

Analyzing chemical changes in verdigris pictorial specimens upon bacteria and fungi biodeterioration using voltammetry of microparticles. ^[1]

Submitted by [Annette Suleika Ortiz Miranda](#) ^[2] on 23 May 2020 - 8:47pm



^[2]

Title	Analyzing chemical changes in verdigris pictorial specimens upon bacteria and fungi biodeterioration using voltammetry of microparticles.
Publication Type	Journal Article
Year of Publication	2017
Authors	Ortiz-Miranda, AS ^[3]
Secondary Authors	Doménech-Carbó, A ^[4]
Tertiary Authors	Doménech-Carbó, MT ^[5]
Subsidiary Authors	L. Cortina, O ^[6]
Journal	Heritage Science
Volume	5
Issue	8
Start Page	1
Type of Article	Research article

Other Numbers <https://rdcu.be/b4mR0>

Keywords [Biodeterioration](#) [7], [Cadmium sulfide](#) [8], [Egg tempera](#) [9], [Egg-oil emulsion](#) [10], [Electrochemistry](#) [11], [Verdigris](#) [12]

Abstract It is reported the application of the voltammetry of microparticles (VMP), complemented with attenuated total reflectance Fourier transform infrared spectroscopy (ATR-FTIR) and field emission scanning electron microscopy (FESEM) techniques, to monitor the deterioration of verdigris pictorial specimens under the action of different biological agents. This methodology would be of application for identifying the type of biological agent causing deterioration of paintings, which is an important problem affecting cultural heritage. The analysis of biodeterioration processes is complicated by the fact that the action of microorganisms can affect both pigment and binding media. The deterioration of pictorial specimens combining verdigris with egg and egg–linseed oil binders by *Penicillium chrysogenum*, *Aspergillus niger*, *Acremonium chrysogenum*, *Trichoderma pseudokoningi* and *Mucor rouxii* fungi and *Bacillus amyloliquefaciens*, *Arthrobacter oxydans* and *Streptomyces cellulofans* bacteria were tested using sample-modified graphite electrodes immersed into aqueous electrolytes. A model is presented to describe the involved electrochemistry resulting in specific voltammetric features for the electrochemical reduction of verdigris associated to the proteinaceous and lipidic fractions of the binders. The experimental results and model proposed have been discussed and compared with those previously obtained for cadmium yellow reconstructed paint film specimens.

DOI [10.1186/s40494-017-0121-x](https://doi.org/10.1186/s40494-017-0121-x) [13]

Copyright © 2006-Present CienciaPR and CAPRI, except where otherwise indicated, all rights reserved

[Privacy](#) | [Terms](#) | [Community Norms](#) | [About CienciaPR](#) | [Contact Us](#)

Source URL: <https://www.cienciapr.org/en/analyzing-chemical-changes-verdigris-pictorial-specimens-upon-bacteria-and-fungi-biodeterioration>

Links

[1] <https://www.cienciapr.org/en/analyzing-chemical-changes-verdigris-pictorial-specimens-upon-bacteria-and-fungi-biodeterioration> [2] <https://www.cienciapr.org/en/user/annettesuleika> [3] <https://www.cienciapr.org/en/biblio?f%5Bauthor%5D=11303> [4] <https://www.cienciapr.org/en/biblio?f%5Bauthor%5D=11300> [5] <https://www.cienciapr.org/en/biblio?f%5Bauthor%5D=11301> [6] <https://www.cienciapr.org/en/biblio?f%5Bauthor%5D=11304> [7] <https://www.cienciapr.org/en/biblio?f%5Bkeyword%5D=6602> [8] <https://www.cienciapr.org/en/biblio?f%5Bkeyword%5D=6604> [9] <https://www.cienciapr.org/en/biblio?f%5Bkeyword%5D=6605> [10] <https://www.cienciapr.org/en/biblio?f%5Bkeyword%5D=6606> [11] <https://www.cienciapr.org/en/biblio?f%5Bkeyword%5D=3490> [12]

<https://www.cienciapr.org/en/biblio?f%5Bkeyword%5D=6603> [13] <http://dx.doi.org/10.1186/s40494-017-0121-x>