

Environmental Microbiology and Cultural Heritage

Biodeterioration of Cultural Heritage: assessment, control, and characterization of microbial communities

Need or problem that solves

Cultural Heritage properties are immersed in an environment in which microorganisms constitute an important set of threats for its conservation. Research and diagnosis are applied to all type of materials. The use of non-invasive techniques allows:

- To know the composition of microbial communities, both in assets and in the environment (for example, air).
- To assess the role of microbial communities as possible threats for conservation and the potential biodeterioration capacity.
- To survey and control the state of conservation of Cultural Heritage assets.

The Environmental Microbiology and Cultural Heritage group (IRNAS–CSIC) is specialized in the study of:

- caves with rock art paintings, tombs, necropolis, and other subterranean sites
- mural paintings in churches and cathedrals, altarpieces,
- biodeterioration of all kinds of materials,
- effects of air pollution on materials, etc.

Innovative aspects

The study of the biodeterioration of Cultural Heritage is approached with a multidisciplinary methodology, which includes among other disciplines:

- ✓ Environmental Microbiology
- ✓ Molecular Biology
- ✓ Bioinformatics
- ✓ Metagenomics
- ✓ Aerobiology
- ✓ Organic and Environmental Chemistry
- ✓ Biogeochemistry
- ✓ Digital image analysis.



Equipment

Our laboratories are equipped to carry out all kinds of microbiological, molecular, metagenomic and bioinformatic analyses. Likewise, the equipment needed for studies on environmental and organic chemistry are available.

Contact

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KEYWORDS

- Biodeterioration
- Conservation
- Diagnosis

POTENTIAL END USERS

Companies and institutions involved in the restoration and conservation of cultural heritage, museums, instrumentation companies and others.

TECNIQUES

- Isolation, culture and identification of bacteria, fungi and algae
- Cloning, sequencing of 16S, 18S, ITS genes and identification of microorganisms
- High-throughput sequencing
- Bioinformatics
- Identification of fatty acid profiles in microorganisms
- Pyrolysis-methylation gas chromatography-mass spectrometry
- Digital image analysis

