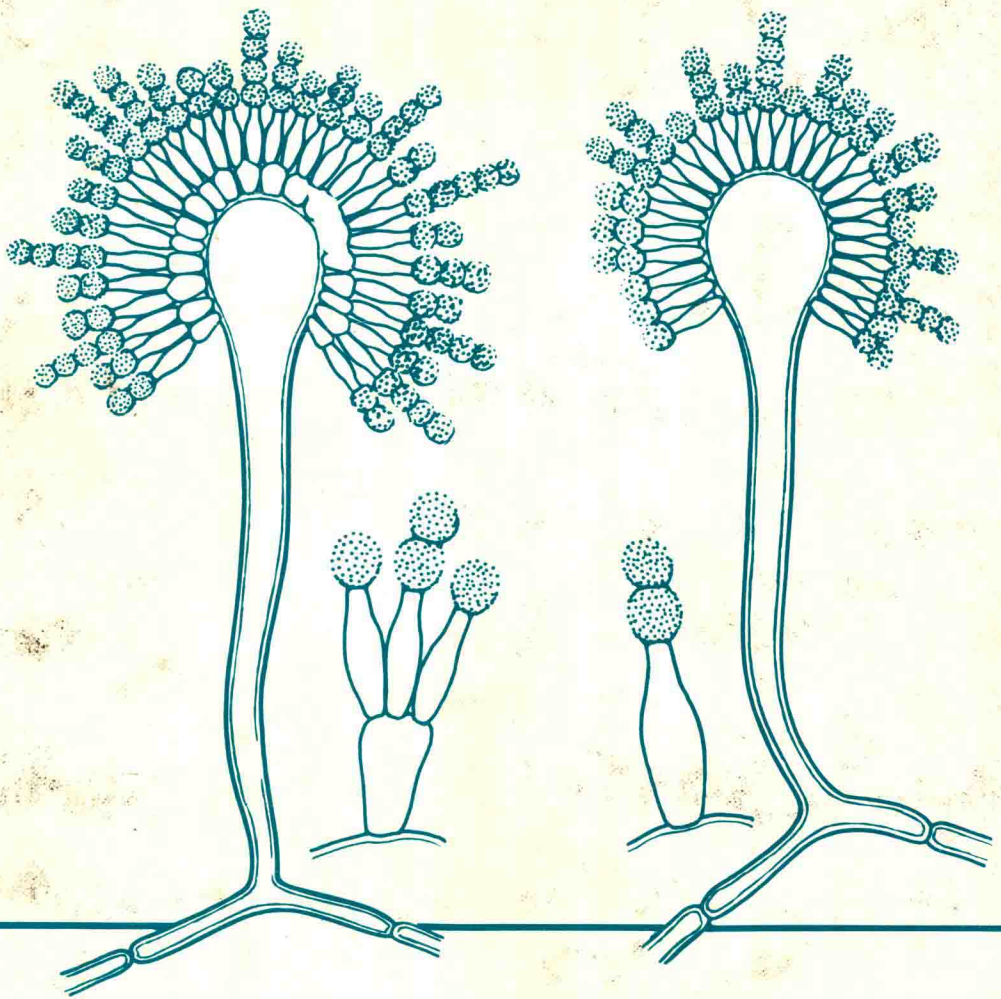


BIODETERIORATION RESEARCH 1



Edited by
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PREFACE

The present volume contains the majority of the papers presented at the First Pan-American Biodeterioration Society Annual Meeting held at The George Washington University, Washington, D.C., USA, on July 17, 18, and 19, 1986. The organization and resultant program were born of ideas primarily conceived by H.O.W. Eggins from Bioquest, UK and C.E. O'Rear, USA. The sponsors for the first meeting included The George Washington University, The Smithsonian Institution and The Virginia Department of Health. The program was organized by members of the Program and Planning Committee. They invited leading scientists in specific topic areas and accepted contributed papers from individuals and laboratories actively involved in relevant areas of research and study. The Society (PABS) thus ensured that the program reflected current developments, informed reviews, embryonic and developing areas, and critical assessment for several aspects of the present state of knowledge as it relates to the five major sections of the proceedings.

All the papers and presentations underwent both scientific and technical review. A few papers do not appear in the volume because they were judged not suitable for publication. The order and organization of the contributions vary somewhat from that of the actual meeting session.

This book is the results of the efforts of the Program and Planning Committee, section organizers, PABS co-program chairmen, session chairpersons, session co-chairpersons, authors, and those behind the scene assistants listed in Acknowledgments and Appreciations. This publication is considered to be a general contribution to the broad science of biodeterioration. Also, with many of the papers associated with mycotoxins, the newly born PABS completed the cycle some 20 years later since this topic was predominant at the earlier and newly developing parent, The International Biodeterioration Society in the United Kingdom.

The international aspect of this book and meeting is supported by authors and/or participants representing six nations. Participants

primarily represented North America and South America, therefore quite appropriately complementing PABS, the Pan-American name sake.

We believe these reviewed and edited proceedings will be of value to a broad range of scientists.

The Editors

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CONTENTS

Introduction and Overview

The Impact of Biodeteriogens On Human Health, Economics,
Quality of Life, and The Arts

G. C. LLEWELLYN 1

SECTION I

Biodeterioration and Biodegradation of Synthetic Materials and Structures of Biological Origin

Introduction

W. V. DASHEK 5

Effect of the Soil Environment on the Biodeterioration of
Man-Made Textiles

D. M. NORTHROP and W. F. ROWE 7

Characterization of an Extracellular Polyester Depolymerase of
Cryptococcus laurentii

J. A. CAMERON and A. S. COSTA 17

Bacterial Counts on Commercial U.S. Cotton Fiber and Their
Possible Relation to Byssinosis in Cotton Mills

M. E. SIMPSON and P. B. MARSH 25

Effects of Differences in Areas of Growth and Plant Varieties
on Endotoxin Contamination of Airborne Dusts from Carded
Cottons

S. A. OLENCHOCK and R. M. CASTELLAN 35

Attempts to Determine Whether the Products of Extracellular
Polyphenol Oxidase Modulate the Catechol-Induced Bimodal
Growth Response of Coriolus versicolor

R. TAYLOR, W. V. DASHEK, W. C. SHORTLE, J. E. MAYFIELD,
and G. C. LLEWELLYN 43

Time-Dependent Appearance of Extracellular Polyphenol Oxidase in Relation to Catechol-Induced Bimodal Growth Response of <u>Coriolus versicolor</u>	
R. TAYLOR, G. C. LLEWELLYN, J. E. MAYFIELD, W. C. SHORTLE, and W. V. DASHEK	63
Resistance of Some Woods From Africa and Southeast Asia to Neotropical Wood-Destroyers	
J. D. BULTMAN, R. H. BEAL, and F. F. K. AMPONG	75
Biodeterioration of Hair in a Soil Environment	
J. M. SEROWIK and W. F. ROWE	87

SECTION II

Mycotoxins As Biodeteriogens and Mycotoxin Biodegradation

Introduction	
G. C. LLEWELLYN	97
Field Contamination of Sorghum With Zearalenone and Deoxynivalenol in North Carolina: Density Segregation to Remove Mycotoxins	
M. BABADOOST, W. M. HAGLER, JR., D. T. BOWMAN, AND P. E. NELSON	99
Analysis of Venezuelan Corn for Aflatoxin and <u>Aspergillus</u> <u>flavus</u> or <u>Aspergillus parasiticus</u> Contamination	
A. J. MARTINEZ, M. W. TRUCKSESS, and D. L. PARK	111
The Level of Toxigenic Fungi in 1985 Maryland Corn Before and During Storage	
S. TROFA, H. Y. ALY, and G. A. BEAN	119
Myrotoxins Produced by <u>Myrothecium roridum</u> , a Fungus Pathogenic to Tomatoes	
G. A. BEAN and B. B. JARVIS	127
Slaframine and Swainsonine Production by <u>Rhizoctonia</u> <u>leguminicola</u> : Strain Comparison	
H. S. BARTLETT, M. E. WILSON, W. J. CROOM, JR., and W. M. HAGLER, JR.	135
Evaluating Illicit Marihuana for Aflatoxins and Toxigenic Fungi	
A. S. KRAWCZENIUK, C. E. O'REAR, P. B. MISLIVEC, V.R. BRUCE, M. W. TRUCKSESS, and G. C. LLEWELLYN	149
An Evaluation of Four Mycological Media for Enumeration of Mold and Yeast in Grains and Seeds	
A. J. MARTINEZ and R. A. ALVARADO	165

Production of Aflatoxins on Baking Potatoes	
G. C. LLEWELLYN, C. E. O'REAR, and W. V. DASHEK,	175
<u>Pencillium oxalicum</u> and Secalonic Acid D in Fresh Corn	
M. S. PALMGREN and D. S. FLEISCHHACKER	193
Probable Aflatoxin B ₁ -Induced Alterations in <u>Triticum spp.</u>	
"cvs"., Seedling Organ Elongations and ⁶⁵ Zn-ZnCl ₂	
Uptake/Distribution	
G. C. LLEWELLYN, J. D. REYNOLDS, C. E. O'REAR, and W. V.	
DASHEK	197
Phytotoxic Effects of Trichothecene Metabolites From	
Pathogenic Strains of <u>Myrothecium roridum</u> on <u>Cucumis melo</u> L.	
J. O. KUTI, T. J. NG, and G. A. BEAN	213
Biodeterioration of Aflatoxin B ₁ in Various Soils	
J. S. ANGLE	223
Thermal Detoxification of Trichothecene Contaminated	
Commodities	
H. M. STAHR, G. D. OSWEILER, P. MARTIN, M. DOMOTO and	
B. M. DEBEY	231
Alteration of Seedling Germination and Amine Levels by Two	
Mycotoxins	
L. B. WEEKLEY, C. E. O'REAR, and G. C. LLEWELLYN	239

SECTION III

General Biodeterioration and Biodegradation

Introduction	
C. E. O'REAR	253
Microbial Ecology of an Automotive Engine Plant	
H. W. ROSSMOORE, L. A. ROSSMOORE, and C. E. YOUNG.....	255
Susceptibility to Microbial Contamination of Fire-Resistant	
Invert-Emulsion Hydraulic Fluids	
G. ANDRYKOVITCH and R. A. NEIHOF	269
Protective Action of <u>Serratia marcesens</u> in Relation to the	
Corrosion of Aluminum and Its Alloys	
H. A. VIDELA and P. S. GUIAMET	275
Protection of Keratinous Materials With Synthetic Pyrethroid	
Insecticides	
R. E. BRY	283

SECTION IV

Biodeterioration Research For the Conservation of Art and Antiquity in Libraries, Museums, and the Outdoors

Introduction

A. W. POSTLETHWAITE 293

Preliminary Scanning Electron Microscopy Study of

Microbiologically Induced Deterioration of High Alkali

Low-Lime Glass

R. J. KOESTLER, E. D. SANTORO, L. RANSICK, R. H. BRILL,
and M. LYNN 295

The Role of the Odd Beetle, Thylodrias contractus, in the Biodeterioration of Museum Objects

G. D. ALPERT 309

A Note on the Reaction of Methyl Tri-Methoxy Silane to Mixed Cultures of Microorganisms

R. J. KOESTLER, E. D. SANTORO, F. PREUSSER, and
A. RODARTE 317

A New Approach to Treating Fungus in Small Libraries

W. R. CHAMBERLAIN 323

SECTION V

Chitin and Lignocellulose Biodeterioration and Biodegradation

Introduction

R. A. SMUCKER 331

Bacterial Chitinases and Their Role in the Mineralization Processes

C. E. WARNES 333

Recovery of Vibrios From Coastal Waters - Involvement of Chitin

R. K. GUTHRIE, and D. Q. COFIE 339

Chitinase Induction in an Estuarine System

R. A. SMUCKER and C. K. KIM..... 347

Modeling the Persistence of Lignocellulosic Detritus in Wetland Ecosystems

R. E. HODSON, M. A. MORAN, and R. BENNER 357

Participants and Addresses	375
Author Index	379
Subject Index	381

INTRODUCTION AND OVERVIEW

The Impact Of Biodeteriogens On Human Health, Economics, Quality Of Life, And The Arts

Change, albeit slow paced and almost invisible at times and drastically evident at other times, appears to be a fundamental concept associated with the biotic and abiotic components of the earth. Extra terrestrial data seems to complement this observation also. One could discuss entropy, equilibrium, and enthalpy but our interest centers primarily about breakdown or alteration of matter, in particular bio-breakdown. Biodeterioration would be by our definition, the undesirable change, usually caused by microorganisms but not exclusively so. Although fungi and bacteria are often the prime actors in biodeterioration, other organisms such as plants, invertebrates, insects, birds, rodents, and at times even the chemicals in air or water are often included as part of this broad, multi-disciplinary topic. Biodegradation, not to be excluded, but often separated by the "purist" concerns, in my belief, a planned and purposeful breakdown or alteration due to organisms and at times even by chemicals.

Biodeterioration and biodegradation influence most aspects of our lives. This begins with the effects relevant to public health issues, such as the changes in water, food, feed, and our direct environment. Health hazard control is very important. Toxic substances, hazardous waste, and infectious agents support this importance. It, biodeterioration, continues and includes a linkage to economics as well as with the survival and quality of our material objects. This varies from clothing to buildings, to transportation modes including structures, and fuels, to medicinals, and pharmaceuticals, and to xenobiotics.

Often lost in the important aspects of health and economics is the deterioration of objects of art, problems seen in our archives, and damage in museums. The undesirable biodeterioration of such irreplaceable

materials and treasurers is of the ultimate importance. The preservation of statues and archeological objects is needed.

It is evident that biodeterioration topics include corrosion, insects and pesticides, agricultural storage of crops, water quality, forensic science evidence, cell wall breakdown there are even some colleagues who include the effects on organisms, their resultant chemicals, xenobiotics, ... on the human as a biodeterioration process and in the case of chemical biological warfare agents (the nerve gases and the alleged use of T-2 mycotoxin) as biodegradation.

The major biodeteriogens discussed in the proceedings include: Toxigenic occurrence of fungal metabolites in food and feeds as well as efforts to control toxin production and detoxifying the biodeteriogens, i.e., mycotoxins. Deterioration of man-made and synthetic fibers including cotton, wood, forensic science evidence, and the relevant health-related aspects. Controlling biodeterioration in museum materials and objects of art is included also. The General Biodeterioration Section includes biodeteriogens influencing hydraulic fluids, corrosion

The above four major section topics plus general biodeterioration serve as the organizational basis for the scientific reports to follow. Although few if any scientists would consider him/herself to be a biodeteriologist, the nurturing of this post-embryonic field, biodeteriology, with all its multi-disciplinary overtones, does have substantial developments to share and exchange. It is essential that they be communicated from this point of view so that those involved in the aspects of these sub-areas can mutually benefit. Therefore, herein are presented recent data reports and some review summaries by biodeteriologists, as they relate to economics, conservation and preservation, and public health concerns.

Gerald C. Llewellyn, Ph.D.
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SECTION I

BIODETERIORATION AND BIODEGRADATION OF SYNTHETIC MATERIALS AND STRUCTURES OF BIOLOGICAL ORIGIN

