microscopes have given the science a new importance and a growing role in the protection of museum art collections.**

At the Museum Palace of Wilanów the air in the historical chambers of the royal residence is regularly monitored for microbiological content. The data are used to study the dependence between the number of visitors and levels of microbes in the air, including bacteria and the ubiquitous and dangerous microscopic fungi, commonly referred to as mold.



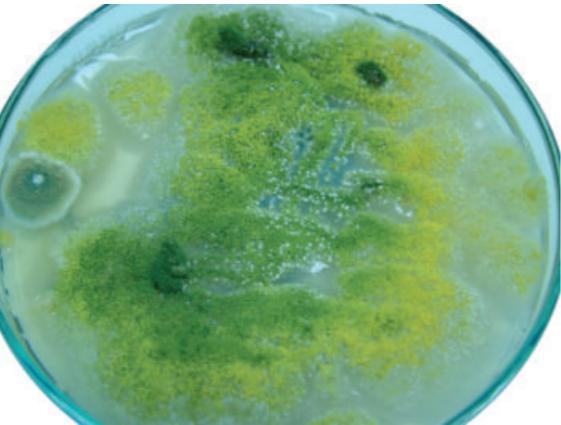
Regular specialist tests of the museum environment are conducted in search of microorganisms, looking for the two kinds of bacteria that constitute a major threat: proteolytic bacteria decomposing albumin in objects made of silk, parchment and wool and cellulolytic bacteria with capacity to destroy objects made of cellulose, such as prints, pastels and books.

Modern equipment used to examine the air for microbes directs an air current straight at a microbiological substratum, which is subsequently kept in a laboratory environment for two to five days before examining the resultant bacterial culture. Isolated bacteria cells cannot be seen without special microscopes, but it is possible to observe with the naked eye colonies of bacteria of different size and shape grown on microbiological substrata. A bacterial colony is a visible concentration of many cells resulting from the division of a single bacteria cell from the sample that fell on a substratum. Filial cells are genetically identical with the matrix. Cell division frequency for different bacteria varies from a few minutes to many

hours, depending on the species and on the conditions in a given environment.

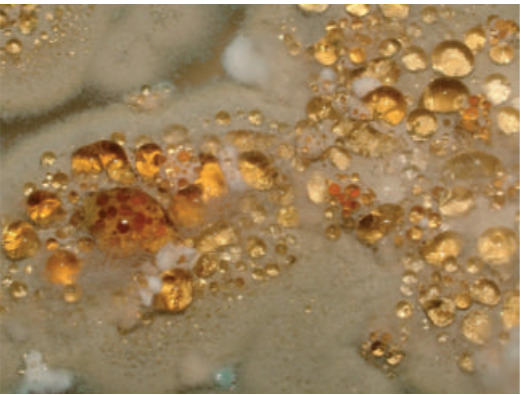


Apart from being of different shape and color, bacterial colonies may also change the color of the substratum around the growth site.



Hyphal fungi, commonly known as mold, are also grown from samples of the environment in museum interiors. These fungi are a real threat to museum collections and can lead to extensive damage of contaminated objects.

To reduce effectively the risk of damage and destruction to objects due to biological and chemical



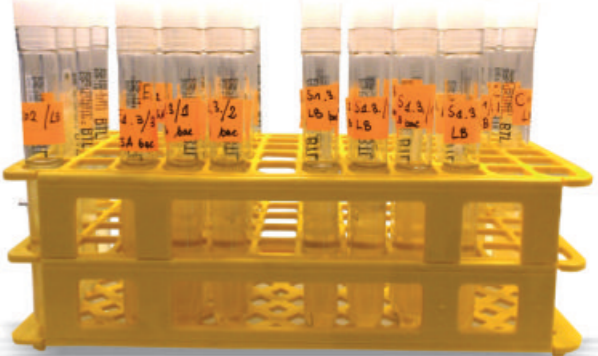
factors, as well as physical ones, most museums around the world attach great importance to controlling interior environment parameters. Temperature (T) is kept at 16–20°C and relative humidity (RH) at 45–55%. These margins take into account the most appropriate physical conditions for displaying historical objects, but they also ensure an environment in which microorganisms threatening the condition of historical objects are the least likely to grow.



Shoe protection devices and requiring outerwear garments to be deposited in cloakrooms are customary in museums. Increasingly often visitors have to pass through a series of air curtains, which are designed to remove dust particles from clothes and stabilize the physical air parameters in museum interiors. Potted plants are removed from museum space, as are carpets, both of which

can become a source of dangerous microorganisms. The number of visitors in an exhibition space at any given time is regulated and sightseeing routes are organized to ensure visitor flow and to limit the possibility of large groups staying too long in restricted spaces. This is essential because large

groups of visitors carry with them considerable amounts of dust particles and raise levels of humidity, temperature and carbon dioxide emission, all of which constitutes an excellent medium for microorganisms.



There are still no uniform indications regarding safe — for visitors and objects — levels of microorganisms in the air of museum and archive interiors. Controlling and regular monitoring of the air environment is therefore of utmost importance, along with regular examination of contaminated objects and air. Improper care could result directly in damage and destruction to often invaluable collections. The prime objective of museum conservators and associated scientists is to keep the objects in the best possible condition, while opening the collections to the general public. Modern science coupled with good museum practice allows safe implementation of this mission.

